Third Grade Math Lesson Materials

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Foundations of Multiplication and Division

G3 U1 Lesson 1

Model equal groups and use groups of language

CITYTUTOR DC

G3 U1 Lesson 1 - Students will model equal groups and use "groups of" language.

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): Today we will begin our unit on multiplication and division. The most important thing to know about multiplication and division is that they both use "equal groups." You've been learning about the meaning of the word "equal" since kindergarten. So today may seem like a review of some math that you already know. That's okay though, because if you get really good at using equal groups, you'll be really good at multiplication and division.

Let's Talk (Slide 3): So, let's start with a question…**what does it mean to have equal groups? Can you give an example of equal groups in real life?** Possible Student Answers/Key Points:

- Equal groups are groups that are the same.
- Equal groups have the same amount of items/stuff/objects/things in every group.

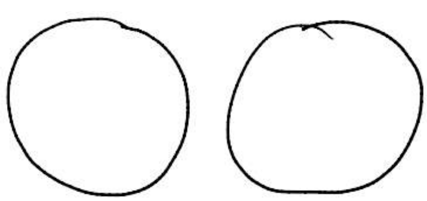
Correct! Equal groups are when every group has the same amount inside. Now that we know that equal groups are when every group has the same amount in each group, can you draw me an example of equal groups? Yes! Those are equal groups because every group has the same amount.

Let's Think (Slide 4): Let's just make absolutely sure you know what equal groups are. Take a look at the model on this page. Are these groups equal? Why or why not? No, the groups are not equal. One group has more objects in it than the other group. **Right, so how would we make the groups equal?** Possible Student Answers/Key Points:

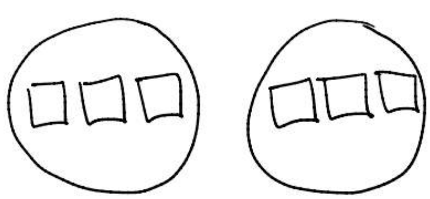
- Add three more squares to the second group.
- Take three squares away from the first group.

Why does that make the groups equal? Now both groups have 4/1 square(s) inside. Great job, the groups did not start off equal. However you added squares to the group that had less/took squares away from the group that had more. Now both groups are equal because both groups have the same amount of square(s). Let's point and count, we have 1 group of 4 and 2 groups of 4.

Let's Think (Slide 5): Let's use what we know about equal groups to solve the problem on this slide. It says model 2 groups, with 3 in each group. Let's pause. What does it mean to model? Draw a picture! Correct, so we need to draw a picture of 2 groups, with 3 in each group. How should we begin our drawing/what should we do first? Draw 2 groups.

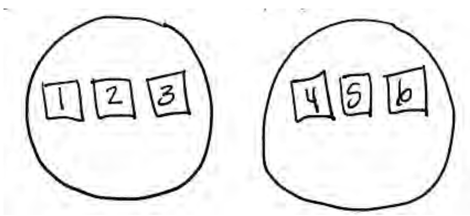


Correct, we need to draw two large groups. You can hear "two groups" when you read that sentence. Listen, "TWO GROUPS of three." So that tells me how many groups to draw. Watch me, I'm going to draw 1 group (*draw a circle*) and another group (*draw another circle*). These groups are going to have things in them so I'm going to make them big enough, like baskets to hold things!



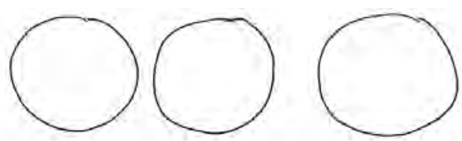
Hmm, so let's go back and read that sentence, "TWO GROUPS, we did that (*point to each group*) WITH THREE IN EACH GROUP." So what should we do? Draw 3 circles/stars/squares/swirls in each group! That's right, we need to put 3 objects or items into each group. So I need to draw three here (*draw three in the first group*) and another three here (*draw three in the second group*). Now look, I have two groups with three in each. Here's 1 group with 3 in it and here's another group with 3 in it so that makes 2 groups of 3.

There's one more question that says, "What's the total?" Do you know what the word total means? The total means "how many there are altogether."



Correct, total means, "in all." So how would we find the total circles/squares/swirls/stars? Count them all up! That's right! If we want to know the total we can count them all up. We just count the items that are in the groups, not the groups. Just like if I was counting the total amount of skittles in a bag, I wouldn't count the bag, just the skittles IN the bag. So, for today let's count them all up by ones. It's slow, but we will make fewer mistakes. Let's count out loud. As we count, I'll label each square. Ready, 1, 2, 3, 4, 5, 6. So, what's the total? 6!

Let's Think (Slide 7):   Let's try another. This one says "model 3 groups of 2." This one looks a little different than the last one. I see a 3 and 2 but it looks a little different so let me look carefully. It says, "3 groups of 2." Well, 3 groups of 2 means the same things as 3 groups with 2 in each group. It's just a shorter way of saying it.



What should we do first? Draw 3 groups! That's right, it says "3 groups" so we'll draw 3 big groups, like bags or baskets. That way we have room to put things in them! Count with me…1 group, 2 groups, 3 groups, now we have 3 groups.

What do we do next? Draw 2 in each group! So, I'm going to put 2 in this group, another 2 in this group, and another 2 in this group (*draw 2 in each group as you narrate*). There, I have three groups…1, 2, 3 (*point to each group*)…there are 2 in EACH group..1, 2…1, 2…1, 2 *(point to each star)*.

Now we need to find the total. What can we do? Count by ones, count them all! Count with me as I point…1, 2, 3, 4, 5, 6. So, what's the total? 6!

Let's Talk (Slide 8):   Now we just drew two different models. Ours looks similar to the ones on this slide. First we drew 2 groups of 3 and then we drew 3 groups of 2. Let's compare them. **What's different about the two models?** Possible Student Answers/Key Points:

- The first model has 2 groups but the second model has 3 groups.
- The first group has 3 in each group but the second group has 2 in each group.

What's the same about the models? Possible Student Answers/Key Points:

- Both have the numbers 2 and 3 (but in different ways/places).
- Both have a total of 6.
- The numbers (2 and 3) are just switched, but the total is the same.

Correct, the models do look different, the number of groups are different and the amount in each group is different. We switched the number of groups and amount in each group. But even though we switched the numbers, the total stayed the same. That's going to be really important to remember later on as we learn more about multiplication and division. You can switch the number or groups and number in each group, but still get the same total.

Let's Try It (Slide 9): Now let's work on modeling more groups together. Remember our groups need to be equal every single time.

WARM WELCOME

Today we will model groups using, “groups of” language.

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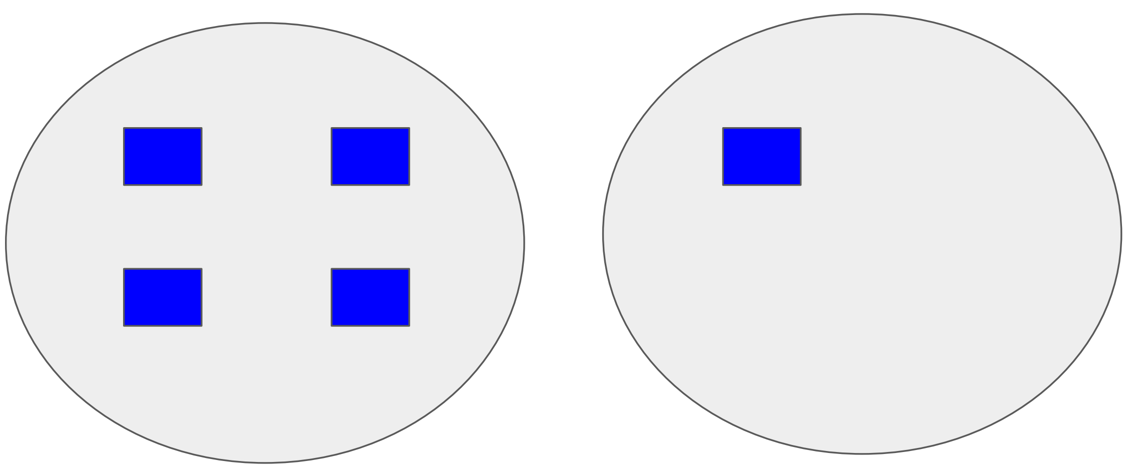
Let's Talk:

What does it mean to have equal groups?

Can you give an example of equal groups in real life?

Let's Think:

Make the groups equal.



Let's Think:

How would I model 2 groups, with 3 in each group?

What's the total?

Let's Think:

How would I model 3 groups of 2?

What's the total?

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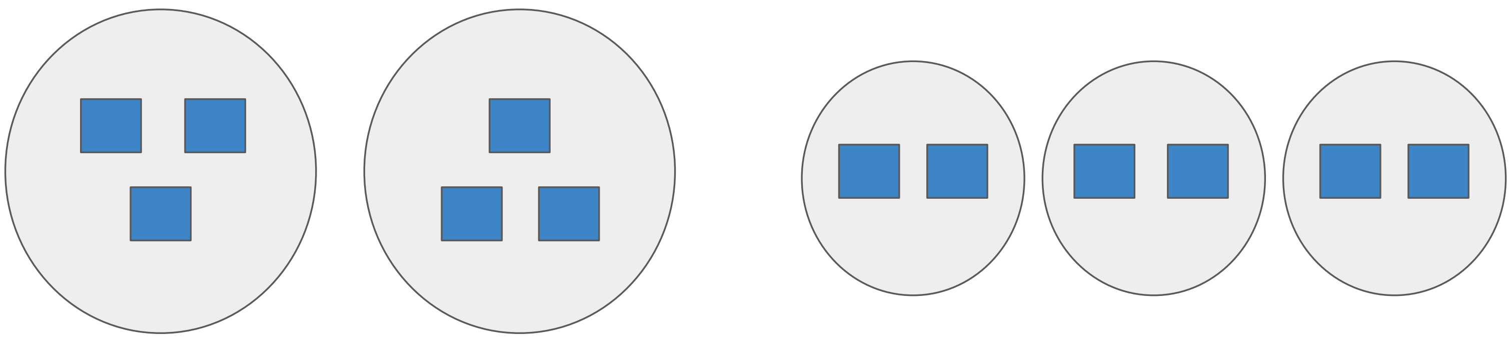
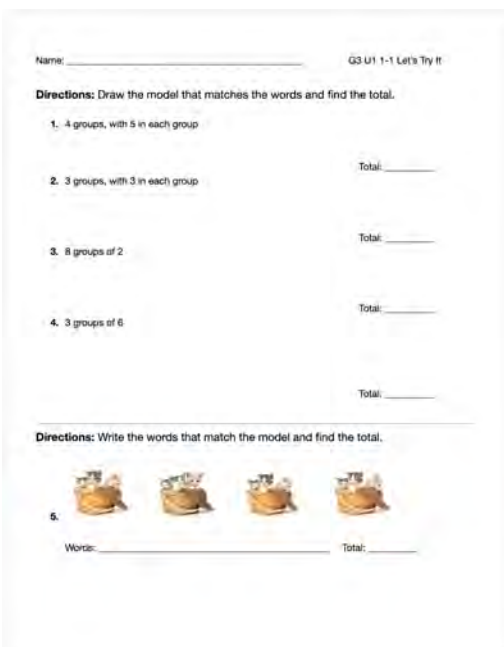
Let's Talk:

How are the two models different?
How are the two models the same?



Let's Try It:



Name: ______________________ G3 U1 1-1 Let's Try It

Directions: Draw the model that matches the words and find the total.

1. 4 groups, with 5 in each group

Total: ______

2. 3 groups, with 3 in each group

Total: ______

3. 8 groups of 2

Total: ______

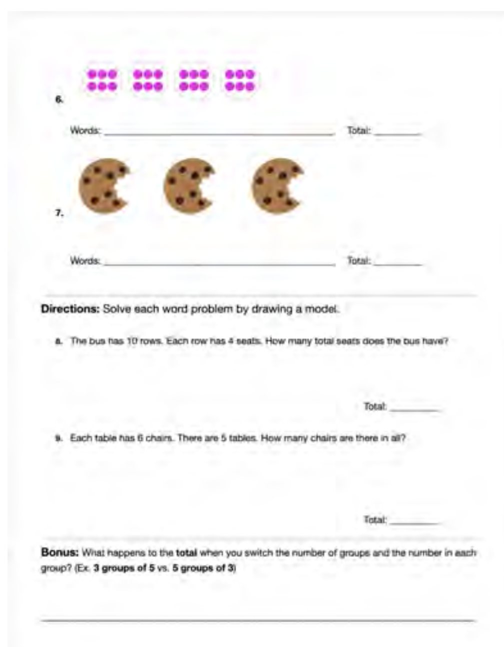
4. 3 groups of 6

Total: ______

Directions: Write the words that match the model and find the total.

5.

Words: ______________________ Total: ______



6.

Words: ______________________ Total: ______

7.

Words: ______________________ Total: ______

Directions: Solve each word problem by drawing a model.

8. The bus has 10 rows. Each row has 4 seats. How many total seats does the bus have?

Total: ______

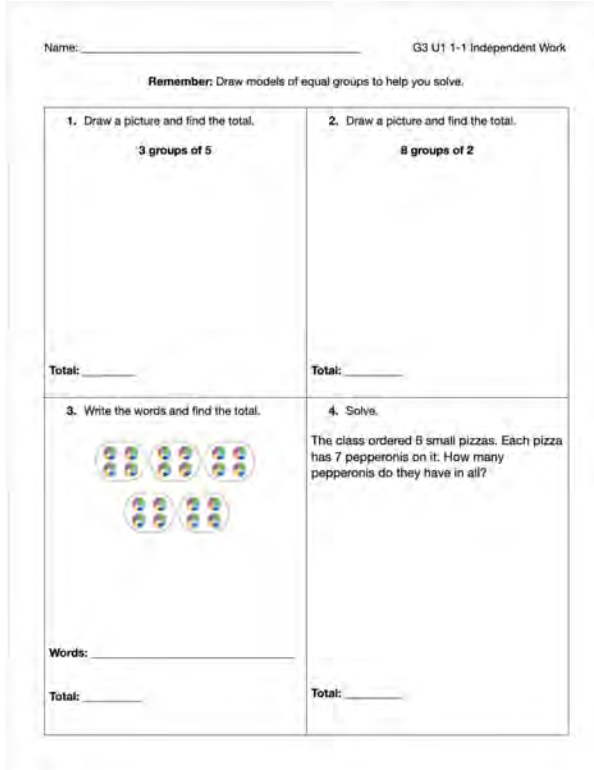
9. Each table has 6 chairs. There are 5 tables. How many chairs are there in all?

Total: ______

Bonus: What happens to the **total** when you switch the number of groups and the number in each group? (Ex. **3 groups of 5** vs. **5 groups of 3**)

____

On your Own:



Name: ________________________ G3 U1 1-1 Independent Work

Remember: Draw models of equal groups to help you solve.

1. Draw a picture and find the total. **3 groups of 5** **Total:** ______	**2.** Draw a picture and find the total. **8 groups of 2** **Total:** ______
3. Write the words and find the total. **Words:** ______________ **Total:** ______	**4.** Solve. The class ordered 8 small pizzas. Each pizza has 7 pepperonis on it. How many pepperonis do they have in all? **Total:** ______

Name: ____

Directions: Draw the model that matches the words and find the total.

1. 4 groups, with 5 in each group

Total: __________

2. 3 groups, with 3 in each group

Total: __________

3. 8 groups of 2

Total: __________

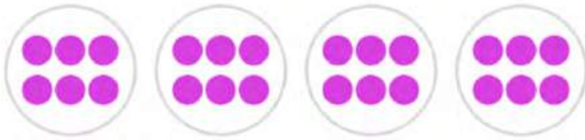
4. 3 groups of 6

Total: __________

Directions: Write the words that match the model and find the total.

5. 

Words: ____ Total: __________

6. 

Words: ______________________________________ Total: ________

7. 

Words: ______________________________________ Total: ________

Directions: Solve each word problem by drawing a model.

8. The bus has 10 rows. Each row has 4 seats. How many total seats does the bus have?

Total: ________

9. Each table has 6 chairs. There are 5 tables. How many chairs are there in all?

Total: ________

Bonus: What happens to the **total** when you switch the number of groups and the number in each group? (Ex. **3 groups of 5** vs. **5 groups of 3**)

____

Name: ______________________________________ G3 U1 Lesson 1 - Independent Work

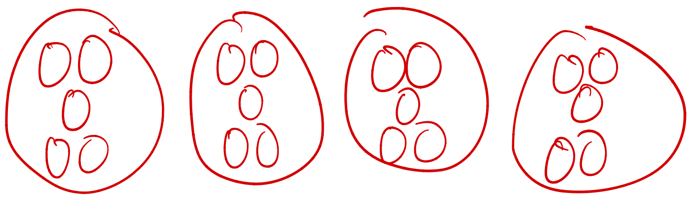
Remember: Draw models of equal groups to help you solve.

1. Draw a picture and find the total. **3 groups of 5** **Total:** ________	**2.** Draw a picture and find the total. **8 groups of 2** **Total:** _________
3. Write the words and find the total.  **Words:** ______________________________ **Total:** _________	**4.** Solve. The class ordered 6 small pizzas. Each pizza has 7 pepperonis on it. How many pepperonis do they have in all? **Total:** _________

Name: ______________________________

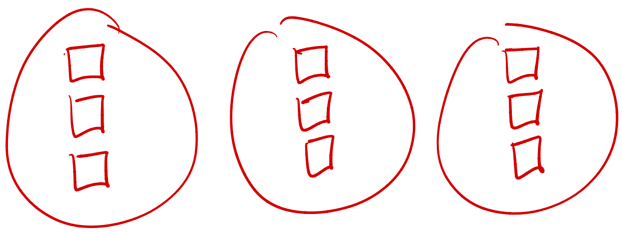
Directions: Draw the model that matches the words and find the total.

1. 4 groups, with 5 in each group



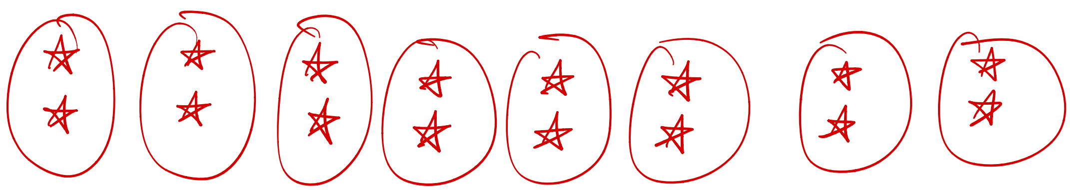
Total: 20

2. 3 groups, with 3 in each group



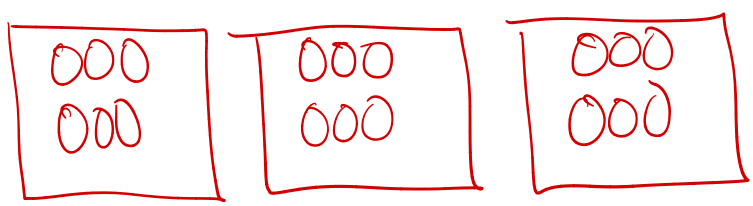
Total: 9

3. 8 groups of 2



Total: 16

4. 3 groups of 6

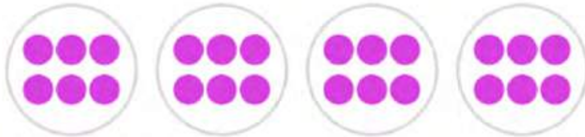


Total: 18

Directions: Write the words that match the model and find the total.

5. 

Words: 4 groups of 3 Total: 12

6. 

Words: 4 groups of 6 Total: 24

7. 

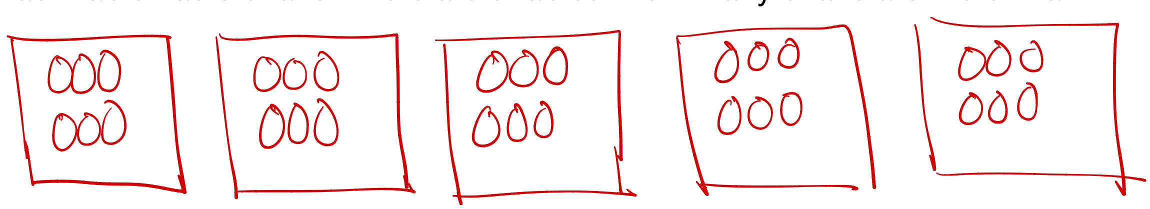
Words: 3 groups of 7 Total: 21

Directions: Solve each word problem by drawing a model.

8. The bus has 10 rows. Each row has 4 seats. How many total seats does the bus have?

Total: 40

9. Each table has 6 chairs. There are 5 tables. How many chairs are there in all?



Total: 30

Bonus: What happens to the **total** when you switch the number of groups and the number in each group? (Ex. **3 groups of 5** vs. **5 groups of 3**)

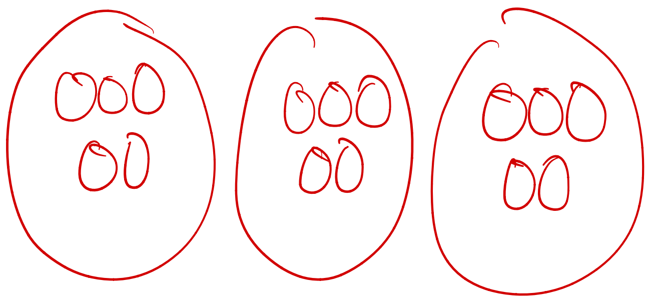
The total stays the same.

Name: ____________________ G3 U1 Lesson 1 - Independent Work

Remember: Draw models of equal groups to help you solve.

1. Draw a picture and find the total.

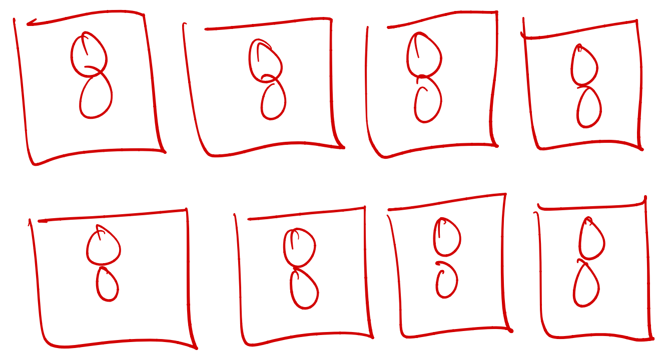
3 groups of 5



Total: 15

2. Draw a picture and find the total.

8 groups of 2



Total: 16

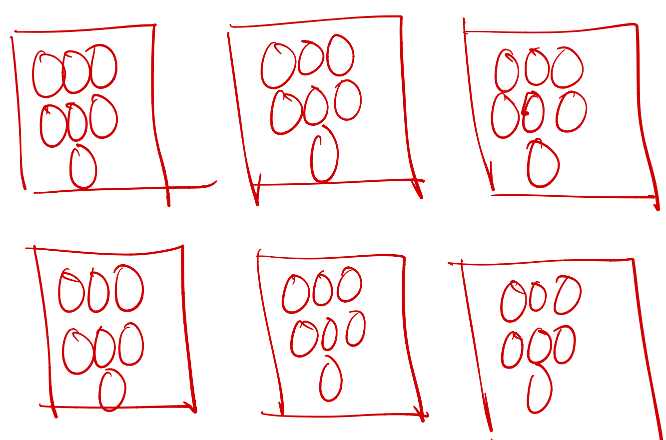
3. Write the words and find the total.

Words: 5 groups of 4

Total: 20

4. Solve.

The class ordered 6 small pizzas. Each pizza has 7 pepperonis on it. How many pepperonis do they have in all?



Total: 42

G3 U1 Lesson 2

Relate repeated addition to groups of language

G3 U1 Lesson 2 - Students will relate repeated addition to groups of language

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): Today we will continue our multiplication and division unit by learning about repeated addition. Yesterday we learned about equal groups and "groups of" language. Today we'll use what we learned about equal groups and "groups of" language to learn about repeated addition.

Let's Review (Slide 3): Let's quickly review what we went over yesterday. You see the figure below showing 3 groups of 2. What did we do yesterday to find the total squares? Count up all the squares. Correct! Let's quickly count all the squares together out loud: 1, 2, 3, 4, 5, 6. Correct, there are 6 total squares and we found the total by counting. More specifically, when we count "normally," we're actually counting by ones.

Let's Talk (Slide 4): Counting by ones is always a good way to find the total. However it might take a long time when we have more groups and more in each group. Imagine trying to count 10 groups of 9, it would take forever! Let's look at the model below. **Are there other ways to find the total?** Possible Student Answers/Key Points:

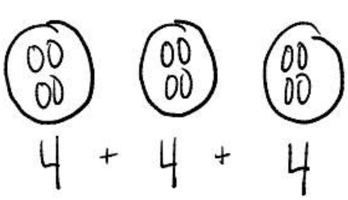
- Skip count by 2s … 2, 4, 6, 8. 8
- Add two groups together to get 4. Add 4 and 4 to get 8.
- Add each group together.

Guess what? You just did repeated addition without even knowing it! Repeated addition is when we add the same number over and over again. The number repeats itself…2 and then another 2 and then another 2 and then another 2. Today we're going to explore repeated addition as another way to represent equal groups like these…2 and 2 and 2 and 2! I'm going to show you how we write repeated addition to show equal groups and use it to find the total.

Let's Think (Slide 5): Today we're going to build on what we know about "groups of" with repeated addition. But first, let's start with what we learned yesterday. Let's draw a model to show 3 groups of 4.

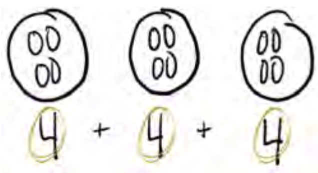
I'm going to draw 3 large groups because the sentence says THREE GROUPS. Next I'm going to put 4 in each group because the sentence says "three groups OF FOUR." Count with me as I put 4 in each group…1, 2, 3, 4… 1, 2, 3, 4… 1, 2, 3, 4. We have 4 and 4 and 4 (*point to each group*).

Now that we have a clear picture we can find the total. Yesterday we learned that we could count to find the total. But today we are going to use repeated addition to show the total.

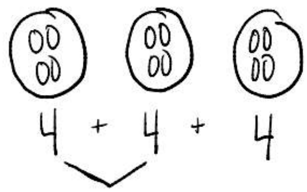


So I know that I have 4 *(point)* and 4 *(point)* and 4 *(point).* I'm going to write that as a repeated addition sentence below. I know the plus sign means the same as the word "and." So, 4 and 4 and 4 *(point to model)* is the same as 4 + 4 + 4 *(write)*. Read our number sentence out loud: 4 + 4 + 4 = ___. **What do you notice about our number sentence and our model?** Possible Student Answers/Key Points:

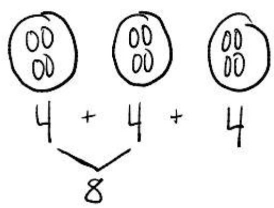
- The numbers that we're adding, match our picture above.
- Both show 3 groups with 4 in each group.



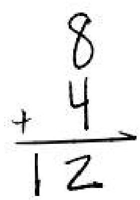
That's exactly right–repeated addition is another way to represent equal groups! Our number sentence represents, or matches, our picture. When I look at my number sentence I see that there are 3 fours! Here's 1 four, 2 fours, 3 fours (*circle each four as you count*).



But guess what? We're not done after writing our number sentence. Remember, the repeated addition is just another way for us to find our total. We still need to find the total! Let's start to add. Let's only add two numbers at a time. We'll start by adding the first 2 fours! There's one 4 left over that we'll come back to.

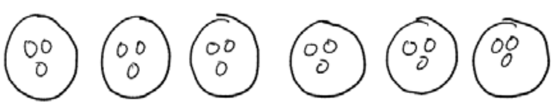


So we're adding 4 and 4, our doubles facts will help us. What does 4 + 4 equal? 8! Correct, 8! Now all we have to do is add our 8 to the 4 that is left. We need to solve 8 + 4.

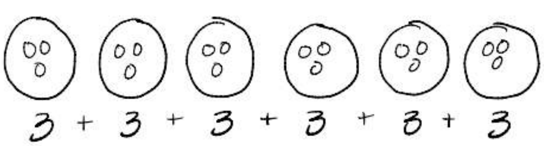


Let's stack and add just to show our work. What is 8 + 4? 12. Correct! Our total is 12. So, 3 groups of 4 equals 12 total.

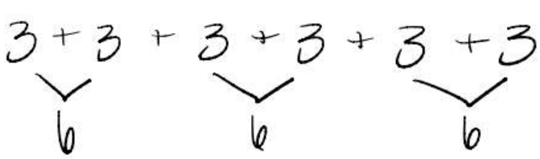
Let's Think (Slide 6): Let's try another one. This time we need to find the total of 6 groups of 3 using repeated addition. Again let's start with our model. Since we know how to draw models, I'm going to draw this one fast.



I'm going to draw 6 large groups, because it says 6 GROUPS: 1, group, 2, groups, 3, groups, 4, groups, 5 groups, 6 groups. Next I'm going to put 3 in each group. Count as I put three in each group…1, 2, 3…1, 2, 3…1, 2, 3… 1, 2, 3… 1, 2, 3… 1, 2, 3. Good, we have 6 groups with 3 in each group.

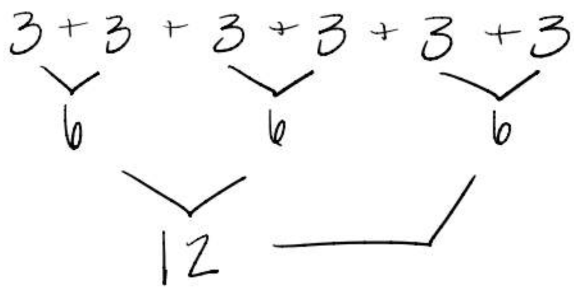


Now that we have a clear picture we can write our repeated addition number sentence. What's the number we're going to be adding over and over again? 3. Correct, we're going to be adding 3 over and over again because there are 3 in each group over and over again…three here and here and here (*point as you narrate*). So we're going to write 3 + 3 + 3 + 3 + 3 + 3 = _____.



Now let's go back and reread the number sentence. I want you to point to the figure as you say out loud what we're adding: 3 + 3 + 3 + 3 + 3 + 3. Correct, our repeated addition sentence matches our picture perfectly! We see 6 groups of 3! Remember, the repeated addition is another way for us to represent equal groups and find the total. Our picture shows 6 groups of 3 but our repeated addition also shows 6 groups of 3. Let's start adding.

Let's only add two numbers at a time. We'll add these two 3s, then these two 3s, then these two 3s. Our doubles facts will help us. What does 3 + 3 equal? 6. Correct, 3 + 3 is 6! So these 2 threes make 6 and these 2 threes make 6 and these 2 threes make 6! But we're not done adding, now we have all these 6s to add! Let's continue adding only 2 numbers at a time.



We'll add the first two 6s. We'll come back to the last 6 later. Now, what does 6 + 6 =? 12. Correct, 12. Now all we have to do is add 12 to our last 6. You pick your strategy to find the total!

So, what's 3 + 3 + 3 + 3 + 3 + 3? 18! Yes! 6 groups of 3 is 18 total!

Let's Try It (Slide 7-8): Now let's work on using repeated addition to represent our "groups of" language together. Remember, with repeated addition, the number that we're adding is the amount that's in each group.

WARM WELCOME

Today we will relate repeated addition to “groups of” language.

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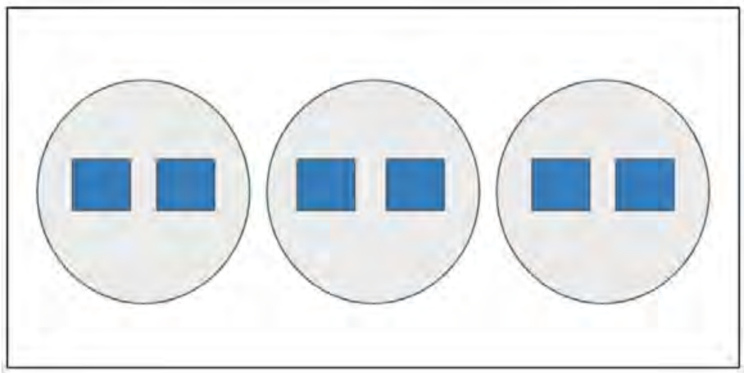
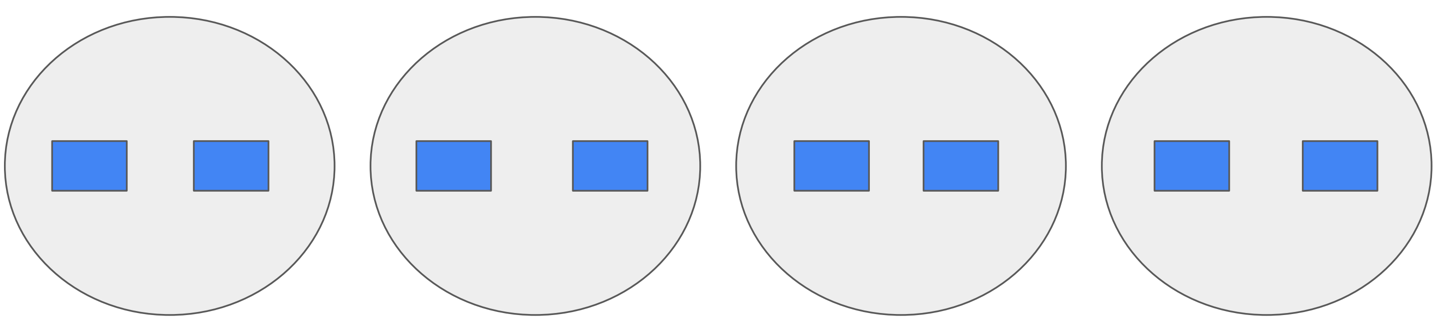
Let's Review:

How would I find the total of these equal groups?



Let's Talk:

What are some other ways to find the total?



Let's Think:

3 groups of 4

Find the total using repeated addition.

Let's Think:

6 groups of 3

Find the total using repeated addition.

Let's Try It:

Name: ____________________ G3 U1 1-2 Let's Try It

Directions: Write the repeated addition sentence that matches the words and find the total.

1. **3 groups, with 6 in each group**

   Repeated Addition: ____________________ Total: ________

2. **7 groups, with 2 in each group**

   Repeated Addition: ____________________ Total: ________

3. **5 groups of 4**

   Repeated Addition: ____________________ Total: ________

4. **4 groups of 11**

   Repeated Addition: ____________________ Total: ________

Directions: Write the words that match the repeated addition sentence and find the total.

5. **10 + 10 + 10 + 10 + 10 + 10**

   Words: ____________________ Total: ________

6. **9 + 9 + 9**

   Words: ____________________ Total: ________

7. **8 + 8**

   Words: ____________________ Total: ________

Directions: Solve each word problem by using repeated addition.

8. Kim bought 3 bags of cookies. There are 10 cookies in each bag. How many cookies did Kim buy?

   Total: ________

9. There are 10 party bags. Each bag has 4 treats inside. How many treats are there for the party?

   Total: ________

Bonus: Counting and repeated addition are two different ways of finding the same thing. What do they help you find?

____

On your Own:

Name: ____________________ G3 U1 1-2 Independent Work

Remember: You can use a model to help you with your repeated addition.

1. Write a repeated addition sentence and find the total. **4 groups of 2** **Repeated Addition:** ________ **Total:** ________	2. Write a repeated addition sentence and find the total. **6 groups of 5** **Repeated Addition:** ________ **Total:** ________
3. Use words to represent the repeated addition sentence and find the total. **3 + 3 + 3 + 3 + 3 + 3 + 3** **Words:** ________ **Total:** ________	4. Solve. Shawn put 8 cookies on each plate. There are 3 plates. How many cookies did she serve? **Total:** ________

Directions: Write the repeated addition sentence that matches the words and find the total.

1. **3 groups, with 6 in each group**

Repeated Addition: ____________________________ Total: _________

2. **7 groups, with 2 in each group**

Repeated Addition: ____________________________ Total: _________

3. **5 groups of 4**

Repeated Addition: ____________________________ Total: _________

Directions: Write the words that match the repeated addition sentence and find the total.

4. **10 + 10 + 10 + 10 + 10 + 10**

Words: ____ Total: _________

5. **9 + 9 + 9**

Words: ____ Total: _________

Directions: Solve each word problem by using repeated addition.

6. Kim bought 3 bags of cookies. There are 10 cookies in each bag. How many cookies did Kim buy?

Total: _________

Bonus: Counting and repeated addition are two different ways of finding the same thing. What do they help you find?

____

Name: ____ G3 U1 Lesson 2 - Independent Work

Remember: You can use a model to help you with your repeated addition.

1. Write a repeated addition sentence and find the total. **4 groups of 2** **Repeated Addition:** _______________________________________ **Total:** ________	**2.** Write a repeated addition sentence and find the total. **6 groups of 5** **Repeated Addition:** _______________________________________ **Total:** ________
3. Use words to represent the repeated addition sentence and find the total. $3 + 3 + 3 + 3 + 3 + 3 + 3$ **Words:** ________________________________ **Total:** _________	**4.** Solve. Shawn put 8 cookies on each plate. There are 3 plates. How many cookies did she serve? **Total:** _________

Name: ______________________________

Directions: Write the repeated addition sentence that matches the words and find the total.

1. 3 groups, with 6 in each group

6 + 6 + 6

12

$$\begin{array}{r} 12 \\ +\ 6 \\ \hline 18 \end{array}$$

Repeated Addition: 6 + 6 + 6 Total: 18

2. 7 groups, with 2 in each group

2 + 2 + 2 + 2 + 2 + 2 + 2

4 4 4 6

8

$$\begin{array}{r} 8 \\ +\ 6 \\ \hline 14 \end{array}$$

Repeated Addition: 2 + 2 + 2 + 2 + 2 + 2 + 2 Total: 14

3. 5 groups of 4

4 4 4 4 4

8 8

16

$$\begin{array}{r} 16 \\ +\ 4 \\ \hline 20 \end{array}$$

Repeated Addition: 4 + 4 + 4 + 4 + 4 Total: 20

Directions: Write the words that match the repeated addition sentence and find the total.

4. 10 + 10 + 10 + 10 + 10 + 10

20 20 20

40 60

Words: 6 groups of 10 Total: 60

5. 9 + 9 + 9

18

$$\begin{array}{r} 18 \\ +\ 9 \\ \hline 27 \end{array}$$

Words: 3 groups of 9 Total: 27

Directions: Solve each word problem by using repeated addition.

6. Kim bought 3 bags of cookies. There are 10 cookies in each bag. How many cookies did Kim buy?

10 + 10 + 10

20

30

Total: 30

Bonus: Counting and repeated addition are two different ways of finding the same thing. What do they help you find?

The total

Name: ____________________ G3 U1 Lesson 2 - Independent Work

Remember: You can use a model to help you with your repeated addition.

1. Write a repeated addition sentence and find the total.

4 groups of 2

2 + 2 + 2 + 2

4 4

8

Repeated Addition: 2 + 2 + 2 + 2

Total: 8

2. Write a repeated addition sentence and find the total.

6 groups of 5

5 5 5 5 5 5

10 10 10

20

30

Repeated Addition: 6 groups of 5

Total: 30

3. Use words to represent the repeated addition sentence and find the total.

3 + 3 + 3 + 3 + 3 + 3 + 3

6 6 6

12 9

$$\begin{array}{r} 12 \\ +\ 9 \\ \hline 21 \end{array}$$

Words: 7 groups of 3

Total: 21

4. Solve. Shawn put 8 cookies on each plate. There are 3 plates. How many cookies did she serve?

8 8 8

16

$$\begin{array}{r} 16 \\ +\ 8 \\ \hline 24 \end{array}$$

Total: 24

G3 U1 Lesson 3

Understand groups of language as multiplication

G3 U1 Lesson 3 - Students will understand groups of language as multiplication

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): We're two days into learning about multiplication but we haven't actually used the word multiplication or seen the multiplication symbol. I'm sure you've been wondering how everything we've been doing is connected to multiplication. Well today we're finally going to put it all together. You're going to see just how much you already know about multiplying.

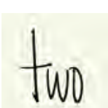
Let's Talk (Slide 3): In math, each symbol has a name and meaning. You already know two math symbols really well. What is the name of this first symbol? Plus sign! Correct, this is called the "plus" symbol or plus sign. What does the plus symbol mean? If I couldn't say "plus," what would I say instead if I read "3 + 4?" *(Write out 3 + 4)* Or how would I read it to someone who does not know what plus means? 3 and 4! That's right, the plus sign means we're joining two things. I would draw 3 circles and 4 more.

What is the name of this next symbol? Minus sign! And what does the minus sign mean? If I couldn't say "minus," what would I say instead if I read "4 - 3?" *(Write out 4 - 3)* Or how would I read it to someone who doesn't know what the minus symbol means? 4 take away 3! That's right, when we're subtracting we're taking away. If we draw out 4-3 we would draw 4 circles, then take away 3 of them. The minus sign means "take away."

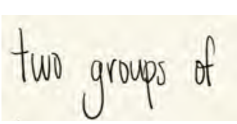
Let's Talk (Slide 4): You've probably seen this sign before. **What do you know about this symbol?** *(Allow students to share ideas.)* That's right, this is the multiplication symbol. Just like the symbols on the slide before, this symbol also has a name and a meaning. It's called the "times" sign. And guess what? You actually already know its meaning, we've been learning it the past two days. It means "groups of!" Over the past two days, every time we've used "groups of" language, drawn a picture using "groups of" or even used repeated addition to represent equal groups, we've actually been doing multiplication! Whenever we use equal groups to find the total, we are multiplying, let me show you.

Let's Think (Slide 5): We know that equal groups means that we have the same number in each group. We can represent equal groups using a picture, using *groups of* language, or using repeated addition. And today, we're going to explore how we use the multiplication sign to represent equal groups. Watch me.

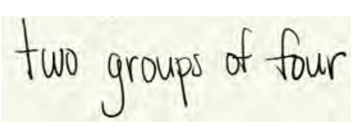
I want to represent 2 x 4 using words. We just learned that the X means groups of. So I can read this as, "2 times 4" or instead of "times," I can say "groups of!" So, "2 groups of 4"...and we've already been learning all about using that "groups of" language. So, I'm going to take each number or symbol and rewrite it as a word that has the same meaning.



I see the number 2 (*point to the number*) and I'm going to write that as a word. Two, t-w-o (*write as you narrate*), two. Do you see how both the word and the digit represent the number 2. They look different but have the same meaning, that's what a representation is, showing it differently, but keeping the meaning the same.



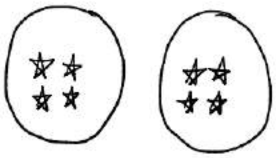
Next I need to rewrite this symbol *(point to the times symbol)* as words. Do you remember what this symbol means? Groups of! Correct it means groups of. So I have (*point to the "2 x"*) 2 GROUPS OF. I'm going to write the words "groups of" next to my word two.



Finally, I see the number 4 (*point to the number*) and I'm going to write that as a word. Four, f-o-u-r (*write as you narrate*), four.

Let's see. My original number sentence says 2 times 4. I know that times really means "groups of." So 2 x 4 really means 2 groups of 4. I've written a sentence in words that is the same as my multiplication number sentence. Now I need to represent 2 x 4 with a model. So I need to model 2 groups of 4, or 2 groups with 4 in each group.

With Pictures -



I'm going to begin by drawing 2 large groups because it says TWO GROUPS (*point to "2x"*). Here's one group… and two groups. They're both big enough to fill with objects. Next, I'm going to put 4 in each group because I need GROUPS OF FOUR *(point to the "x 4.")* Help me count 4 stars in each group. Ready, 1, 2, 3, 4… 1, 2, 3, 4. I have 2 groups *(point)*. There are 4 in this group and 4 in this group. So I have 2 groups of 4, just like my multiplication number sentence says and just like my sentence with words says.

With Repeated Addition -

4 + 4

Now I need to show 2 x 4 as repeated addition. Do you remember what 2 x 4 really means? 2 groups of 4. Right, we need to show 2 groups of 4 with repeated addition. 2 groups of 4 means I need to add 2 fours. Here's 1 four *(write 4)*, AND *(write plus sign)*, here's another four *(write 4)*. Let me check, I need 2 groups, I have a group here *(point to first 4)* and a group here *(point to second 4)*. My repeated addition represents 2 groups of 4.

Look! We just learned another way to represent equal groups! All three of these show 2 groups of 4. One way is to use "groups of" language, another way is to draw a model or a picture, another way is repeated addition and finally we learned that we can use the multiplication symbol! In multiplication, when we find the total, we can call the total the product. So, let's figure out what the product of 2x4…pick a strategy and say the total. It's 8! That's right, so the product of 2x4 is 8!

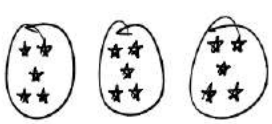
Let's Think (Slide 6): I'm going to show you another one and you can even call out the answers or steps if you know what I should do next. It says to represent 3 groups of 5. First it wants me to do it with a multiplication number sentence. I know if I'm writing a multiplication number sentence, I need to use the multiplication symbol. Do you remember what the multiplication symbol was called? Times. Correct, it's called times! Do you remember what the symbol means? Groups of!

With number sentence -

3 x 5

Now I'm ready to write my multiplication number sentence for 3 groups of 5. I'm going to write 3 because there are THREE GROUPS (*point to the 3*). Next I'm going to write the times symbol to represent GROUPS OF (*point to "groups of*). Finally I'm going to write 5 since there are groups OF FIVE (*point to the 5*). 3 x 5 is the same as 3 groups of 5.

With Pictures -



Now I'm going to draw my model to represent 3 groups of 5. . I'll start by drawing 3 groups because it says THREE GROUPS. One large group…two large groups…three large groups. Next, I'll draw 5 stars in each group because it says groups OF FIVE. Count with me: 1, 2, 3, 4, 5… 1, 2, 3, 4, 5… 1, 2, 3, 4, 5. There are 5 stars in every group. Let me check, I have 3 groups, 1, 2, 3, and there are 5 in every group, 5, 5, 5. My picture shows 3 groups of 5 just like my multiplication sentence and the sentence with words.

With Repeated Addition

5 + 5 + 5

Now I need to show 3 groups of 5 as repeated addition. Since I have groups of 5, I know I'll be repeating 5 again and again. Do you know how many 5s I'll add together to represent 3 groups of 5? 3! Correct, I'll need 3 fives since there are 3 groups. So I'll have one 5 and another 5 and another 5. I know I can use the plus sign to represent "and." So I'll have 5 + 5 + 5. This group is 5, this group is 5 and this group is 5 (*point*). My repeated addition sentence shows 3 groups of 5, just like my model, multiplication sentence and sentence with words.

Finally, let's find the total, or product, or 3x5. Pick a strategy to find the total. So, what's 3x5? 15! That's right, the product of 3x5 is 15!

Let's Try It (Slide 8): Now let's try representing our equal groups as multiplication together. Remember, our multiplication symbol is called the "times" sign and it means "groups of." Whenever we use equal groups to find the total, we're multiplying. That's true whether we use a picture, words, multiplication or repeated addition. And remember, you always find the total in multiplication whether you use a model, repeated addition or the times sign. In multiplication, there's a special word for the total, it's called the product. You'll see that word on your worksheet today. Just know when it says "product," they mean total.

WARM WELCOME

Today we will understand “groups of” language as multiplication.

Let's Talk:

In math, symbols have a meaning:

+ is called the _______ sign, it means ______________

− is called the _______ sign, it means ______________

Let's Talk:

What do you know about this symbol?

_____ X ______

X is called the _______ sign, it means ______________

Let's Think:

Represent **2 x 4**

With words -

With pictures -

With repeated addition -

Let's Think:

Represent **3 groups of 5**

With a multiplication number sentence -

With pictures -

With repeated addition -

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Let's Try It:

Name: ______________________________ G3 U1 1-3 Let's Try It

Directions: Fill in the table with the correct representation.

Multiplication	Picture	Words	Product
5 x 6			
3 x 7			
		8 groups of 4	
		4 groups of 2	

Multiplication	Picture	Words	Product
6 x 3			
		5 groups of 3	

Directions: Use a model or repeated addition to solve the word problem below.

The bus has 7 rows. There are 5 seats in each row. How many seats does the bus have?

Product: ________

Bonus: What are you looking for when you solve a multiplication sentence?

____

On your Own:

Name: ______________________________ G3 U1 1-3 Independent Work

Remember: Use a model or repeated addition to solve each problem.

1. Write the multiplication sentence in words, then find the product.

   4 x 2

   Words: ______________________

   Product: ______

2. Write the words as a multiplication sentence, then find the product.

   6 groups of 5

   Multiplication Sentence: ______________________

   Product: ______

3. Write the repeated addition sentence as a multiplication sentence, then find the product.

   3 + 3 + 3 + 3 + 3 + 3 + 3

   Multiplication Sentence: ______________________

   Product: ______

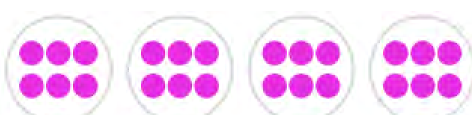
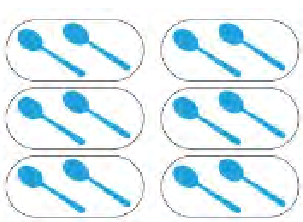
4. Represent the picture as a multiplication sentence, then find the product.

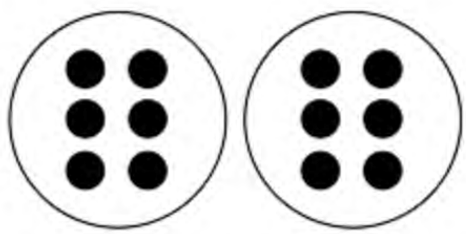
   Multiplication Sentence: ______________________

   Product: ______

Name: ______________________________________ G3 U1 Lesson 3 - Let’s Try It

Directions: Fill in the table with the correct representation.

Multiplication	Picture	Words	Product
5 x 6			
3 x 7			
		8 groups of 4	
		4 groups of 2	
			
			

Multiplication	Picture	Words	Product
6 x 3			
		5 groups of 3	
			

Directions: Use a model or repeated addition to solve the word problem below.

The bus has 7 rows. There are 5 seats in each row. How many seats does the bus have?

Product: __________

Bonus: What are you looking for when you solve a multiplication sentence?

Name: ______________________________ G3 U1 Lesson 3 - Independent Work

Remember: Use a model or repeated addition to solve each problem.

1. Write the multiplication sentence in words, then find the product.

4 x 2

Words:

____

Product: ________

2. Write the words as a multiplication sentence, then find the product.

6 groups of 5

Multiplication Sentence:

____

Product: ________

3. Write the repeated addition sentence as a multiplication sentence, then find the product.

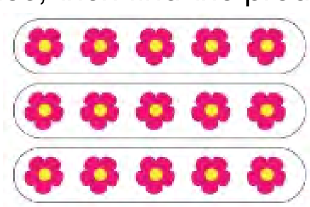
3 + 3 + 3 + 3 + 3 + 3 + 3

Multiplication Sentence:

____

Product: ________

4. Represent the picture as a multiplication sentence, then find the product.



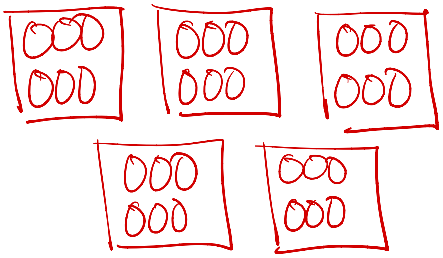
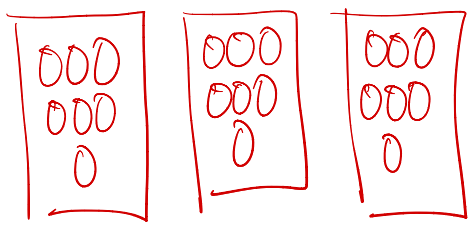
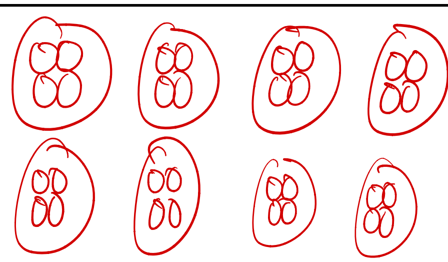
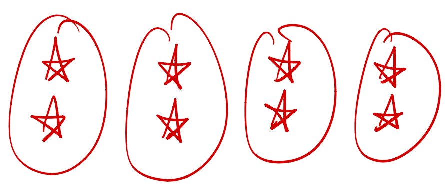
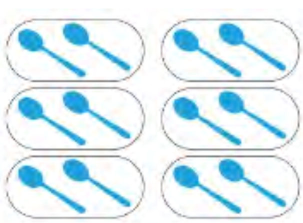
Multiplication Sentence:

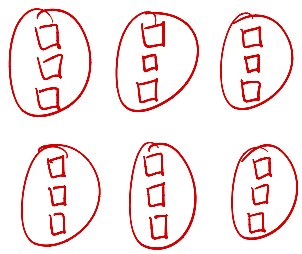
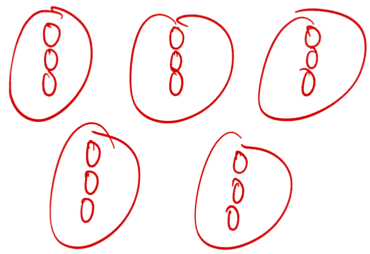
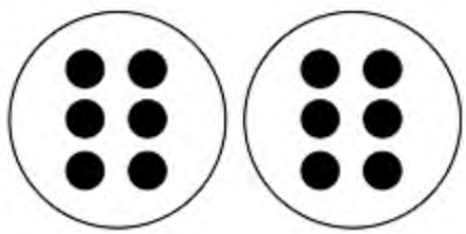
____

Product: ________

Name: ____ G3 U1 1-3 Let's Try It

Directions: Fill in the table with the correct representation.

Multiplication	Picture	Words	Product
5 x 6		5 groups of 6	30
3 x 7		3 groups of 7	21
8 x 4		**8 groups of 4**	32
4 x 2		**4 groups of 2**	8
4 x 6		4 groups of 6	24
6 x 2		6 groups of 2	12

Multiplication	Picture	Words	Product
6 x 3		6 groups of 3	18
5 x 3		**5 groups of 3**	15
2 x 6		2 groups of 6	12

Directions: Use a model or repeated addition to solve the word problem below.

The bus has 7 rows. There are 5 seats in each row. How many seats does the bus have?

5 5 5 5 5 5 5

10 10 10 15

20

$$\begin{array}{r} 20 \\ +\ 15 \\ \hline 35 \end{array}$$

Product: 35

Bonus: What are you looking for when you solve a multiplication sentence?

The total

Name: ______________________ G3 U1 1-3 Independent Work

Remember: Use a model or repeated addition to solve each problem.

1. Write the multiplication sentence in words, then find the product.

4 x 2

2 + 2 + 2 + 2

4 4

8

Words:

4 groups of 2

Product: 8

2. Write the words as a multiplication sentence, then find the product.

6 groups of 5

5 + 5 + 5 + 5 + 5 + 5

10 10 10

20

20
+ 10
30

Multiplication Sentence:

6 x 5

Product: 30

3. Write the repeated addition sentence as a multiplication sentence, then find the product.

3 + 3 + 3 + 3 + 3 + 3 + 3

6 6 6 9

18

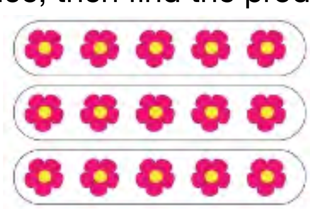
18
+ 9
27

Multiplication Sentence:

7 groups of 3

Product: 27

4. Represent the picture as a multiplication sentence, then find the product.



Multiplication Sentence:

3 x 5

Product: 15

G3 U1 Lesson 4

Relate multiplication to the array model

CITYTUTOR DC

G3 U1 Lesson 4 - Students will relate multiplication to the array model

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): We've learned so many different ways to show and solve multiplication. Let's take a couple minutes to review what we've learned.

Let's Review (Slide 3): **Let's list together everything we've learned about multiplication.** You go first, and I'll add anything you may forget. Possible Student Answers/Key Points:

- Multiplication uses equal groups.
  - Equal groups are groups with the same amount in each group.
  - We can show equal groups with a picture.
  - We can show equal groups with repeated addition.
- Multiplication finds the total.
  - We can find the total by counting.
  - We can find the total faster by using repeated addition.
- In multiplication, the total is called the "product."
- The multiplication symbol is called, "times;" it means "groups of."

Correct, we know all these things about multiplication. What I noticed is you named a bunch of ways to "represent" multiplication. We can do it with a picture of equal groups, repeated addition, and the times symbol. Today I'm going to show you another way to represent or show multiplication.

Let's Talk (Slide 4): These figures are called "arrays." You may have seen them before in second grade. The rows in an array go from side to side *(show movement)*. You try tracing some of the rows with your finger. **What do you notice about each array?** Possible Student Answers/Key Points:

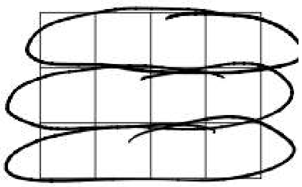
- Each row is the same.
- Each row is equal.
- The number of squares in each row is equal/the same.

Yes, each row in the array has the same number of squares in it! The first array has 3 rows with 4 in each row. Let's look at the array in the middle. Let's count the squares in each row out loud together: 1, 2, 3, 4, 5, 6… 1, 2, 3, 4, 5, 6… 1, 2, 3, 4, 5, 6… 1, 2, 3, 4, 5, 6. This array had 4 rows with 6 in each row.

Let's look at the last array on the right. Let's see if all the rows have the same number of squares. Count out loud with me: 1, 2… 1, 2… etc. How many squares were in each row? 2! This array had 8 rows with 2 in each row. It is true. Each row in an array is equal. The number of squares is the same in each row. What else have we been learning about where "each has the same amount"? Equal groups!

Right, we've spent the last 3 days showing equal groups with models, repeated addition and the times symbol. The rows in an array are just like the groups in our models because they are equal. Each row has the same number of squares just like each of our groups has the same number of circles/objects. We can use arrays as another way to represent multiplication since their equal rows are the same as equal groups.

Let's Think (Slide 5): Here we have one of the arrays from the previous slide. I'm going to represent it as a multiplication number sentence, with words and as repeated addition. Since I'm still getting used to using an array, I'm going to do something to make it more familiar.



I'm going to circle each row. I'm going to start at the beginning of the row and circle all the way to the end. Now I'm going to do it again for my second row and again for my third row. Now my rows look even more like groups and each group is full of squares. Let's point and count how many rows there are: 1 row, 2 rows, 3, rows. How many rows/groups do you see? 3 rows/groups. Correct, I circled 3 rows. Let's see how many are in each row. Let's count them out loud together. 1, 2, 3, 4… 1, 2, 3, 4… 1, 2, 3, 4. How many are in each row? 4 squares in each row. Correct, there are 3 rows of 4. Now I'm ready to complete my other representations.

I need to write a multiplication sentence. We just said there are 3 rows of 4. I don't have a symbol for "rows of." However, we said earlier that rows are just like groups. So, 3 rows of 4 is the same as 3 groups of 4. I know how to write 3 groups of 4 as a multiplication sentence.

3 x 4

I start with 3 because there are THREE rows or groups. The symbol for "groups of" is the times symbol*.* Finally there are FOUR in each group, 1, 2, 3, 4…1, 2, 3, 4…1, 2, 3, 4 *(point to each square as you count).* There are 3 *(point to each group)* groups of 4 (*run your finger over a row*) in my array. So this array shows 3x4.

three groups of four

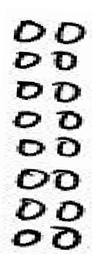
Now I need to represent my array with words. Let's look back at our array. How many groups do we have? Point to them and count them out loud. 1, 2, 3…3 groups. Correct, there are 3 groups. I'm going to write three groups in words. How many are in each group? Point to them and count them out loud. 1, 2, 3, 4…1, 2, 3, 4…1, 2, 3, 4. So, 4 in each group. Correct, there are 4 in each group. I'm going to add on "of four," since each group has 4.

4 + 4 + 4

Finally, I'm going to represent my array with repeated addition. I see 4 in each row. There are 4 and 4 and 4. I know I can use the plus sign to show "and." So I have 4 + 4 + 4. My number sentence has 3 fours and my array has 3 rows of 4.

Let's Think (Slide 6): This time I'm starting off with words and I have to represent them as an array, multiplication sentence and repeated addition. We've never drawn an array before and they can be tricky. I need to represent 8 groups of 2 with an array. I know rows and groups are the same. I also know with an array I use rows and I have to have the same number in each row.

If I have 8 groups of 2, how many are in each row or group? 2! Yes, that means each row has to be a row of 2! I'll start with a row of 2… 1, 2. I put 2 circles in a row, just like the arrays put squares in a row.



I only have 1 row here, how many rows am I supposed to have? 8 rows. Yes, 8 rows just like 8 groups! I need to draw more rows of 2. So I'm going to draw another row of 2…until I have 8 rows. Whew, now I have 8 rows or groups of 2. Let me check, 1, 2, 3, 4, 5, 6, 7, 8…8 rows and there are 2 in each row. Now I know you may be thinking, that's not an array, since it looks different from the other pictures. But it is an array. Arrays just need neat rows and the same amount in each row. We did that, so this is an array. It's also a lot easier to draw this kind of array instead of the other kind. Now let's finish the rest of this one.

8×2

Now, we need to write a multiplication sentence to represent 8 groups of 2. Well, we know the “groups of” symbol is the times sign. So I have EIGHT *(write 8)*, groups of *(write times sign)*, 2 *(write 2)*.

$2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$

Finally we need to write our repeated addition number sentence. We’re representing 8 groups of 2. That’s going to be a lot of twos, let’s make sure we keep track (*narrate as you write*). Let’s see, I needed 8 groups…1, 2, 3, 4, 5, 6, 7, 8 and each group has two…2, 2, 2, 2, 2, 2, 2, 2.

Let’s Try It (Slide 8): Now let’s work on using arrays to multiply together. Remember arrays are just like our equal groups pictures because each row has the same number in it.

WARM WELCOME

Today we will relate multiplication to the array model.

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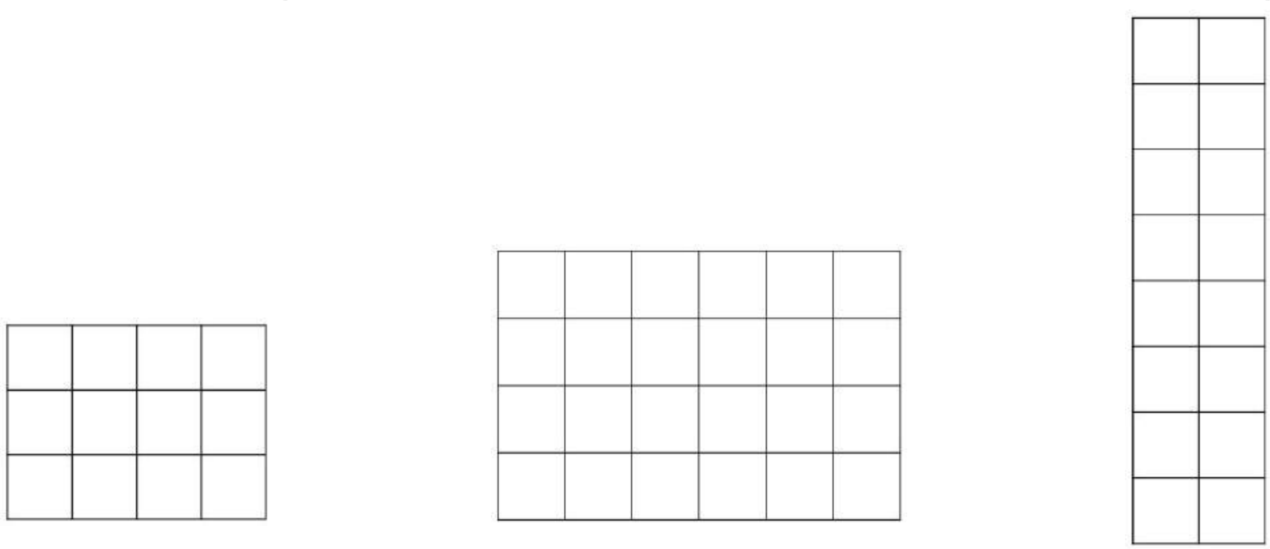
Let's Review:

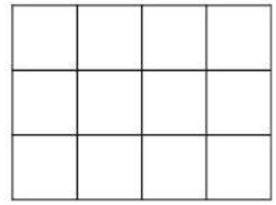
What have we learned so far about multiplication?

Let's Talk:

What do you notice about each array?



Let’s Think:

Represent 

With a multiplication sentence -

With words -

With repeated addition -

Let’s Think:

Represent **8 groups of 2**

With an array -

With multiplication sentence -

With repeated addition -

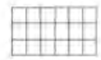
Let's Try It:

Name: ______________________ G3 U1 1-4 Let's Try It

Directions: Fill in the table with the correct representation.

Array	Repeated Addition	Words	Multiplication	Product
				
	5 + 5 + 5			
		4 groups of 4		
			3 x 6	

Directions: Write a repeated addition and multiplication sentence to represent the array below.



Repeated Addition: ______________________ Multiplication: ________________

Directions: Solve the story problem below. Use an array to help you solve.
Ms. Crews is setting up her classroom for the school year. She decides to arrange the desks into 7 rows. She puts 3 desks in each row.

a. Draw a picture of what Ms. Crews's classroom will look like.

b. How many students will Ms. Crews have in her class this year? ____________

Bonus:
Why can you use arrays for multiplication?

On your Own:

Name: ______________________ G3 U1 1-4 Independent Work

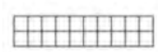
Remember: Use a model or repeated addition to solve each problem.

1. Represent the array with words, then find the product.

Words:

Product: ________

2. Represent the array with a multiplication sentence, then find the product.



Multiplication Sentence:

Product: ________

3. Draw an array to represent the repeated addition sentence below. Then find the total.

6 + 6 + 6

Product: ________

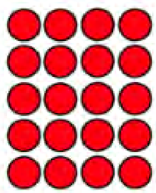
4. Draw an array to represent the multiplication sentence below. Then find the total.

3 x 3

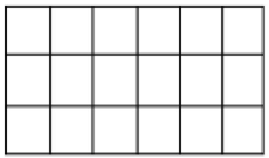
Product: ________

Name: ______________________________

Directions: Fill in the table with the correct representation.

Array	Repeated Addition	Words	Multiplication	Product
				
	5 + 5 + 5			
		4 groups of 4		
			3 x 6	

Directions: Write a repeated addition and multiplication sentence to represent the array below.



Repeated Addition: ________________________ Multiplication: _________________

Directions: Solve the story problem below. Use an array to help you solve.

Ms. Crews is setting up her classroom for the school year. She decides to arrange the desks into 7 rows. She puts 3 desks in each row.

a. Draw a picture of what Ms. Crews's classroom will look like.

b. How many students will Ms. Crews have in her class this year? ______________

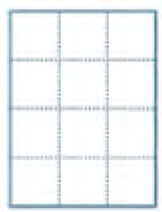
Bonus:

Why can you use arrays for multiplication?

Name: ____

Remember: Use a model or repeated addition to solve each problem.

1. Represent the array with words, then find the product.

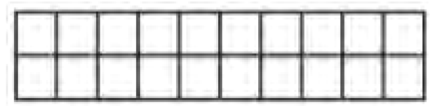


Words:

____

Product: ________

2. Represent the array with a multiplication sentence, then find the product.



Multiplication Sentence:

____

Product: ________

3. Draw an array to represent the repeated addition sentence below. Then find the total.

6 + 6 + 6

Product: ________

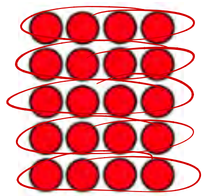
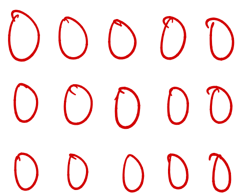
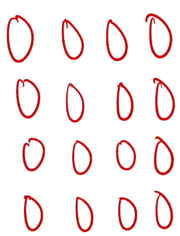
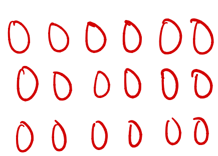
4. Draw an array to represent the multiplication sentence below. Then find the total.

3 x 3

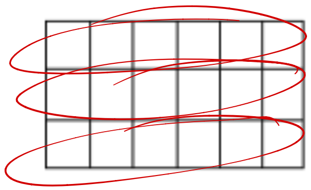
Product: ________

Name: ______________________________

Directions: Fill in the table with the correct representation.

Array	Repeated Addition	Words	Multiplication	Product
	4 + 4 + 4 + 4 + 4	5 groups of 4	5 x 4	20
	**5 + 5 + 5**	3 groups of 5	3 x 5	15
	4 + 4 + 4 + 4	**4 groups of 4**	4 x 4	16
	6 + 6 + 6	3 groups of 6	**3 x 6**	18

Directions: Write a repeated addition and multiplication sentence to represent the array below.



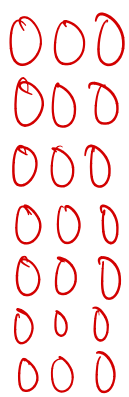
Repeated Addition: 6+6+6

Multiplication: 3x6

Directions: Solve the story problem below. Use an array to help you solve.

Ms. Crews is setting up her classroom for the school year. She decides to arrange the desks into 7 rows. She puts 3 desks in each row.

a. Draw a picture of what Ms. Crews's classroom will look like.



b. How many students will Ms. Crews have in her class this year? 21

Bonus:

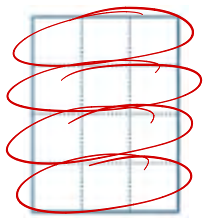
Why can you use arrays for multiplication?

The rows are the same as equal groups because every row has the same amount of squares.

Name: ____________________ G3 U1 1-4 Independent Work

Remember: Use a model or repeated addition to solve each problem.

1. Represent the array with words, then find the product.

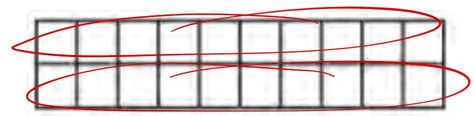


Words:

4 groups of 3

Product: 12

2. Represent the array with a multiplication sentence, then find the product.



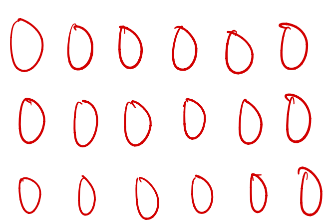
Multiplication Sentence:

2 x 10

Product: 20

3. Draw an array to represent the repeated addition sentence below. Then find the total.

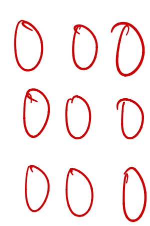
6 + 6 + 6



Product: 18

4. Draw an array to represent the multiplication sentence below. Then find the total.

3 x 3



Product: 9

G3 U1 Lesson 5

Split numbers to multiply

G3 U1 Lesson 5 - Students will split numbers to multiply

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): We've spent the past few days learning how to multiply. First we learned to multiply using a model and then we learned repeated addition as a more efficient way to also multiply. Let's quickly review all that we know about multiplying.

Let's Review (Slide 3): Try to fill in each blank with all you know about multiplication.

Let's Talk (Slide 4): In first and second grade, you learned how to break numbers into parts. **What are some ways you can break up the number 8?** Possible Student Answers/Key Points:

- 1 and 7
- 2 and 6
- 3 and 5
- 4 and 4
- 3 and 3 and 2

Correct, each time you broke up the number 8, you split it up into smaller numbers. However, your smaller numbers together, were always equal to 8. Never more, never less. Even though you used different numbers, it was still always 8. Today we will be splitting up numbers to multiply. Just like you did with 8, it's important to remember that our split up parts must be equal to our original whole.

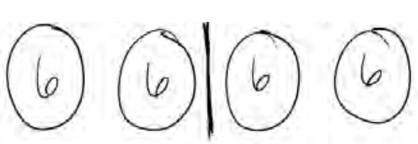
Let's Talk (Slide 5): As you've been learning to multiply, I'm sure you're starting to memorize some of the multiplication facts better than others. For example, it's easier to memorize the 2s facts because they're just like the doubles facts we learned in 1st and 2nd grade. It's also easier to figure out the 5s and 10s facts since you can skip count by 5s and 10s to solve them.

But there are still some facts that are hard to remember and also hard to solve because they're so big. It can take a really long time to draw out their models or finish solving their repeated addition. Today I'm going to show you how to split up bigger facts into smaller facts that are easier to solve. Let's start with a fact like 4 x 6. It's not a huge fact, but it might not be a fact you already have memorized.

What does 4 x 6 mean in words? 4 groups of 6. Correct, 4 x 6 really means 4 groups of 6.

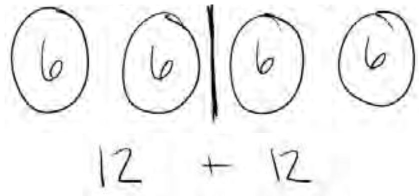
I'm going to start by drawing 4 groups of 6 quickly. I'm going to draw 4 groups. Then I'm going to put 6 in each group. I'm going to use the number to make it faster. So, now I have 4 groups of 6.

Now I don't know how much 4 groups of 6 is because I don't know my 4 facts really well. I'm going to split up my 4 groups the same way we split up those 8 circles. If I split them into smaller facts, I might be able to solve them more easily. I know I can split 4 up into 1 and 3. I can also split it up into 2 and 2.

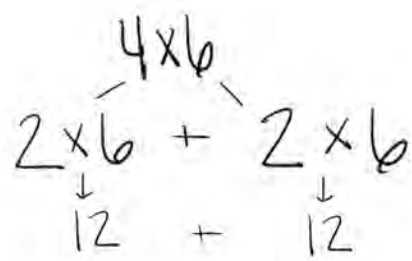


I'm going to split up my 4 groups into 2 groups here and 2 groups here *(draw line to show splitting of groups).* The reason I'm going to do this is because now, instead of 4 groups of 6, I have 2 groups of 6 and another 2 groups of 6 *(point)*. I know my 2s facts because they're just like my doubles facts! Before we solve, let's take a closer look at what I did.

Did I add any more groups after I drew my 4 groups of 6? No. No, I still have 1, 2, 3, 4 *(point)*, 4 groups. Did I add anymore in each group? No. No, I still have 6 in each group. All I did was change how we look at our 4 groups of 6. Now, let's see how much easier it is so solve this fact.



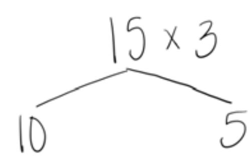
I know 2 x 6 is 12 because I know 6 + 6 is 12! So I have 12 over here and 12 over here. Now all I have to do is add 12 + 12. And, 12 + 12 is 24. So, 4 groups of 6 is equal to 24.



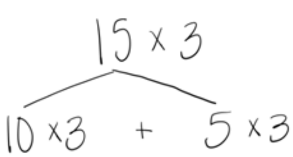
Let's write an equation that represents what we just did. We began with 4 groups of 6, which we can write as 4 x 6. Then we broke up our 4 groups of 6 into 2 groups of 6 and another 2 groups of 6. I know I can write 2 groups of 6 as 2 x 6. I know I can write "and" using the plus sign. So 2 groups of 6 and 2 groups of 6 is 2 x 6 + 2 x 6. Then we knew 2 x 6 was 12, so we had 12 and 12. Finally we added 12 and 12 and got our answer of 24. Now we have an equation that shows the work we did with our model.

We took a fact that we didn't know. We split up the groups in a way that formed smaller facts we did know. We solved our smaller facts. Then we put together their products and got the answer to the bigger fact we started with. This can be really tricky. Let's try another.

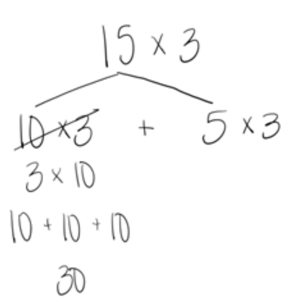
Let's Think (Slide 6): Let's solve 15 x 3. Now I definitely don't know my 15s facts. But I can split 15 up into facts I do know.



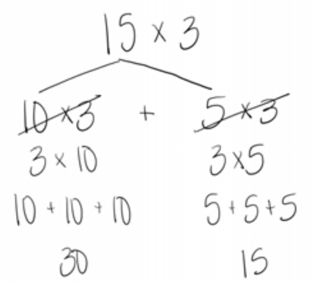
I'm going to split up 15 using the biggest fact that I know really well, 10 and 5. I know my 10s facts well because I can skip count by 10s. So, 10 and 5 make 15, I'm going to show that using my extra wide number bond.



I split my 15 groups into 10 groups and 5 groups. I started with 15 groups OF THREE. That means my 10 groups will have how many in each group? 3. Correct, 3. How many will be in each of my 5 groups? Also 3. Correct, the number in each group does not change. I split my 15 groups of 3 into 10 groups OF THREE *(write x3)* and 5 groups OF THREE *(write x3)*.



Now, I split my 15 groups this way because I know my 10s facts really well. I know 10 groups of 3 is the same as 3 groups of 10 *(cross out 10 x 3 and replace it with 3 x 10)*. And, 3 groups of 10 means 3 tens. That means 10 and 10 and 10 *(write 10 + 10 + 10 as you narrate)*. That's easy, skip count by 10s with me: 10, 20, 30 *(point as you count).*



I'm going to do the same thing on the right side. I'm going to switch my 5 groups of 3 to 3 groups of 5 since I can skip count groups of 5 *(cross out 5 x 3 and write 3 x 5)*. And, 3 groups of 5 is just 5 and 5 and 5 *(write as you narrate)*. Now I can skip count by 5s, count with me…5, 10, 15*!* So, 5x3 is 15.

Now I just need to add my two small totals to get my big total. I need to add 30 and 15 since those are the two parts of 15 that I split up. So, 30 + 15 is 45. 15 x 3 is 45. Wow, we just solved a huge multiplication fact using smaller facts we know!

Let's Try It (Slide 8): Let's try some together now. Remember, we can only split up the groups. We can't change how many are in each group or the total number of groups. That would end up changing our answer.

WARM WELCOME

Today we will split numbers to multiply.

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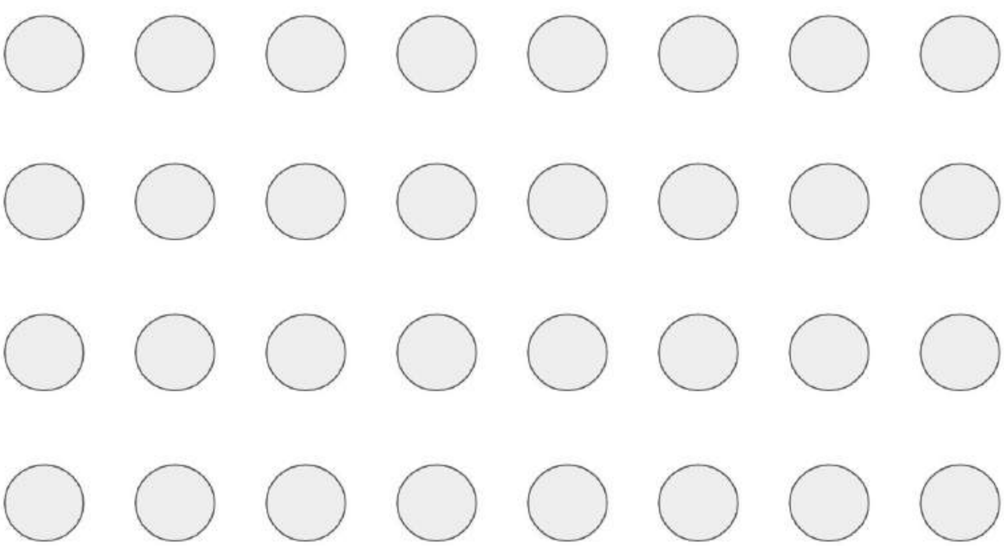
Let's Review:

- Multiplication uses _____ groups.
- We use multiplication to find the ______.
- The times symbol means _____.
- The addition symbol means _____.

Let's Talk:

What are all the ways you can break up the number 8?



Let's Talk:

Using facts you know, to solve facts you don't know.

4 x 6

Let's Think:

15 x 3

Let's Try It:

Name: ____________________ G3 Lesson 1-5 Let's Try It

Directions: Solve each multiplication problem by splitting the groups first into smaller facts.

1. 3 x 9 = ________	2. 4 x 5 = ________
3. 5 x 8 = ________	4. 6 x 7 = ________

Directions: Solve each multiplication problem by splitting the groups first into smaller facts.

5. 10 x 4 = ________	6. 7 x 5 = ________
7. 11 x 4 = ________	8. 12 x 8 = ________

When split facts to multiply, what must stay the same?

____

On your Own:

Name: ____________________ G3 Lesson 1-5 Independent Work

Remember: Solve each problem by first splitting up the groups. Then use a model or repeated addition if it helps.

4 x 7 = ________

12 x 9 = ________

Directions: Solve each multiplication problem by splitting the groups first into smaller facts.

1. 3 x 9 = __________	2. 4 x 5 = __________
3. 5 x 8 = __________	4. 6 x 7 = __________

Directions: Solve each multiplication problem by splitting the groups first into smaller facts.

5. 10 x 4 = __________	6. 7 x 5 = __________
7. 11 x 4 = __________	8. 12 x 6 = __________

When split facts to multiply, what must stay the same?

____

Remember: Solve each problem by first splitting up the groups. Then use a model or repeated addition if it helps.

4 x 7 = __________

12 x 9 = __________

Name: ______________________________ G3 Lesson 1-5 Let's Try It

Directions: Solve each multiplication problem by splitting the groups first into smaller facts.

1. 3 x 9 = 27 1 x 9 + 2 x 9 9 + 18 18 + 9 = 27	2. 4 x 5 = 20 2 x 5 + 2 x 5 10 10 20
3. 5 x 8 = 40 2 x 8 + 3 x 8 16 8 + 8 + 8 16 16 + 8 = 24 24 + 16 = 40	4. 6 x 7 = 42 2 x 7 4 x 7 14 7 + 7 + 7 + 7 14 14 14 + 14 = 28 28 + 14 = 42

Directions: Solve each multiplication problem by splitting the groups first into smaller facts.

5. 10 x 4 = 40 5x4 5x4 20 20 20 + 20 = 40	6. 7 x 5 = 35 2x5 5x5 10 25 25 + 10 = 35
7. 11 x 4 = 44 1x4 + 10x4 4 40	8. 12 x 6 = 72 2x6 + 10x6 12 60 60 + 12 = 72

When split facts to multiply, what must stay the same?

The total number of groups and the number in each group.

Name: ________________________________ G3 Lesson 1-5 Independent Work

Remember: Solve each problem by first splitting up the groups. Then use a model or repeated addition if it helps.

4 x 7 = 28

2 x 7 + 2 x 7

14 14

14
+ 14
28

12 x 9 = 108

2 x 9 ~~10 x 9~~

18 9 x 10

10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10

90

18
+ 90
108

G3 U1 Lesson 6

Model partitive division

G3 U1 Lesson 6 - Students will model partitive division

Warm Welcome (Slide 1): Tutor choice

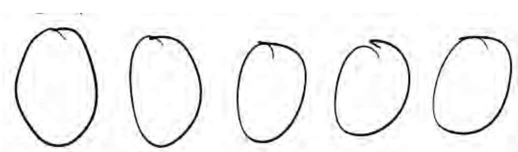
Frame the Learning/Connect to Prior Learning (Slide 2): We're going to continue our multiplication and division unit today. However, today we'll be moving on to division. Multiplication and division go together the same way addition and subtraction do, which is why we learn about them together. Addition and subtraction go together not because they're the same, but because they're opposites. Multiplication and division are also opposites.

Let's Talk (Slide 3): Before I start teaching you about division. I want to see what you know. **What do you think it means to divide?** Possible Student Answers, Key Points:

- If I'm dividing something with a friend, it means I'm breaking it into pieces.
- When I divide something, I make it smaller.
- When I divide something, I take things away to make groups.

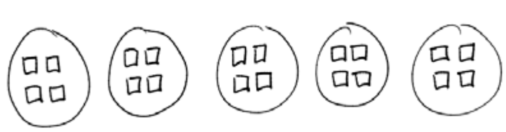
Those are all interesting ideas! The word divide is related to the word division. Just like add is related to addition. Division is a kind of math where we divide or break apart a total into equal groups. That is why multiplication and division are related, because they both work with equal groups. We'll talk more about how they're related later. Right now, let's explore division more.

Let's Think (Slide 4): This example says, break apart 20 into 5 groups. In multiplication we have been talking about equal groups. And we just discussed that multiplication and division are related, so if multiplication uses equal groups, so does division. But, division is the opposite. So we aren't making 20 groups of 5. Instead, in division we start with the total and break it apart into equal groups. For example, maybe I have 20 cookies and I want to split them up onto 5 plates.

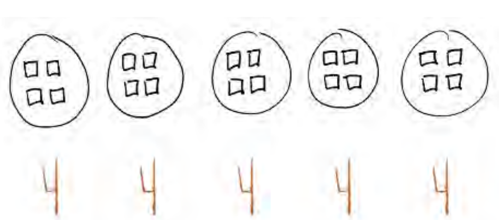


I'm going to start by drawing my groups. Just like when I multiply, I'm going to draw them big enough to fill with objects. I'm going to make them the same size because I know they will be equal. Count with me as I draw: 1 group, 2, groups, 3, groups, 4, groups, 5 groups.

Now I need to break apart 20, my total, into my groups EQUALLY. I'm thinking about the way I would pass out cards if we were playing a card game like uno. In order to make sure everyone gets the same amount of cards, I would pass out one card to every player until I ran out of cards. I can do the same thing here. I can pass out one square to each group until I run out of squares. I would run out at 20 since 20 is my total.



I'm going to draw one square in each group and as I do, I'm going to count out loud and stop when I get to 20. Help me count: 1, 2, 3, 4, 5 (*put 1 square in each group*). Each group has a square and each group has the same number of squares. Can we stop? No, we need to pass out 20 squares total, we only passed out 5. Got it, let's keep going (*continue counting up to 20, putting an object in each group as you go*).



We passed out 20 squares into 5 equal groups. Let's figure out how many squares we ended up with in each group. Count with me…1, 2, 3, 4… 1, 2, 3, 4… (*continue*). How many squares are in each group? 4 squares in each group. Yes! We broke up 20 into 5 equal groups and there were 4 in each group. We just did division!

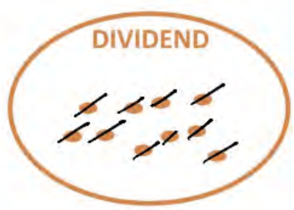
$20 \div 5 = 4$

Let's write our first division equation to show the work we did. In division we start with the total, so I'm going to write 20. The total was broken apart. The symbol to "break apart" is the division symbol, it looks like this *(write the division symbol)*. It doesn't have a fancy name. We broke apart 20 into 5 groups so I'll write 5. My number sentence shows 20 broken up into 5 groups.

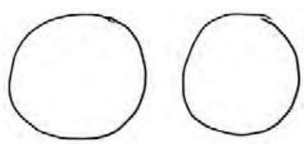
Finally, I can finish this equation by writing the answer. We were able to figure out how many are in each group. We counted the number in each group to find the answer. There were 4 in each group so our answer is 4 *(write =4)*. My equation says 20 broken up into 5 groups is 4 in each group.

In division you start with the total and break it apart into equal groups. Today we're finding how many are in each group.

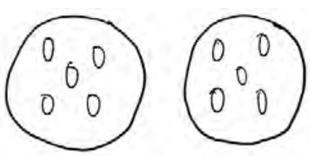
Let's Think (Slide 5): Let's try another. This one looks a little different. Over here, it says dividend. In division the dividend is the total that we're splitting into groups, like the 20 that we started with in our previous example.



Let's count to see what our total is. I'm going to cross out each dot as I count it so I don't get confused and count it twice. Count with me …1, 2, 3, 4, 5, 6, 7, 8, 9, 10. Our total or our dividend is 10.



They want us to split our total, or our dividend, into 2 groups. If I'm thinking of this like cookies, I want to take these 10 cookies and split them onto two plates, one for me and one for my sister. Let's draw those…one group, two groups.



Next I'm going to break apart or divide my dividend into my groups equally by putting one in each group until I run out. I'll count out loud to help me know when I've reached my total. Count with me…1, 2…3, 4…5, 6…7, 8..9, 10. Okay, we've broken apart our total into 2 groups. Now we need to figure out how many are in each group. Count with me…1, 2, 3, 4, 5. 5 in each group. So, there are 5 in each group.

$10 \div 2 = 5$

Now I'm ready to write my equation. What does division always start with? The total. Right, we began with 10, so I'll start my equation with 10. Then what did we do with our total? We broke it apart, we split it into groups. Correct, we broke it apart. What's the symbol to show breaking apart into groups? The division symbol. Yes, we broke our total apart into 2 groups. I'm going to write 2 after the division symbol to show 2 groups. Finally what did we figure out? We figured out how many were in each group. Yes, we figured out how many were in each group. There were 5 in each group, so 5 is our answer. Now my equation shows, we began with 10 total, broke our total up into 2 equal groups, and ended up with 5 in each group.

Let's Talk (Slide 7): Now that you've learned how to multiply and divide. I want you to think about what you know about multiplication and what you learned about division today. **Let's discuss, how are multiplication**

and division related? What's the same about them? What's different? Possible Student Answers, Key Points:

- Both of them use equal groups.
- They're opposites or they undo each other.
- In multiplication you are making the groups and finding the total but in division you have the total and and the groups and you want to know how many are in each group.
- They use the same numbers but different symbols.

Multiplication and division are related because they both use a total and equal groups. In multiplication, we're told how many groups there are and how many are in each group. We use this information to find the total. However, in division we're given the total and today we were told how many groups there were. We used that information to find out how many are in each group. We'll continue exploring the relationship between multiplication and division in the remainder of our lessons.

Let's Try It (Slide 9): For the rest of today, let's try modeling division together on our worksheet. Remember to start with the total and split it into equal groups and then count how many are in each group. It's incredibly important we don't go past our total since our total represents all that we have.

WARM WELCOME

Today we will model partitive division.

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Let's Talk:

What do you think it means to divide?

Let's Think:

Break apart 20 into 5 groups

Division Number Sentence: ______________________________

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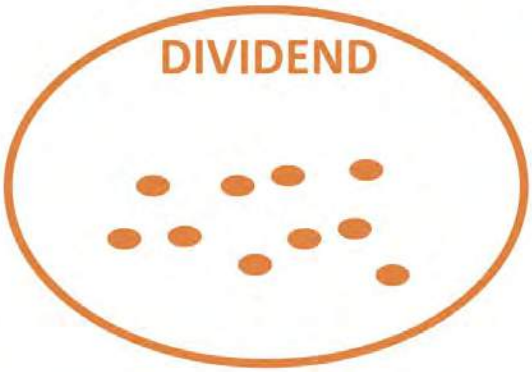
Let's Think:



Make 2 groups.

Division Number Sentence: ___________________________

Let's Review:

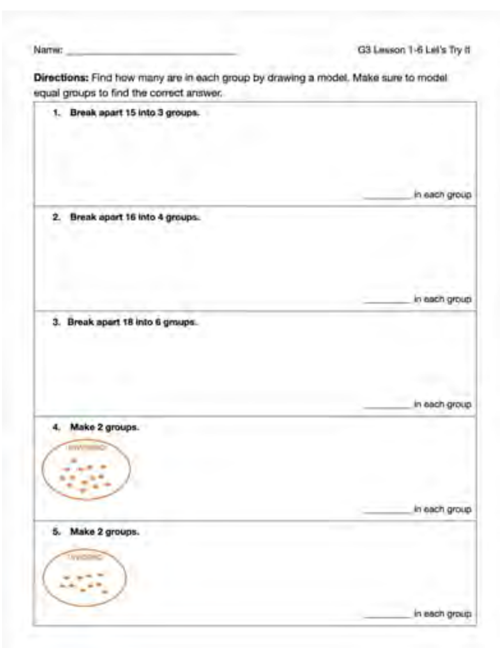
When we multiply, we __________ or _________ all the pieces in the _______ groups, to find the __________.

Let's Talk:

Division is the inverse of multiplication.

3 x 5 = 15	15 ÷ 3 = 5

Let's Try It:



Name: ______________________ G3 Lesson 1-6 Let's Try It

Directions: Find how many are in each group by drawing a model. Make sure to model equal groups to find the correct answer.

1. **Break apart 15 into 3 groups.**

   ______ in each group

2. **Break apart 16 into 4 groups.**

   ______ in each group

3. **Break apart 18 into 6 groups.**

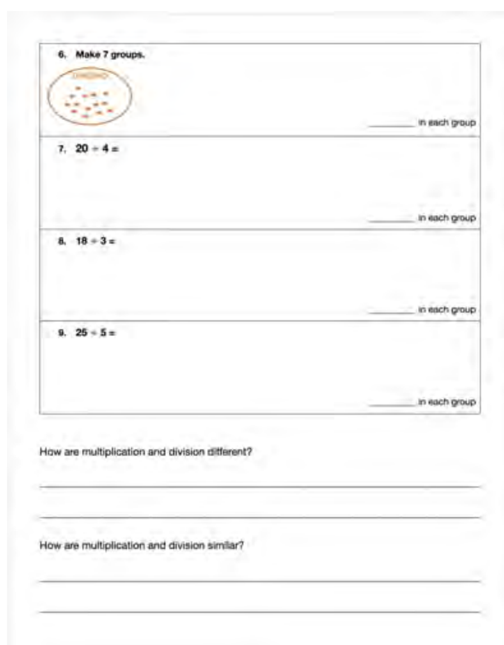
   ______ in each group

4. **Make 2 groups.**

   ______ in each group

5. **Make 2 groups.**

   ______ in each group



6. **Make 7 groups.**

   ______ in each group

7. **20 ÷ 4 =**

   ______ in each group

8. **18 ÷ 3 =**

   ______ in each group

9. **25 ÷ 5 =**

   ______ in each group

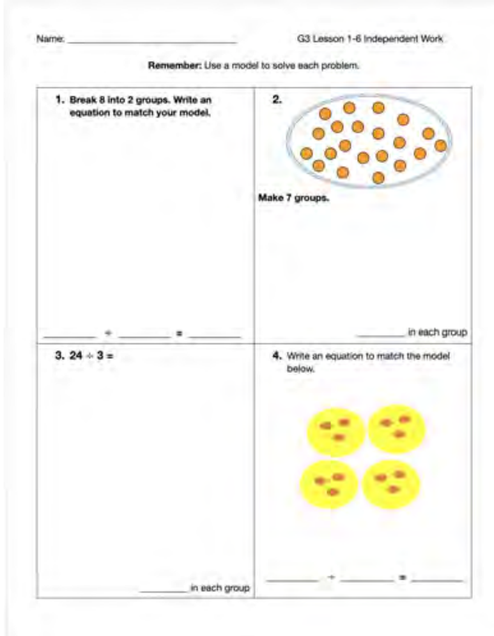
How are multiplication and division different?

____

How are multiplication and division similar?

____

On your Own:



Name: ______________________ G3 Lesson 1-6 Independent Work

Remember: Use a model to solve each problem.

1. Break 8 into 2 groups. Write an equation to match your model.

_______ ÷ _______ = _______

2.

Make 7 groups.

_______ in each group

3. 24 ÷ 3 =

_______ in each group

4. Write an equation to match the model below.

_______ ÷ _______ = _______

Name: ______________________________

Directions: Find how many are in each group by drawing a model. Make sure to model equal groups to find the correct answer.

1. Break apart 15 into 3 groups.

__________ in each group

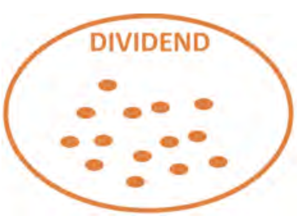
2. Break apart 16 into 4 groups.

__________ in each group

3. Break apart 18 into 6 groups.

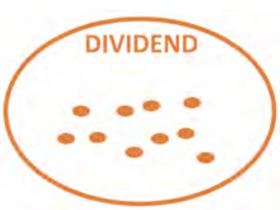
__________ in each group

4. Make 2 groups.



__________ in each group

5. Make 2 groups.



__________ in each group

6. **Make 7 groups.**  __________ in each group	
7. **20 ÷ 4 =** __________ in each group	
8. **18 ÷ 3 =** __________ in each group	
9. **25 ÷ 5 =** __________ in each group	

How are multiplication and division different?

____

____

How are multiplication and division similar?

____

____

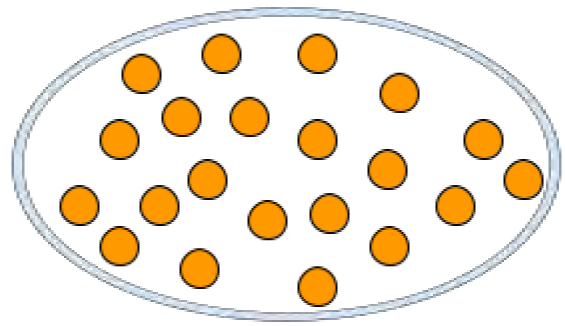
Name: ______________________________ G3 U1 Lesson 6 - Independent Work

Remember: Use a model to solve each problem.

1. Break 8 into 2 groups. Write an equation to match your model.

_________ ÷ _________ = _________

2.



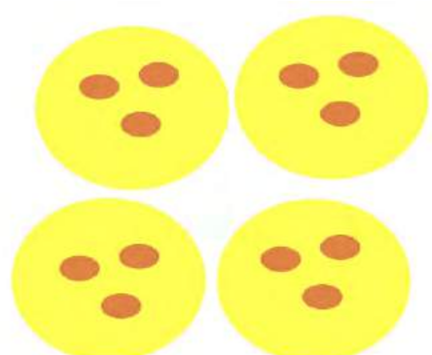
Make 7 groups.

________ in each group

3. 24 ÷ 3 =

________ in each group

4. Write an equation to match the model below.



_________ ÷ _________ = _________

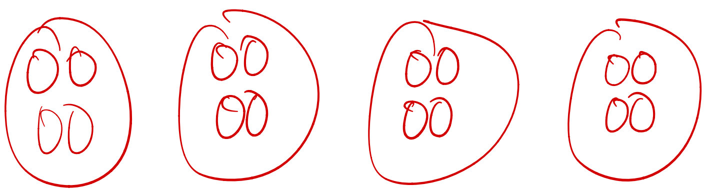
Name: ______________________________ G3 Lesson 1-6 Let's Try It

Directions: Find how many are in each group by drawing a model. Make sure to model equal groups to find the correct answer.

1. **Break apart 15 into 3 groups.**

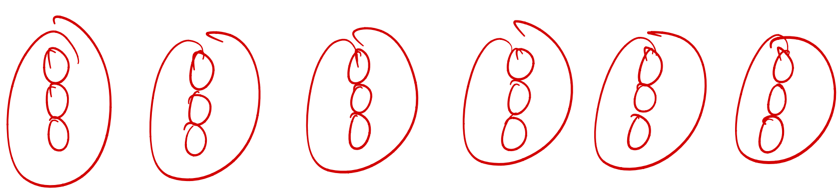
5 in each group

2. **Break apart 16 into 4 groups.**



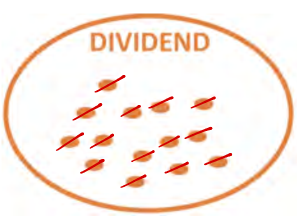
4 in each group

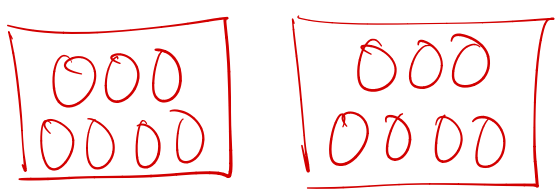
3. **Break apart 18 into 6 groups.**



3 in each group

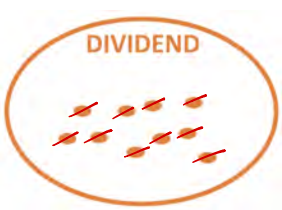
4. **Make 2 groups.**

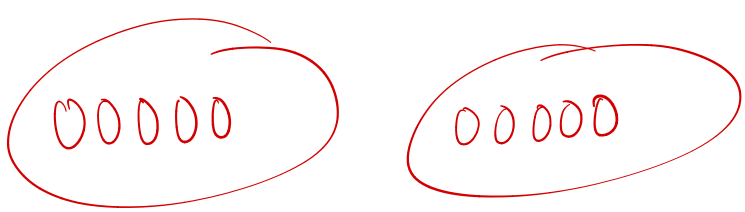




7 in each group

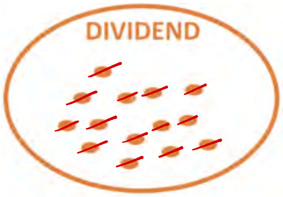
5. **Make 2 groups.**

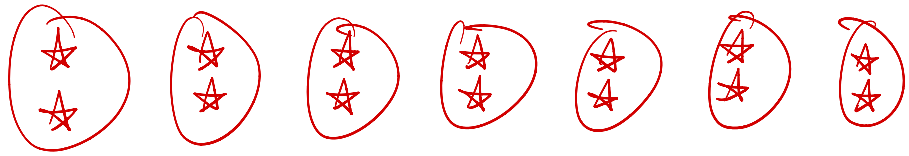




5 in each group

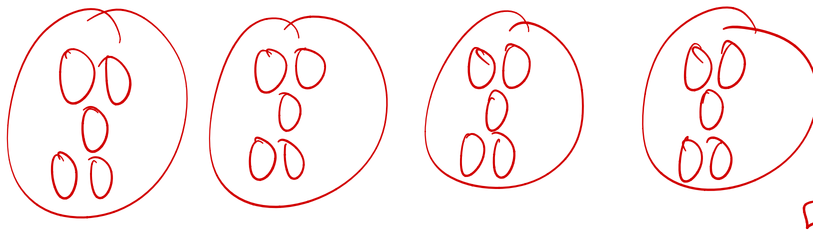
6. **Make 7 groups.**





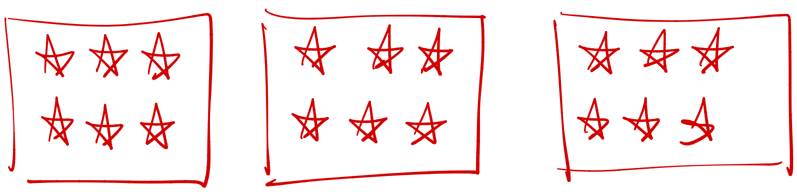
2 in each group

7. **20 ÷ 4 =**



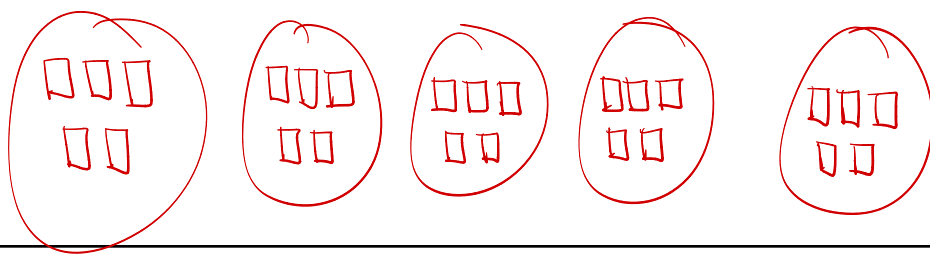
5 in each group

8. **18 ÷ 3 =**



6 in each group

9. **25 ÷ 5 =**



5 in each group

How are multiplication and division different?

Multiplication finds the total. Division breaks up the total.

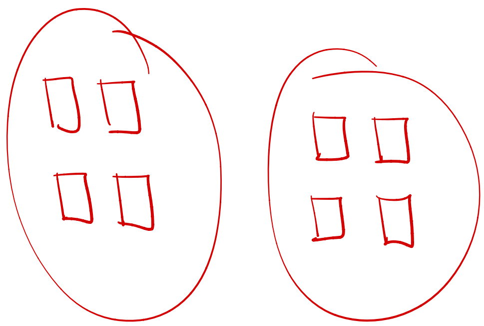
How are multiplication and division similar?

They both use equal groups.

Name: ______________________________ G3 Lesson 1-6 Independent Work

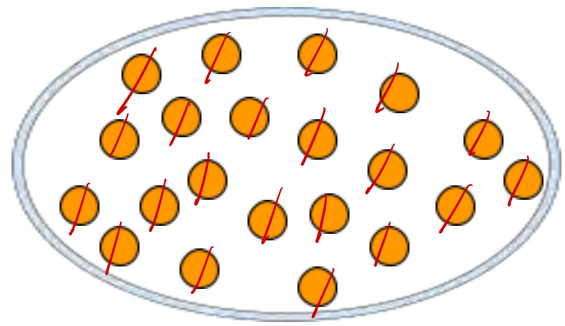
Remember: Use a model to solve each problem.

1. Break 8 into 2 groups. Write an equation to match your model.

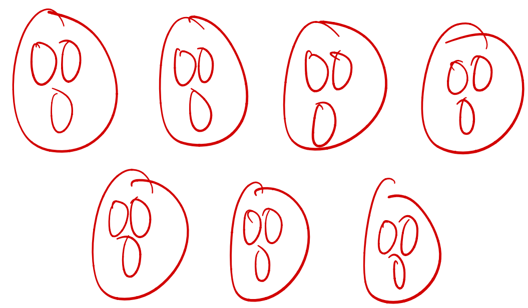


8 ÷ 2 = 4

2.

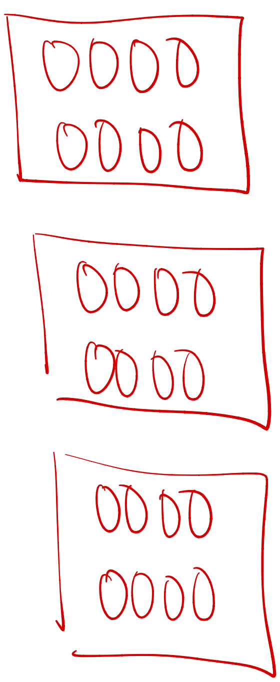


Make 7 groups.



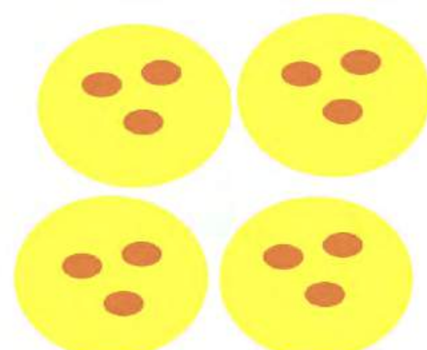
3 in each group

3. 24 ÷ 3 =



8 in each group

4. Write an equation to match the model below.



12 ÷ 4 = 3

G3 U1 Lesson 7

Model partitive division story problems

G3 U1 Lesson 7 - Students will model partitive division story problems

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): Today, we're going to use everything we learned yesterday about division and apply it to story problems. Story problems can be tough because we have to make sense of the information in the story and pull out the numbers we need to solve. Before we get into the story problems, let's review some of what we talked about yesterday.

Let's Review (Slide 3): I want you to try to fill in each of the sentences below. It's okay to skip around.

- Division is the **opposite/inverse** of multiplication
- Division starts with the **total/dividend**.
- Yesterday we solved division problems and found the **number in each group**.

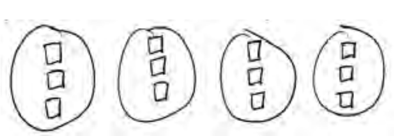
Great job working with me to fill those in. Yes, division is the opposite of multiplication. They both use equal groups, but division starts with the total, whereas in multiplication we solve for the total at the end. In division we solve for the number in each group or number of groups. Yesterday we only found the number in each group and we'll do that again today.

Let's Talk (Slide 4): Yesterday, we solved a ton of division problems. Each time we solved, we were given part of an equation and we had to solve it to find the answer. What information were we given? The total and the number of groups! Right, we used the total and the number of groups in order to begin solving. Today, just like yesterday, as we're solving word problems, I'm going to be looking for the total and I'm going to be looking for the number of groups in order to draw my model and solve.

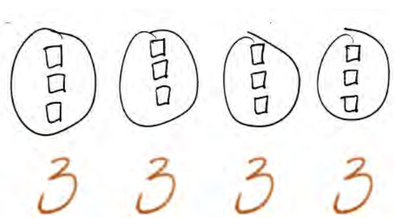
Let's Think (Slide 5): Whenever I get a word problem, first I read it. Listen as we read this together, "There are 12 stickers and 4 pages. If I put the same number of stickers on each page, how many stickers are on each page?" Then, before I solve it, I retell it in my own words to make sure I understand it. So, there's a photo book or photo album with 4 pages. I need to put the 12 pictures on the pages. All the pages have to have the same amount of photos. I need to figure out how many photos are on each page.

Now that I'm sure I understand the story, I need to pull out the important information. I know I need to find the total. The total must be 12, it's the largest number, it's all the pictures we have. I know I need to find the groups. The pages must be my groups, because I'll put the pictures on the pages just like I'd put my squares in my groups.

Now I'm ready to draw my model. I'm going to draw 4 groups because there are FOUR PAGES. Count the groups with me as I draw: 1 group, 2 groups, 3 groups, 4 groups. There, I have 4 groups for my 4 pages.



Now I need to break up my total equally onto my pages/groups. My total is 12. I'm going to put one square in each group like I'm putting one sticker on each page. I'm going to keep putting squares in groups and continue counting until I get to 12. We know we have to stop at 12, because that's my total and that's all the stickers I have.



Now I need to count how many stickers I put on each page, let's count together…1, 2, 3…1, 2, 3… 1, 2, 3… 1, 2, 3. Each page has 3 stickers on it. The answer is 3 stickers on each page. We figured out how many stickers were on each page by figuring out how many were in each group.

$12 \div 4 = 3$

Finally, I'm going to write an equation to represent my work. I started with 12 and broke it apart into 4 groups. I ended with 3 stickers on each page *(write equation as you narrate meaning)*.

Let's Try It (Slide 7): Let's try some division story problems together now. Remember, we need to read the problem out loud, retell it, pull out the important information, draw a model, write an equation and solve it. Those may seem like a lot of steps, but they'll help us get the right answer.

WARM WELCOME

Today we will model partitive division story problems.

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Let's Review:

- **Division is the __________ of multiplication.**
- **Division starts with the __________.**
- **Division solves for the <u>number of groups</u> or <u>number in each group</u>.**
- **Yesterday we solved division problems and found __________.**

Let's Talk:

Story problems have all the information we need. We just have to find it.

What information were we given to solve division problems yesterday?

Let's Think:

There are 12 stickers and 4 pages. If I put the same number of stickers on each page, how many stickers are on each page?

Let's Try It:

Name: ____________________ G3 Lesson 1-7 Let's Try It

Directions: Find how many are in each group by drawing a model. Make sure to identify and label your final answer at the bottom.

1. Max has 14 stickers. He wants to put an equal number of stickers on 2 posters. How many stickers will go on each poster?

_____ ÷ _____ = _____ __________ in each __________

2. There are 16 dogs. The dogs are divided equally between 2 homes. How many dogs are in each home?

_____ ÷ _____ = _____ __________ in each __________

3. There are 3 marker boxes. 21 crayons are divided between the boxes. How many markers are in each box.

_____ ÷ _____ = _____ __________ in each __________

4. Thirty students are in each classroom. There are five equal table groups in each classroom. How many students sit at each table group?

_____ ÷ _____ = _____ __________ in each __________

Directions: Find how many are in each group by drawing a model. Write an equation and label each answer below.

5. Suzy is decorating cupcakes. She only has 32 sprinkles left, but still needs to decorate 4 more cupcakes. How many sprinkles will each cupcake get?

_____ ÷ _____ = _____ __________ in each __________

6. Ms. Robinson gave out stickers in her classroom everyday last week. She started the week with 30 stickers and used them all. How many stickers did she give out each day last week?

_____ ÷ _____ = _____ __________ in each __________

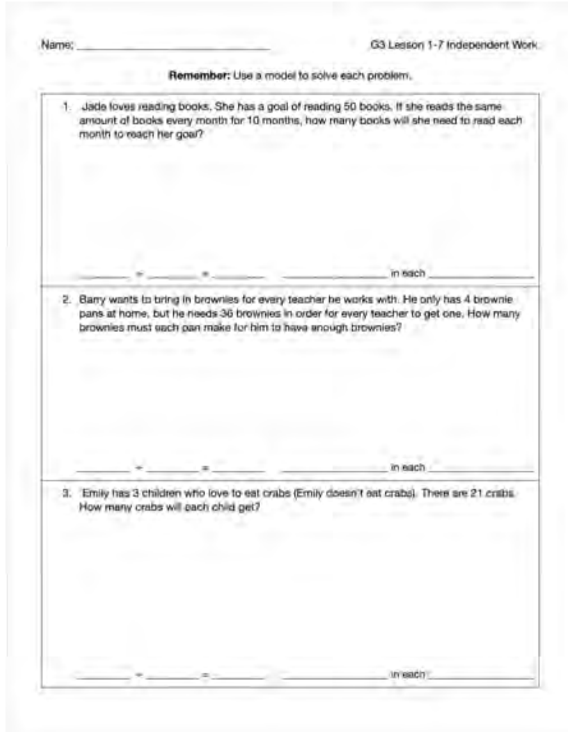
7. Richard is bringing prize bags for his best friends for his birthday. He has 6 best friends and 36 prizes altogether. How many prizes will each friend get in their prize bag?

_____ ÷ _____ = _____ __________ in each __________

8. Kim needs to sleep 56 hours every week to feel rested. How many hours will she need to sleep every night?

_____ ÷ _____ = _____ __________ in each __________

On your Own:



Name: ____________________ G3 Lesson 1-7 Independent Work

Remember: Use a model to solve each problem.

1. Jade loves reading books. She has a goal of reading 50 books. If she reads the same amount of books every month for 10 months, how many books will she need to read each month to reach her goal?

_______ ÷ _______ = _______ _____________ in each _____________

2. Barry wants to bring in brownies for every teacher he works with. He only has 4 brownie pans at home, but he needs 36 brownies in order for every teacher to get one. How many brownies must each pan make for him to have enough brownies?

_______ ÷ _______ = _______ _____________ in each _____________

3. Emily has 3 children who love to eat crabs (Emily doesn't eat crabs). There are 21 crabs. How many crabs will each child get?

_______ ÷ _______ = _______ _____________ in each _____________

Name: ___________________________________ G3 U1 Lesson 7 - Let's Try It

Directions: Find how many are in each group by drawing a model. Make sure to identify and label your final answer at the bottom.

1. Max has 14 stickers. He wants to put an equal number of stickers on 2 posters. How many stickers will go on each poster?

__________ ÷ __________ = __________ ____________________ in each ____________________

2. There are 16 dogs. The dogs are divided equally between 2 homes. How many dogs are in each home?

__________ ÷ __________ = __________ ____________________ in each ____________________

3. There are 3 marker boxes. 21 crayons are divided between the boxes. How many markers are in each box.

__________ ÷ __________ = __________ ____________________ in each ____________________

4. Thirty students are in each classroom. There are five equal table groups in each classroom. How many students sit at each table group?

__________ ÷ __________ = __________ ____________________ in each ____________________

Directions: Find how many are in each group by drawing a model. Write an equation and label each answer below.

5. Suzy is decorating cupcakes. She only has 32 sprinkles left, but still needs to decorate 4 more cupcakes. How many sprinkles will each cupcake get?

__________ ÷ __________ = __________ ____________________ in each ____________________

6. Ms. Robinson gave out stickers in her classroom everyday last week. She started the week with 30 stickers and used them all. How many stickers did she give out each day last week?

__________ ÷ __________ = __________ ____________________ in each ____________________

7. Richard is bringing prize bags for his best friends for his birthday. He has 6 best friends and 36 prizes altogether. How many prizes will each friend get in their prize bag?

__________ ÷ __________ = __________ ____________________ in each ____________________

8. Kim needs to sleep 56 hours every week to feel rested. How many hours will she need to sleep every night?

__________ ÷ __________ = __________ ____________________ in each ____________________

Remember: Use a model to solve each problem.

1. Jade loves reading books. She has a goal of reading 50 books. If she reads the same amount of books every month for 10 months, how many books will she need to read each month to reach her goal?

_________ ÷ _________ = _________ __________________ in each __________________

2. Barry wants to bring in brownies for every teacher he works with. He only has 4 brownie pans at home, but he needs 36 brownies in order for every teacher to get one. How many brownies must each pan make for him to have enough brownies?

_________ ÷ _________ = _________ __________________ in each __________________

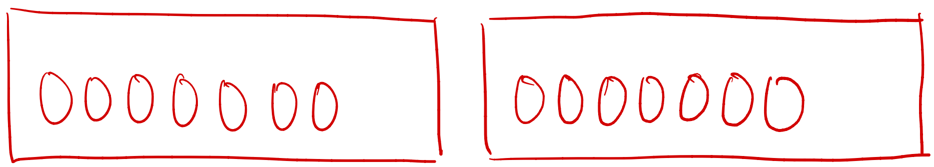
3. Emily has 3 children who love to eat crabs (Emily doesn't eat crabs). There are 21 crabs. How many crabs will each child get?

_________ ÷ _________ = _________ __________________ in each __________________

Name: ______________________________ G3 Lesson 1-7 Let's Try It

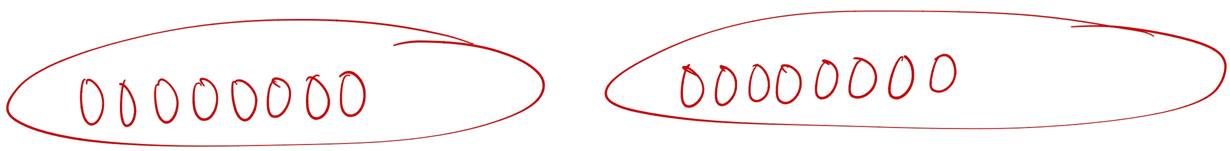
Directions: Find how many are in each group by drawing a model. Make sure to identify and label your final answer at the bottom.

1. Max has 14 stickers. He wants to put an equal number of stickers on 2 posters. How many stickers will go on each poster?



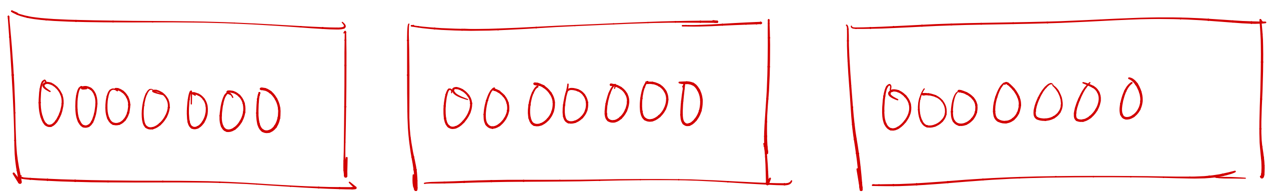
14 ÷ 2 = 7 stickers in each poster

2. There are 16 dogs. The dogs are divided equally between 2 homes. How many dogs are in each home?



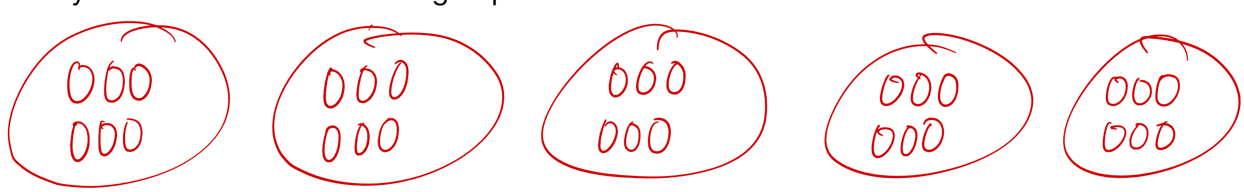
16 ÷ 2 = 8 dogs in each home

3. There are 3 marker boxes. 21 crayons are divided between the boxes. How many markers are in each box.



21 ÷ 3 = 7 markers in each box

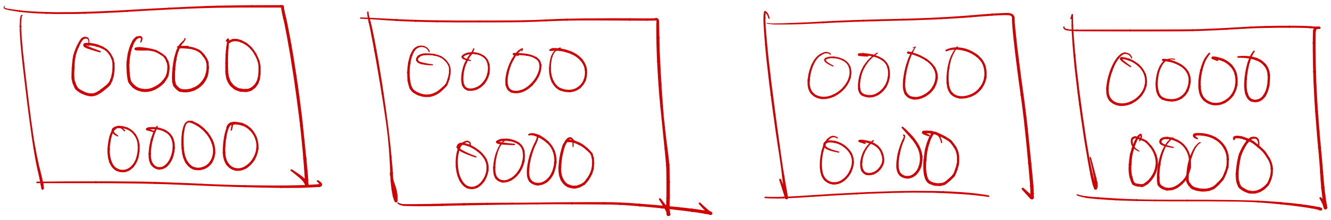
4. Thirty students are in each classroom. There are five equal table groups in each classroom. How many students sit at each table group?



30 ÷ 5 = 6 students in each table group

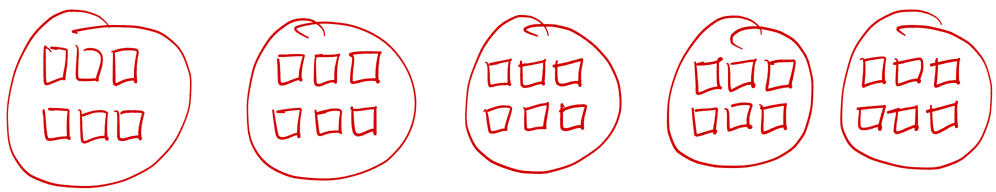
Directions: Find how many are in each group by drawing a model. Write an equation and label each answer below.

5. Suzy is decorating cupcakes. She only has 32 sprinkles left, but still needs to decorate 4 more cupcakes. How many sprinkles will each cupcake get?



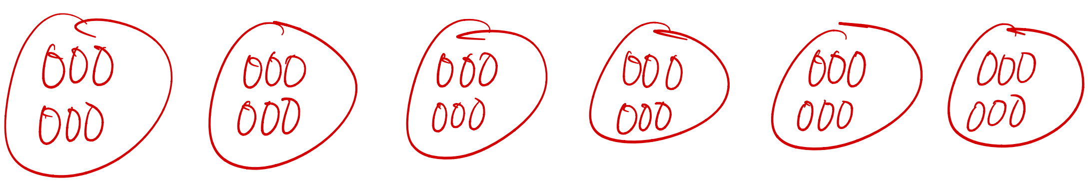
32 ÷ 4 = 8 sprinkles in each cupcake

6. Ms. Robinson gave out stickers in her classroom everyday last week. She started the week with 30 stickers and used them all. How many stickers did she give out each day last week?



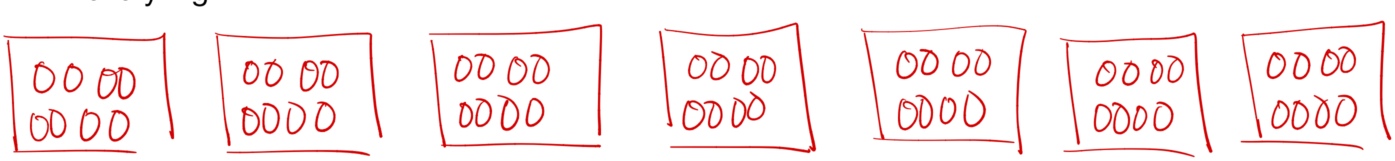
30 ÷ 5 = 6 stickers in each day

7. Richard is bringing prize bags for his best friends for his birthday. He has 6 best friends and 36 prizes altogether. How many prizes will each friend get in their prize bag?



36 ÷ 6 = 6 prizes in each bag

8. Kim needs to sleep 56 hours every week to feel rested. How many hours will she need to sleep every night?



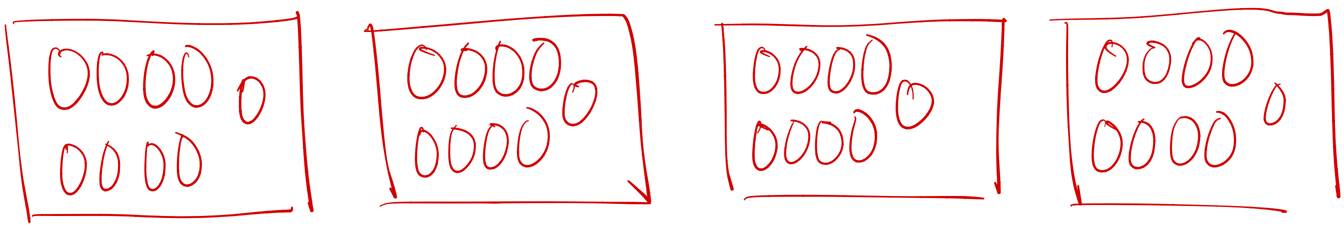
56 ÷ 7 = 8 hours in each night

Remember: Use a model to solve each problem.

1. Jade loves reading books. She has a goal of reading 50 books. If she reads the same amount of books every month for 10 months, how many books will she need to read each month to reach her goal?

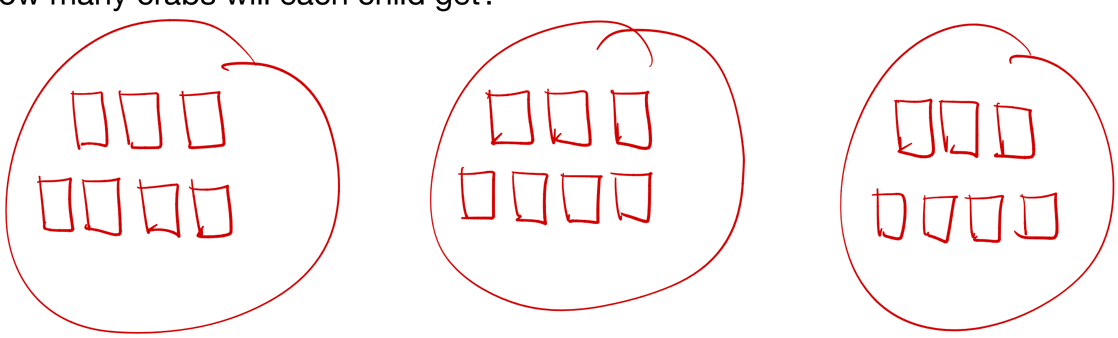
50 ÷ 10 = 5 books in each month

2. Barry wants to bring in brownies for every teacher he works with. He only has 4 brownie pans at home, but he needs 36 brownies in order for every teacher to get one. How many brownies must each pan make for him to have enough brownies?



36 ÷ 4 = 9 brownies in each pan

3. Emily has 3 children who love to eat crabs (Emily doesn't eat crabs). There are 21 crabs. How many crabs will each child get?



21 ÷ 3 = 7 crabs in each child

G3 U1 Lesson 8

Model quotative division

G3 U1 Lesson 8 - Students will model quotative division

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): We're going to continue learning about division today by learning about a different, but similar, kind of division. First, let's quickly review what we've learned so far.

Let's Review (Slide 3): Fill in the blanks to show what you know so far about division.

- Division starts with the **total**.
- Yesterday (and the day before) we solved division problems and found the **amount in each group**.

Today we're going to continue dividing, but instead of finding the number in each group, we're going to find the number of groups.

Let's Talk (Slide 4): Let's start with a quick discussion, **what are some ways we can pass out Uno cards?** Possible Student Answers/Key Points:

- Pass out one card at a time to each person
- Pass out more than one card at a time, but the same amount to each person (2, 3, 4 cards at a time)

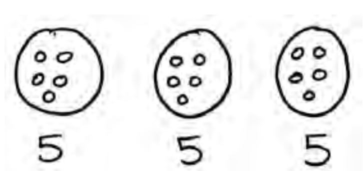
When we began dividing, we started by passing out cards or objects one at a time, because we didn't know how many cards each person would get. But, we can also give out more than 1 card at a time, as long as everyone still gets the same number of cards. Let's try handing out more than one card today.

Let's Think (Slide 5): There are two problems below. One is the kind of problem we've had over the past couple days. One is new. Take a look. **What's the same about the problems, what's different?** Possible Student Answers/Key Points:

- Both problems start with 15 as the total/dividend.
- Both problems break into 3
- One wants you to make 3 groups and we don't know how many are in each group.
- One wants you to make groups of 3 and we don't know how many groups there are.
- I think the answer to both is the same, we just get it in a different way.

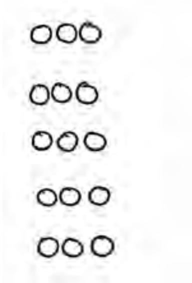
That's great thinking! In the problem on the right, it tells us to break 15 into 3 groups and just like the problems we solved yesterday, we don't know how many there are in each group. But, in the problem on the left it says break 15 into groups of 3, so we'd be making groups of three, or passing three cards out at a time, and we don't know how many times we could pass out 3, in other words we don't know how many groups there are.

These are the two kinds of division problems you'll encounter. We spent the past two days solving the problem on the left, counting how many are in each group. Today I'm going to show you how to solve the problem on the right.

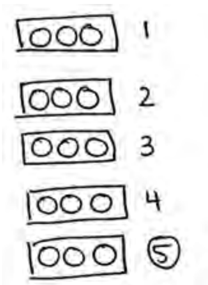


Let's start by quickly solving the problem on the right. Everybody get your whiteboard or a piece of paper and draw a picture to break 15 into 3 groups. Very good! I see that people started by drawing 3 groups and then passing out 15, one by one. And then going back to count HOW MANY were in EACH group. Your answer was 5. Your picture looks something like this!

Now let's work together to think about how the problem on the right is different from this. It says break 15 apart into groups of 3. We have the same two numbers but it's asking us to do something different. It says break 15 into groups of 3. So we know how many are going to be in each group…three!



So, I’m going to make groups of 3 until I get to 15. As I draw my groups OF THREE, I'm going to be careful to separate them so I can go back and count how many groups. This is kind of like passing out Uno cards, I’m making a pile of 3 and then another pile of 3, until I run out. Count with me…1, 2, 3…4, 5, 6…7, 8, 9…10, 11, 12…13, 14, 15. Look, I made groups of 3 until I got to 15.



Now, my answer isn’t 3. In this type of division problem I’m not trying to figure out how many are in each group, I’m trying to figure out how many groups there are. So let’s go back and count the groups. I’m going to circle them, or put a box around them, to show that they’re a group. Count the groups with me…1 group, 2 groups, 3 groups, 4 groups, 5 groups. So in this problem, the answer isn’t the number in each group, it’s how many groups I made.

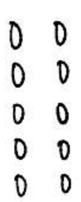
Now that we explored two different ways to model division, let’s come back to our question. **How are these two problems the same and how are they different?**

That’s right, they both have 15 divided by 3 and they both equal 5 but what we’re trying to figure out is different. This is called quotative division, where we know the total and the amount in each group but we don’t know the number of groups.

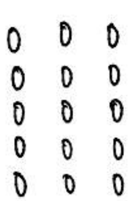
Let’s Think (Slide 6): Let’s look at one more problem together. It says break about 20 into groups of 5. Normally we start by drawing the groups. But we don’t actually know how many groups there are. However, we do know how many go in each group. So we’re going to make the groups one at a time, just like we might make piles of Uno cards. We know each group has 5, so once we have 5, we have a full group.

Just like yesterday, we know our total tells us when to stop. We count out loud and when we get to 20 we stop. I want you to pay special attention to how I arrange each group. That means pay special attention to where I put everything.

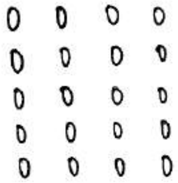
I’m going to make my first group of 5 because it says to break 20 into GROUPS OF 5. I want it to be super neat so I’m going to make my group in one long line. I’m going to put each circle underneath the other. Watch me: 1, 2, 3, 4, 5. 5. That’s one whole group.



Now that I have my first group, I’m going to make my next group. I’m going to arrange my second group next to the first group with a little space in between. How many will be in my next group? 5. Yes 5, because it says groups of 5 and because we know our groups have to be equal. I’m going to keep counting out loud, remember, I keep going until I get to 20. *(Recount the first group, pointing at each circle: 1, 2, 3, 4, 5; then keep going and count/draw the next group of 5 like shown below, “6, 7, 8, 9, 10”)* Even though I counted up to 10, I know this group has 5 in it because it lines up perfectly with my first groups, which I KNOW had 5.



I only got to 10 total, so I’m going to keep going and make another group. I’m being careful to line up each group next to the previous group. I line them up to make sure they each have 5 since I have to keep counting the total past 5.



I got to 15 total, but I know I need to keep going to get to 20 total, I'm going to start my next group, being careful to line my next group up next to the previous group. Whew, I finally got to 20. Why did I stop at 20? Because 20 is the total, it's all you have. Yes, even though our modeling looks different today, our total never changes. It's all we have and we have to stop when we reach it.

Today, they told me how many were in each group, unlike yesterday. I need to figure out HOW MANY GROUPS I have. I'm going to count each group of 5 out loud and as I do, I'm going to circle it, so my groups are really easy to see. Count with me…1 group, 2 groups, 3, groups, 4, groups. How many groups did we make? 4! We have 4 total groups. Did you see how easy it was to count our groups now that we lined them up so carefully.

$20 \div 5 = 4$

I can clearly see that I have 4 groups circled and they're equal with 5 in each one. Finally I need to write the division sentence to match my work: 20 total broken apart into groups of 5 make 4 groups, so 20 divided by 5 equals 4.

Let's Try It (Slide 8): This was an interesting lesson as another way to solve division, let's work on some together. Remember we always start with our total and we always make equal groups. However this time we'll be finding out how many groups rather than how many are in each group.

WARM WELCOME

Today we will model quotative division.

Let's Review:

- **Division starts with the __________.**

- **Division solves for the number of groups or number in each group.**

- **Yesterday we solved division problems and found __________.**

Let's Talk:

What are some ways we can pass out Uno cards?

Let's Think:

What do you notice about the two problems below?

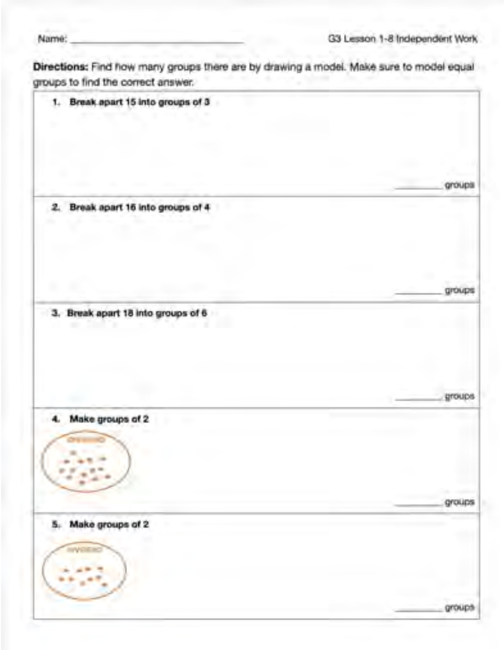
Break 15 apart into 3 groups.	Break 15 apart into groups of 3.

Let's Think:

Break apart 20 into groups of 5.

Division Number Sentence: ______________________________

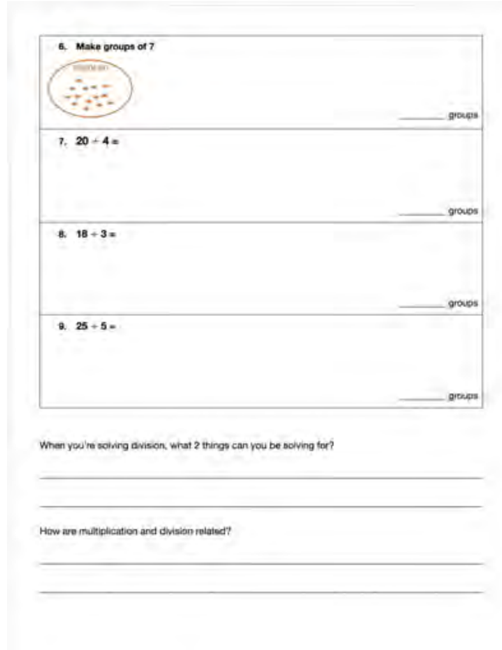
Let's Try It:



Name: ______________________ G3 Lesson 1-8 Independent Work

Directions: Find how many groups there are by drawing a model. Make sure to model equal groups to find the correct answer.

1. **Break apart 15 into groups of 3** ______ groups
2. **Break apart 16 into groups of 4** ______ groups
3. **Break apart 18 into groups of 6** ______ groups
4. **Make groups of 2** ______ groups
5. **Make groups of 2** ______ groups

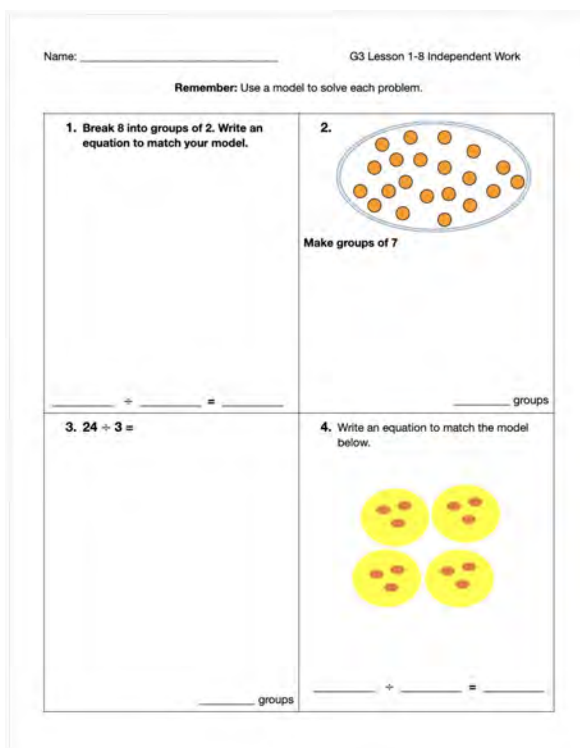


6. **Make groups of 7** ______ groups
7. **20 ÷ 4 =** ______ groups
8. **18 ÷ 3 =** ______ groups
9. **25 ÷ 5 =** ______ groups

When you're solving division, what 2 things can you be solving for?

How are multiplication and division related?

On your Own:



Name: ______________________ G3 Lesson 1-8 Independent Work

Remember: Use a model to solve each problem.

1. **Break 8 into groups of 2. Write an equation to match your model.** ______ ÷ ______ = ______
2. **Make groups of 7** ______ groups
3. **24 ÷ 3 =** ______ groups
4. Write an equation to match the model below. ______ ÷ ______ = ______

Name: ___________________________________ G3 U1 Lesson 8 - Independent Work

Directions: Find how many groups there are by drawing a model. Make sure to model equal groups to find the correct answer.

1. Break apart 15 into groups of 3

__________ groups

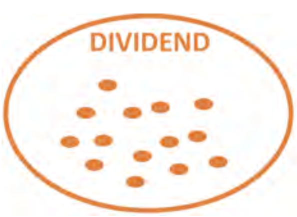
2. Break apart 16 into groups of 4

__________ groups

3. Break apart 18 into groups of 6

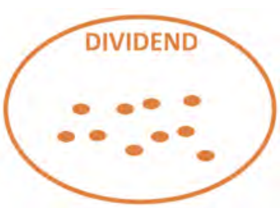
__________ groups

4. Make groups of 2



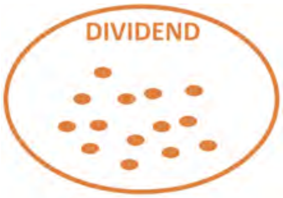
__________ groups

5. Make groups of 2



__________ groups

6. Make groups of 7



__________ groups

7. 20 ÷ 4 =

__________ groups

8. 18 ÷ 3 =

__________ groups

9. 25 ÷ 5 =

__________ groups

When you're solving division, what 2 things can you be solving for?

____

____

How are multiplication and division related?

____

____

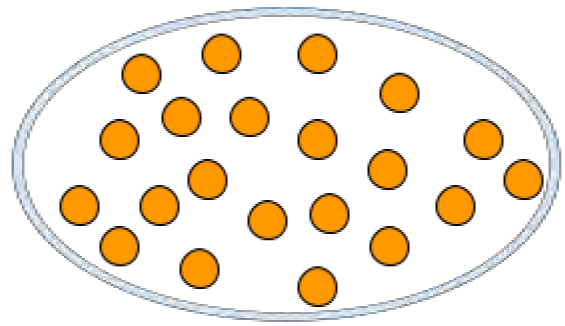
Name: ______________________________ G3 U1 Lesson 8 - Independent Work

Remember: Use a model to solve each problem.

1. Break 8 into groups of 2. Write an equation to match your model.

_______ ÷ _______ = _______

2.



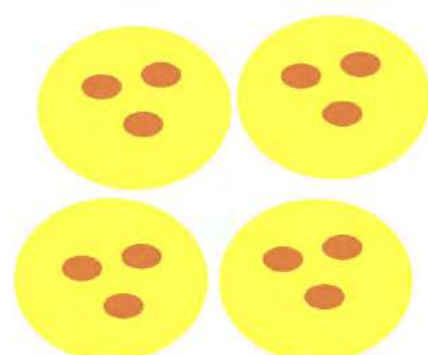
Make groups of 7

_______ groups

3. 24 ÷ 3 =

_______ groups

4. Write an equation to match the model below.



_______ ÷ _______ = _______

Name: ______________________________

Directions: Find how many groups there are by drawing a model. Make sure to model equal groups to find the correct answer.

1. Break apart 15 into groups of 3

5 groups

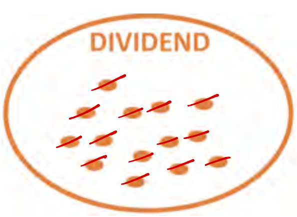
2. Break apart 16 into groups of 4

4 groups

3. Break apart 18 into groups of 6

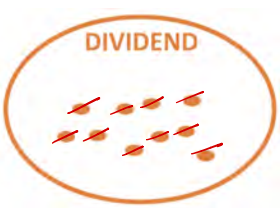
3 groups

4. Make groups of 2

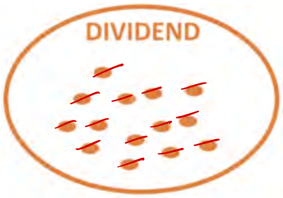


7 groups

5. Make groups of 2



5 groups

6. **Make groups of 7** 	2 groups
7. **20 ÷ 4 =**	5 groups
8. **18 ÷ 3 =**	6 groups
9. **25 ÷ 5 =**	5 groups

When you're solving division, what 2 things can you be solving for?

The number of groups and number in each group.

How are multiplication and division related?

Multiplication and division are inverses.

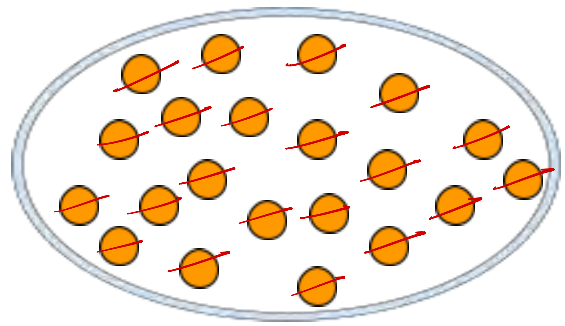
Name: ____________________ G3 Lesson 1-8 Independent Work

Remember: Use a model to solve each problem.

1. **Break 8 into groups of 2. Write an equation to match your model.**

8 ÷ 2 = 4

2.



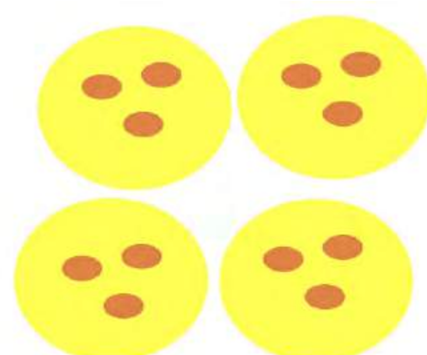
Make groups of 7

3 groups

3. **24 ÷ 3 =**

8 groups

4. Write an equation to match the model below.



12 ÷ 4 = 3

G3 U1 Lesson 9

Model quotative division story problems

G3 U1 Lesson 9 - Students will model quotative division story problems

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): Today, we're going to use everything we learned yesterday about quotative division and apply it to story problems. Story problems can be tough because we have to make sense of the information in the story and pull out the numbers we need to solve. Before we get into the story problems, let's review some of what we talked about yesterday.

Let's Review (Slide 3): I want you to try to fill in each of the sentences below. It's okay to skip around.

- Division starts with the **total/dividend**.
- Yesterday we solved division problems and found the **number of groups**.

Great job working with me to fill those in. In division we solve for the number in each group or number of groups. Yesterday we worked to find the number of groups. We'll continue that today.

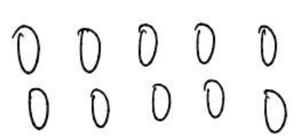
Let's Talk (Slide 4): Yesterday we solved a lot of division problems. Each time we solved, we were given part of an equation and we had to solve it to find the answer. What information were we given? The total and the number in each group

Correct, we need the total and the number in each group to begin solving. Today as we're solving word problems, I'm going to be looking for the total and I'm going to be looking for the number in each group in order to set up my model and solve.

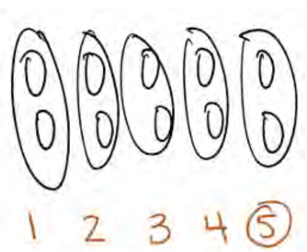
Let's Think (Slide 5): Whenever I get a word problem, first I read it, listen as I read this. "There is $10. Each kid gets $2. How many kids are there? Then I retell it in my own words to make sure I understand it. **Turn and retell the story to a partner in your own words.**

Now that I'm sure I understand the story, I need to pull out the important information. I know I need to find the total. The total must be 10, since that's the whole amount of money that we have to pass out to the kids. I know that each kid is going to get $2 so that means that 2 goes in each group, kind of like those piles of Uno cards…we're making groups, or piles, of 2! That means the kids must be the groups since they're getting the money.

Now I'm ready to draw my model. I'm going to draw 2 circles, 1, 2. Those are 2 dollars for one kid. I need to keep giving out 2 dollars until I get to 10. I need to keep drawing groups of 2 until I get to 10 total.



Let's keep counting until we get to 10. I'll draw our groups of 2 and stop when we get to 10. Let's start from the beginning: 1, 2, *(start drawing)* 3, 4… 5, 6… 7, 8… 9, 10. We have 10 total so we can stop.



Now, we need to figure out how many groups we made, or how many kids there are. You count the groups as I circle them: 1 group, 2, groups, 3 groups, 4 groups, 5 groups. There are 5 groups or 5 kids that each got 2 dollars.

$10 \div 2 = 5$

Now I'm ready to write my equation. There were 10 dollars total, we broke apart the total to give each kid 2 dollars. We ended up giving money to 5 kids. So, 10 divided by 2 equals 5.

Let's Try It (Slide 6-7): Let's try some division story problems together now. Remember, we need to read the problem, retell to make sure we understand, draw a model of the important information and finish with an equation to show how we got our answer.

WARM WELCOME

Today we will model quotative division story problems.

Let's Review:

- **Division starts with the __________.**
- **Division solves for the <u>number of groups</u> or <u>number in each group</u>.**
- **Yesterday we solved division problems and found __________.**

Let's Talk:

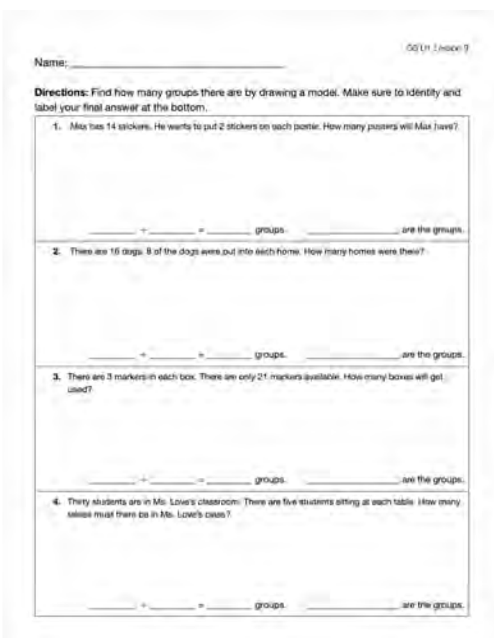
Story problems have all the information we need. We just have to find it.

What information did we need to solve division problems yesterday?

Let's Think:

There is $10. Each kid gets $2. How many kids are there?

Let's Try It:



Name: ______________________

Directions: Find how many groups there are by drawing a model. Make sure to identify and label your final answer at the bottom.

1. Max has 14 stickers. He wants to put 2 stickers on each poster. How many posters will Max have?

_____ ÷ _____ = _____ groups. __________ are the groups.

2. There are 16 dogs. 8 of the dogs were put into each home. How many homes were there?

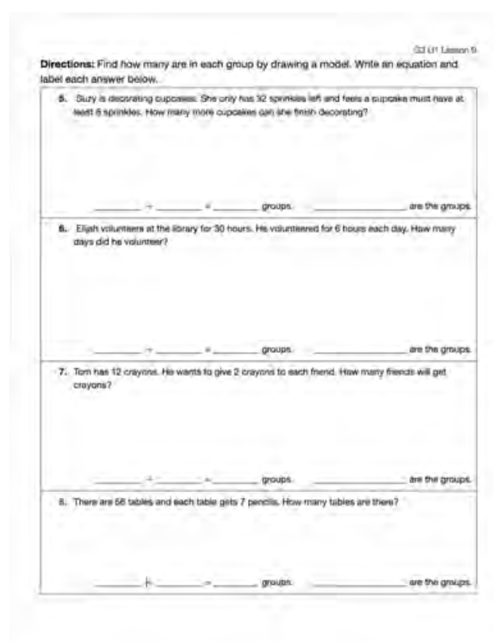
_____ ÷ _____ = _____ groups. __________ are the groups.

3. There are 3 markers in each box. There are only 21 markers available. How many boxes will get used?

_____ ÷ _____ = _____ groups. __________ are the groups.

4. Thirty students are in Ms. Love's classroom. There are five students sitting at each table. How many tables must there be in Ms. Love's class?

_____ ÷ _____ = _____ groups. __________ are the groups.



G3 U1 Lesson 5

Directions: Find how many are in each group by drawing a model. Write an equation and label each answer below.

5. Suzy is decorating cupcakes. She only has 32 sprinkles left and feels a cupcake must have at least 6 sprinkles. How many more cupcakes can she finish decorating?

_____ ÷ _____ = _____ groups. __________ are the groups.

6. Elijah volunteers at the library for 30 hours. He volunteered for 6 hours each day. How many days did he volunteer?

_____ ÷ _____ = _____ groups. __________ are the groups.

7. Tom has 12 crayons. He wants to give 2 crayons to each friend. How many friends will get crayons?

_____ ÷ _____ = _____ groups. __________ are the groups.

8. There are 56 tables and each table gets 7 pencils. How many tables are there?

_____ ÷ _____ = _____ groups. __________ are the groups.

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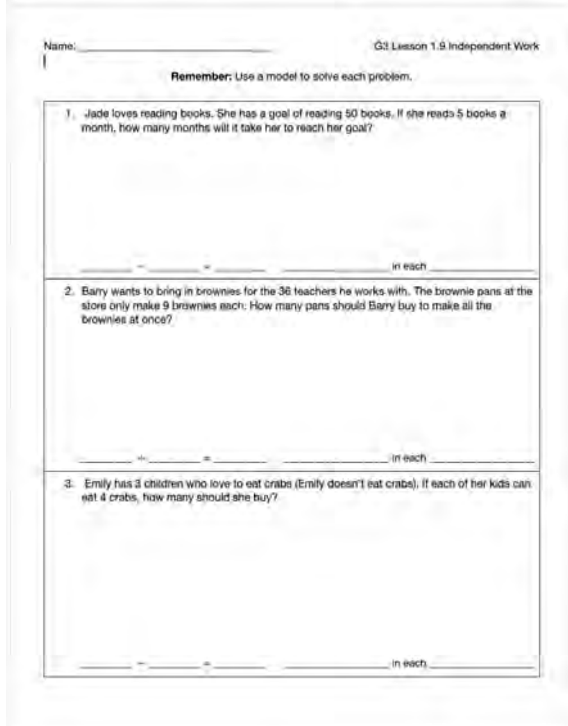
On your Own:


Name: ____________________

G3 Lesson 1.9 Independent Work

Remember: Use a model to solve each problem.

1. Jade loves reading books. She has a goal of reading 50 books. If she reads 5 books a month, how many months will it take her to reach her goal?

_______ ÷ _______ = _______ _______________ in each _______________

2. Barry wants to bring in brownies for the 36 teachers he works with. The brownie pans at the store only make 9 brownies each. How many pans should Barry buy to make all the brownies at once?

_______ ÷ _______ = _______ _______________ in each _______________

3. Emily has 3 children who love to eat crabs (Emily doesn't eat crabs). If each of her kids can eat 4 crabs, how many should she buy?

_______ ÷ _______ = _______ _______________ in each _______________

Name: ______________________________

Directions: Find how many groups there are by drawing a model. Make sure to identify and label your final answer at the bottom.

1. Max has 14 stickers. He wants to put 2 stickers on each poster. How many posters should Max buy? ________ ÷ ________ = ________ groups. ________________ are the groups.
2. There are 16 dogs. 8 of the dogs were put into each home. How many homes were there? ________ ÷ ________ = ________ groups. ________________ are the groups.
3. There are 3 markers in each box. There are only 21 markers available. How many boxes will get used? ________ ÷ ________ = ________ groups. ________________ are the groups.
4. Thirty students are in Ms. Love's classroom. There are five students sitting at each table. How many tables must there be in Ms. Love's class? ________ ÷ ________ = ________ groups. ________________ are the groups.

Directions: Find how many are in each group by drawing a model. Write an equation and label each answer below.

5. Suzy is decorating cupcakes. She only has 32 sprinkles left and feels a cupcake must have at least 8 sprinkles. How many more cupcakes can she finish decorating?

__________ ÷ __________ = __________ groups. ____________________ are the groups.

6. Elijah volunteers at the library for 30 hours. He volunteered for 6 hours each day. How many days did he volunteer?

__________ ÷ __________ = __________ groups. ____________________ are the groups.

7. Tom has 12 crayons. He wants to give 2 crayons to each friend. How many friends will get crayons?

__________ ÷ __________ = __________ groups. ____________________ are the groups.

8. There are 56 pencils and each table gets 7 pencils. How many tables are there?

__________ ÷ __________ = __________ groups. ____________________ are the groups.

Remember: Use a model to solve each problem.

1. Jade loves reading books. She has a goal of reading 50 books. If she reads 5 books a month, how many months will it take her to reach her goal?

_________ ÷ _________ = _________ ______________

2. Barry wants to bring in brownies for the 36 teachers he works with. The brownie pans at the store only make 9 brownies each. How many pans should Barry buy to make all the brownies at once?

_________ ÷ _________ = _________ ______________

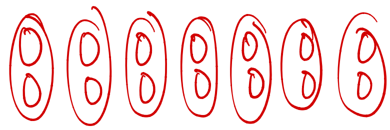
3. Emily's children love to eat crabs (Emily doesn't eat crabs). If each of her kids can eat 4 crabs, and she only purchased 12 crabs, how many children must Emily have?

_________ ÷ _________ = _________ ______________

Name: ______________________________ G3 Lesson 1-9 Let's Try It

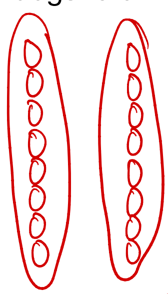
Directions: Find how many groups there are by drawing a model. Make sure to identify and label your final answer at the bottom.

1. Max has 14 stickers. He wants to put 2 stickers on each poster. How many posters should Max buy?



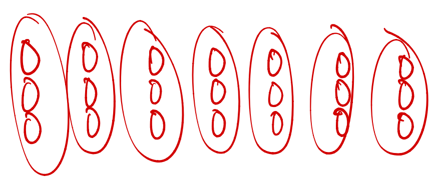
14 ÷ 2 = 7 groups. Posters are the groups.

2. There are 16 dogs. 8 of the dogs were put into each home. How many homes were there?



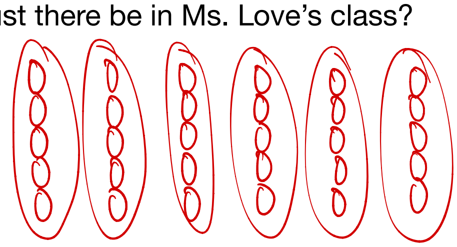
16 ÷ 8 = 2 groups. Homes are the groups.

3. There are 3 markers in each box. There are only 21 markers available. How many boxes will get used?



21 ÷ 3 = 7 groups. Boxes are the groups.

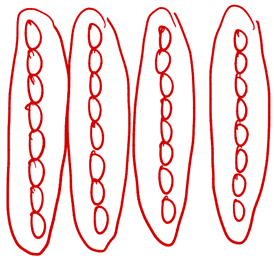
4. Thirty students are in Ms. Love's classroom. There are five students sitting at each table. How many tables must there be in Ms. Love's class?



30 ÷ 5 = 6 groups. Tables are the groups.

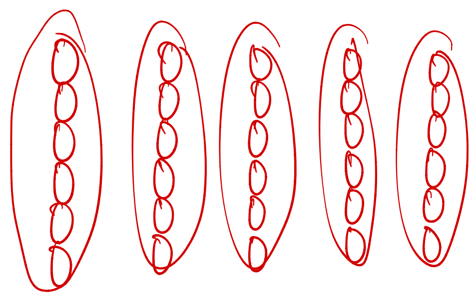
Directions: Find how many are in each group by drawing a model. Write an equation and label each answer below.

5. Suzy is decorating cupcakes. She only has 32 sprinkles left and feels a cupcake must have at least 8 sprinkles. How many more cupcakes can she finish decorating?



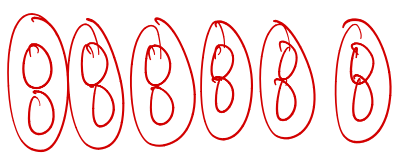
32 ÷ 8 = 4 groups. Cupcakes are the groups.

6. Elijah volunteers at the library for 30 hours. He volunteered for 6 hours each day. How many days did he volunteer?



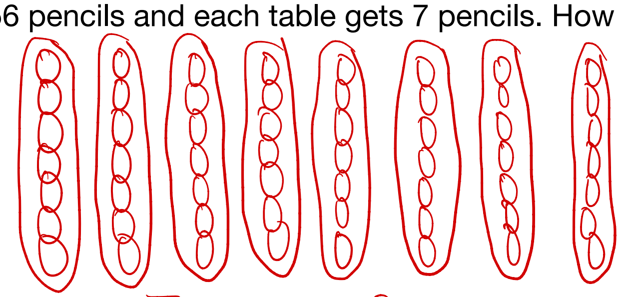
30 ÷ 6 = 5 groups. Days are the groups.

7. Tom has 12 crayons. He wants to give 2 crayons to each friend. How many friends will get crayons?



12 ÷ 2 = 6 groups. Friends are the groups.

8. There are 56 pencils and each table gets 7 pencils. How many tables are there?

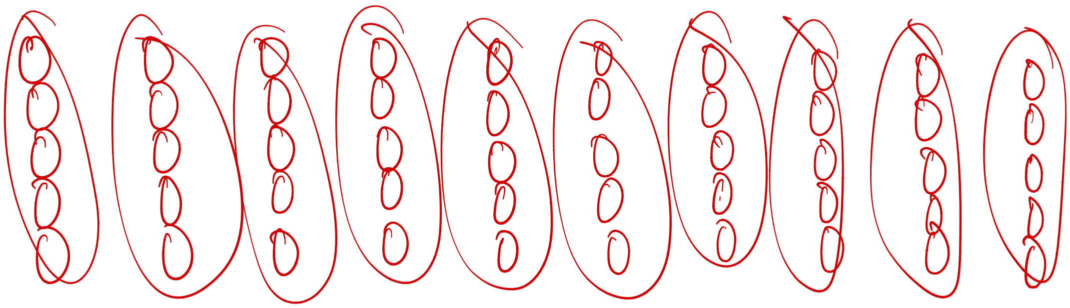


56 ÷ 7 = 8 groups. Tables are the groups.

Name: ______________________________ G3 Lesson 1-9 Independent Work

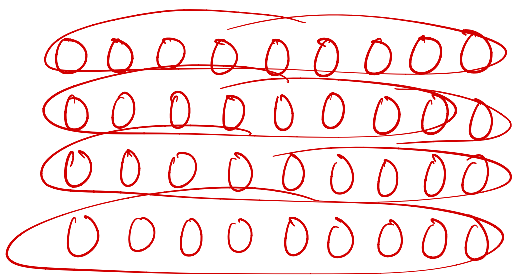
Remember: Use a model to solve each problem.

1. Jade loves reading books. She has a goal of reading 50 books. If she reads 5 books a month, how many months will it take her to reach her goal?



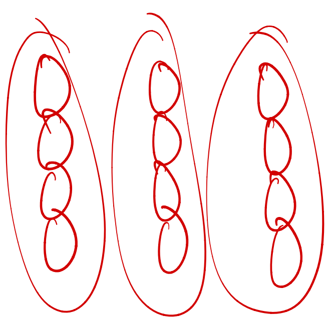
50 ÷ 5 = 10 months

2. Barry wants to bring in brownies for the 36 teachers he works with. The brownie pans at the store only make 9 brownies each. How many pans should Barry buy to make all the brownies at once?



36 ÷ 9 = 4 pans

3. Emily's children love to eat crabs (Emily doesn't eat crabs). If each of her kids can eat 4 crabs, and she only purchased 12 crabs, how many children must Emily have?



12 ÷ 4 = 3 kids

G3 U1 Lesson 10

Represent division as repeated subtraction

G3 U1 Lesson 10 - Students will represent division with repeated subtraction

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): We've been learning about division for the past four days by drawing models. There's one more way to represent division that you're going to learn about today.

Let's Review (Slide 3): Once again, let's see if you can help me fill in the blanks.

- Division is the **opposite/inverse** of multiplication
- Multiplication is the same as **repeated addition**.

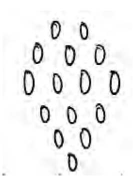
Correct, multiplication is the same as repeated addition because as we count the number of total pieces we add each equal group. The addition repeats since the numbers we add are the same because the groups are equal.

Let's Talk (Slide 4): Let's start by thinking about division and subtraction. Think about everything we've been doing the last few days with division and I'm wondering if you see any connections between division and subtraction. **How are division and subtraction similar and how are they different?** Possible Student Answers, Key Points:

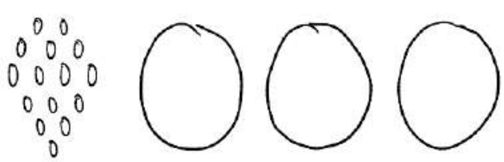
- Both involve taking away from the whole.
- Both are taking apart.
- When we're subtracting, we're starting with a whole amount and taking away a smaller amount.
- With division, we're also start with the whole amount but taking away the same amount over and over again.

These are interesting connections you all are making! I think you're onto something with those ideas, today we're going to explore how division is related to subtraction.

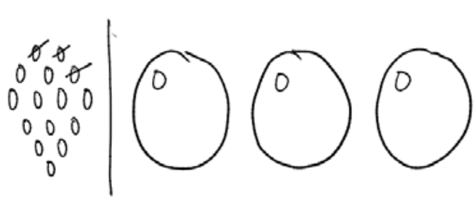
Let's Think (Slide 5): Let's get into this problem that we solved yesterday but let's focus on answering the question of "Is division repeated subtraction?"



I'm going to do something that I don't normally do, which is draw my total. How many circles should I draw if I'm drawing my total? 15. Correct, my total is 15.



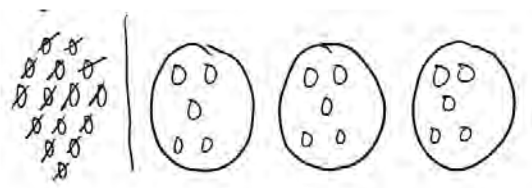
Now I'm going to break up my total into 3 groups like the problem says. What should I do next if I'm going to break up my total into 3 groups? Draw 3 groups. Correct! I can start with my empty groups since they told me how many there are. Now I'm ready to split the total into my groups.



So, I'm going to put one in each group until you get to 15. Hmmm, but when I put one in each group, the circles don't come from nowhere, they come from the total. So when I put one in each group, I'm going to cross them out of my total. I'm going to start by putting one in each group: I'm going to put one in this group, I'm going to put one in this group and one in this group since they all have to be equal *(draw one circle in each group and stop).* Wait, I just put 3 circles in the groups, those circles came from my total, so I need to show that by crossing them out from my total. It's like if I was dealing cards, once I give the cards to players, they're no longer in the deck, they're gone from the total.

$$\begin{array}{r} 15 \\ -3 \\ \hline 12 \end{array}$$

Look, I just took 3 from my total and put them in my groups. I'm going to show that using an equation. I started with 15 and I took away 3 for the three groups. What math symbol shows "take away?" Minus. Now, I'm left with 12 circles in my total.



Now, like we did on previous days, I'm going to keep going until I am done passing out the total. I'll pass out another 3 and cross them out. And another 3 and cross them out (*continue until 0 are left*). I can stop now because I've reached my total. I know I've given out all 15 because there are no circles left in my drawing of the total.

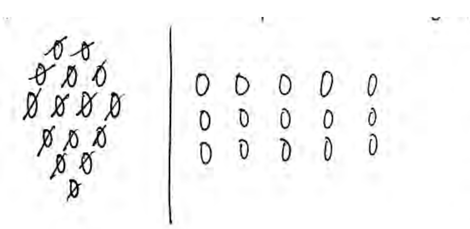
$$\begin{array}{r} 15 \\ -3 \\ \hline 12 \\ -3 \\ \hline 9 \\ -3 \\ \hline 6 \end{array} \quad \begin{array}{r} 6 \\ -3 \\ \hline 3 \\ -3 \\ \hline 0 \end{array}$$

Now let me show you what I just did with an equation. I started with 15 and I took away 3 (*point to the first object in each group*), and that left me with 12. Then I took another 3 and passed them out. I kept taking away three until there were zero left. Everytime we make a group when we're dividing, we're actually subtracting from the total. Because we're making equal groups, we always subtract the same amount. The subtraction repeats when we take away the same amount over and over again.

However, we're still not done. We need to figure out how many are in each group. If we look at the model, we can count how many are in each group, let's count…1, 2, 3, 4, 5…1, 2, 3, 4, 5…1, 2, 3, 4, 5. There are 5 in each group.

$$\begin{array}{r} 15 \\ -3 \\ \hline 12 \\ -3 \\ \hline 9 \\ -3 \\ \hline 6 \end{array} \quad \begin{array}{r} 6 \\ -3 \\ \hline 3 \\ -3 \\ \hline 0 \end{array}$$

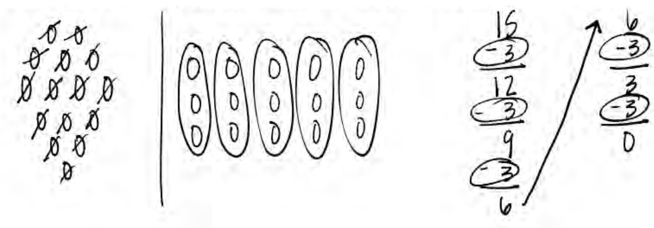
In the model, we can see that there's 5 in each group. When we look at repeated subtraction, each time we subtracted, we put 1 in each group. If we count up how many times we subtracted, we'll see how many are in each group. I'm going to circle each time we subtracted, each time it says "-3."We subtracted three 5 times. That means we put one in each group 5 times, we put 5 in each group, the answer is 5.



$$\begin{array}{r} 15 \\ -3 \\ \hline 12 \\ -3 \\ \hline 9 \\ -3 \\ \hline 6 \end{array} \quad \begin{array}{r} 6 \\ -3 \\ \hline 3 \\ -3 \\ \hline 0 \end{array}$$

It even works when we divide the other way. Watch. I'll start again with 15. I'm going to make a group of 3 and subtract 3 from my total. This time I'm making groups of 3 instead of starting with 3 groups. I'm going to make my first group, 1, 2, 3 *(draw 3 circles in a row)*. Where did my 3 come from? The total. What equation can show what we just did in our model? 15 - 3 = 12. Correct, we took 3 from our total 15 and now there are 12 left.

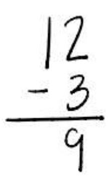
How do I know it's time to stop? There are no more circles left in your total in the picture and the subtraction reached 0. Yes, both our equation and our subtraction show us there are no more left in our total to take from.



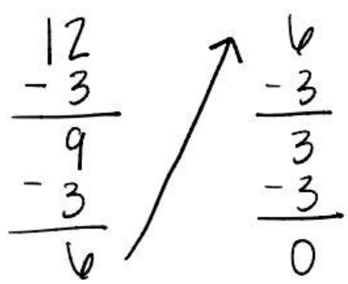
However, we're still not done. We need to figure out how many groups there are. If we look at the model, we can count that there are 1, 2, 3, 4, 5 groups *(circle each group as you count).* In the model, we can see that there are 5 groups. How do we find our how many groups there are in the repeated subtraction? Count how many times we subtracted 3.

Yes, when we look at the repeated subtraction, each time we subtracted, we made a group of 3. If we count up how many times we subtracted 3, we'll see how many groups we made. I'm going to circle each time we subtracted, each time it says "-3." Count with me…1, 2, 3, 4, 5. The answer is 5 again, even though this time it's 5 groups instead of 5 in each group.

Let's Think (Slide 6): Let me show you one more. But this time, we'll just do the repeated subtraction, without the model. We need to break apart 12 into groups of 3.



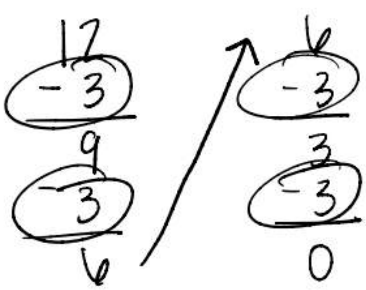
In division AND subtraction, what do we always begin with? Our total. Right, I'll begin with my total of 12. If we were to draw a model, I would take 3 from the total to make a group. I won't draw it, I'll just subtract 3 from the total. I still have 9 left in my total that I can use to make more groups of 3, I'm going to keep subtracting. How will we know when to stop? When we get to 0. Correct, then there will be none left in our total.



I'll subtract 3 again to make a group of 3. Now I have 6 left.

I'll subtract 3 again and make a group of 3. Now I have 3 left, I'll subtract 3 again and make a group of 3.

Now I have none left. How do we figure out how many groups of 3 we made? We count each time we subtracted 3.



So, let's go through and circle each time we subtracted 3 to make a group of 3. Count with me… 1, 2, 3, 4. We circled 4 groups.

Let's finish by writing our division equation. We started with 12and broke it apart into groups of 3 and we did that 4 times. So, 12 divided by 3 is 4.

Let's Try It (Slide 7-8): Let's try some together. Remember we're still dividing, but instead of drawing a picture, we'll subtract the same amount until we get to zero to find the answer.

WARM WELCOME

Today we will represent division with repeated subtraction.

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Let's Review:

- **Division is the __________ of multiplication.**

- **Multiplication is the same as __________ addition.**

Let's Talk:

How are subtraction and division similar?
How are they different?

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Let's Talk:

Is division repeated subtraction?

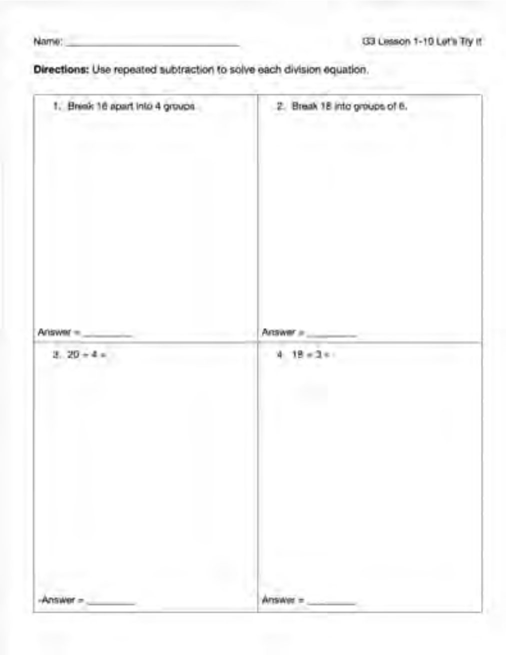
Break apart 15 into 3 groups.	Break apart 15 into groups of 3.

Let's Think:

Break apart 12 into groups of 3.

Division Number Sentence: ______________________________

Let's Try It:


Name: ____________ G3 Lesson 1-10 Let's Try It

Directions: Use repeated subtraction to solve each division equation.

1. Break 16 apart into 4 groups

Answer = ________

2. Break 18 into groups of 6.

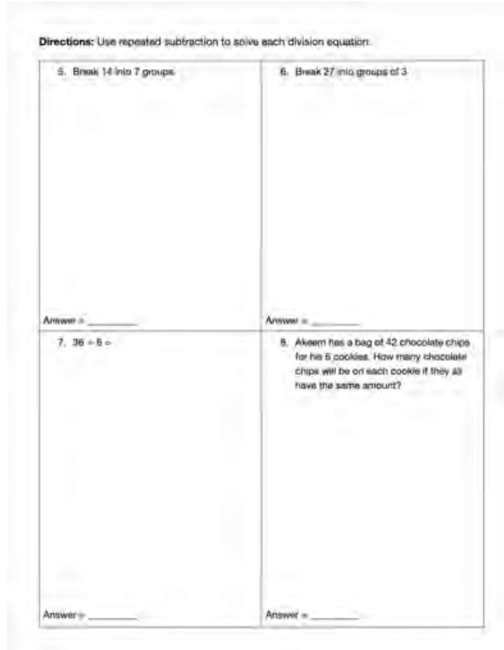
Answer = ________

3. $20 \div 4 =$

Answer = ________

4. $18 \div 3 =$

Answer = ________


Directions: Use repeated subtraction to solve each division equation.

5. Break 14 into 7 groups.

Answer = ________

6. Break 27 into groups of 3

Answer = ________

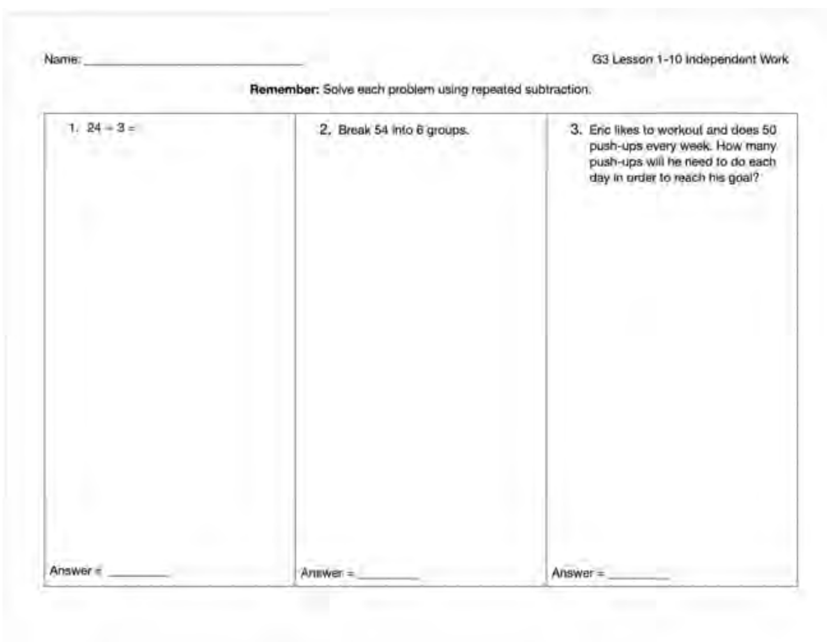
7. $36 \div 6 =$

Answer = ________

8. Akeem has a bag of 42 chocolate chips for his 6 cookies. How many chocolate chips will be on each cookie if they all have the same amount?

Answer = ________

On your Own:


Name: ____________ G3 Lesson 1-10 Independent Work

Remember: Solve each problem using repeated subtraction.

1. $24 \div 3 =$

Answer = ________

2. Break 54 into 6 groups.

Answer = ________

3. Eric likes to workout and does 50 push-ups every week. How many push-ups will he need to do each day in order to reach his goal?

Answer = ________

Directions: Use repeated subtraction to solve each division equation.

1. Break 16 apart into 4 groups Answer = __________	2. Break 18 into groups of 6. Answer = __________
3. 20 ÷ 4 = -Answer = __________	4. 18 ÷ 3 = Answer = __________

Directions: Use repeated subtraction to solve each division equation.

5. Break 14 into 7 groups. Answer = __________	6. Break 27 into groups of 3 Answer = __________
7. 36 ÷ 6 = Answer = __________	8. Akeem has a bag of 42 chocolate chips for his 6 cookies. How many chocolate chips will be on each cookie if they all have the same amount? Answer = __________

Name: ______________________________

Remember: Solve each problem using repeated subtraction.

1. $24 \div 3 =$ Answer = __________	2. Break 54 into 6 groups. Answer = __________	3. Eric likes to workout and does 28 push-ups every week. How many push-ups will he need to do each day in order to reach his goal? (Remember how many days are in a week). Answer = __________

Name: ______________________________ G3 Lesson 1-10 Let's Try It

Directions: Use repeated subtraction to solve each division equation.

1. Break 16 apart into 4 groups

$$\begin{array}{r} 16 \\ -4 \\ \hline 12 \\ -4 \\ \hline 8 \\ -4 \\ \hline 4 \\ -4 \\ \hline 0 \end{array}$$

Answer = 4

2. Break 18 into groups of 6.

$$\begin{array}{r} 18 \\ -6 \\ \hline 12 \\ -6 \\ \hline 6 \\ -6 \\ \hline 0 \end{array}$$

Answer = 3

3. 20 ÷ 4 =

$$\begin{array}{r} 20 \\ -4 \\ \hline 16 \\ -4 \\ \hline 12 \\ -4 \\ \hline 8 \\ -4 \\ \hline 4 \\ -4 \\ \hline 0 \end{array}$$

-Answer = 5

4. 18 ÷ 3 =

$$\begin{array}{r} 18 \\ -3 \\ \hline 15 \\ -3 \\ \hline 12 \\ -3 \\ \hline 9 \\ -3 \\ \hline 6 \\ -3 \\ \hline 3 \\ -3 \\ \hline 0 \end{array}$$

Answer = 6

Directions: Use repeated subtraction to solve each division equation.

5. Break 14 into 7 groups.

14
− 7
7
− 7
0

Answer = 2

6. Break 27 into groups of 3

27
− 3
24
− 3
21
− 3
18
− 3
15

15
− 3
12
− 3
9
− 3
6
− 3
3
− 3
0

Answer = 9

7. 36 ÷ 6 =

36
− 6
30
− 6
24
− 6
18
− 6
12

12
− 6
6
− 6
0

Answer = 6

8. Akeem has a bag of 42 chocolate chips for his 6 cookies. How many chocolate chips will be on each cookie if they all have the same amount?

42
− 6
36
− 6
30
− 6
24

24
− 6
18
− 6
12
− 6
6

6
− 6
0

Answer = 7

Name: ______________________________ G3 Lesson 1-10 Independent Work

Remember: Solve each problem using repeated subtraction.

1. 24 ÷ 3 =

24
− 3
21
− 3
18
− 3
15
− 3
12
− 3
9
− 3
6
− 3
3
− 3
0

Answer = 8

2. Break 54 into 6 groups.

54
− 6
48
− 6
42
− 6
36
− 6
30
− 6
24
− 6
18

18
− 6
12
− 6
6
− 6
0

Answer = 9

3. Eric likes to workout and does 28 push-ups every week. How many push-ups will he need to do each day in order to reach his goal? (Remember how many days are in a week).

28
− 7
21
− 7
14
− 7
7
− 7
0

Answer = 4

G3 U1 Lesson 11

Solve division and multiplication story problems

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G3 U1 Lesson 11 - Students will solve division and multiplication story problems

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): We've spent a few days working on multiplication and a few days working on division. We're going to spend today working with both multiplication and division. Even though you've gotten pretty good at working with each separately, working with them together can be tricky.

Let's Talk (Slide 3): Tell me everything you know about multiplication and division. Possible Student Answers/Key Points:

- Division is the opposite/inverse of multiplication.
- Multiplication and division both use equal groups.
- They both have a total, a number of groups and an equal amount in each group.
- Multiplication uses equal groups to find the total.
- Division uses equal groups to find the number of groups or number in each group.
- Multiplication is the same as repeated addition.
- Division is the same as repeated subtraction.

You know so much about multiplication and division. You're right, they have a lot in common. However they are different in important ways. We use multiplication to find the total. We are given the number of groups and amount in each group and we use that to find the total. We use division to find the number of groups or number in each group. We are given the total and must break it up to find the number of groups or number in each group.

Let's Review (Slide 4): Let's look at an example of this. We use multiplication to find the total. Here we are given the number of groups, 3 groups, the number in each group, 5 in each group and we use that to find the total. And, 3x5 is 15. So the total is 15. But, division is the opposite. We use division to find the number of groups or number in each group. We are given the total,15 and must break it up into 3 groups or groups of 3, to find the number of groups or number in each group. There are either 5 groups of 5 in each group.

Today you'll be solving word problems, so you won't know if they're multiplication word problems or division word problems. You'll have to figure out which kind of math to do based on the information they give you and the answer they want you to find. If they give you the groups (point) and number in each group *(point)* and they ask you to find the total *(point)*, we should multiply *(point)*. If they give you the total *(point)* and want you to break it up *(point)*, we should divide *(point)*. It's important to do the right math.

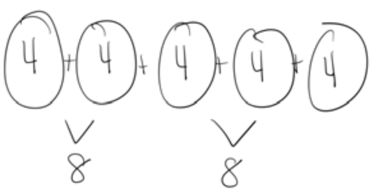
Let's Think (Slide 5): I always start by reading the story out loud, read it with me… "Your class is having a pizza party. You buy 5 pizzas. Each pizza has 6 slices. How many slices are there?" Now, let's retell the story in our own words to make sure we understand it. So, there's a party with 5 pizzas. Each pizza was cut into 4 slices. I need to figure out how many slices there are from all the pizzas.

Now I need to figure out the kind of math I need to do. I can do that by drawing a model of the information I've been given.

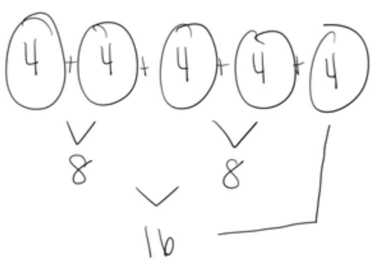
I know there are 5 pizzas. I'm going to draw 5 circles to show pizzas. Count with me: 1, 2, 3, 4, 5. There, we have 5 pizzas.

The story says that each pizza has 4 slices. How can I show that each pizza has 4 slices? Draw a 4 in each circle/draw 4 objects in each circle. Yes, I'll write a 4 in each circle to quickly show that there are 4 slices in each pizza…this pizza has 4 pieces, this one, this one, and this one.

Now I need to figure out what kind of math to do. My picture looks like 5 groups of 4. My 5 pizzas are my 5 groups and my 4 slices are the 4 in each group. They want me to figure out how many slices there are altogether. That's multiplication: they told me the groups and number in each group and I need to find the total.



What can we do to find the total quickly? Repeated addition. Yes, we can use repeated addition to solve multiplication. Let's start adding. Now that I have my repeated addition number sentence, I can add. I know 4 + 4 = 8 because I know my doubles facts. Now I have 8, 8 and 4.



I'm going to leave the 4 for later and add my 2 eights. Use your doubles facts, what's 8 + 8? 16. Correct, 16! Now what is our final step to solve? We add 16 to the 4 that is left. Yes, we can't forget about that 4.

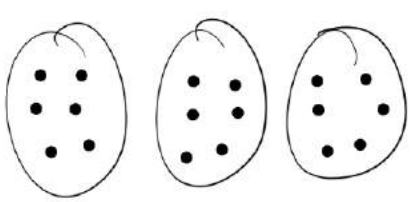
So, et's stack and add 16 + 4. Our final answer is 20. Do you remember what our 20 is, we have 20 what? We have 20 pizza slices altogether. Correct, there are 20 pizza slices altogether. Whenever you're solving word problems, it's important to remember what all your numbers represent. Not just 5, but 5 pizzas. Not just 4, but 4 slices in each pizza. Not just 20, but 20 slices of pizza altogether.

$5 \times 4 = 20$

The final answer is 20. Now I'm ready to write my equation. There were 5 pizzas and each pizza had 4 slices. There were 20 slices total. So, 5x4 is 20.

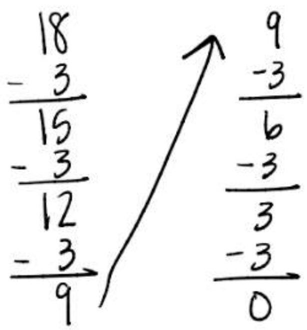
Let's Think (Slide 6): Let's try another. I always start by reading the story out loud, "Jade has 18 candy bars. She wants to put them into 3 bags and wants the same number in each bag. How many candy bars go in each bag?" Next I retell the story to make sure I understand it.

Now I need to figure out the kind of math I need to do. I can do that by drawing a model of the information I've been given. I'm starting with 18 bars and I'm going to put them into 3 bags. I'm going to draw 3 circles to show the 3 bags I need to fill with bars: 1 bag, 2 bags, 3 bags.

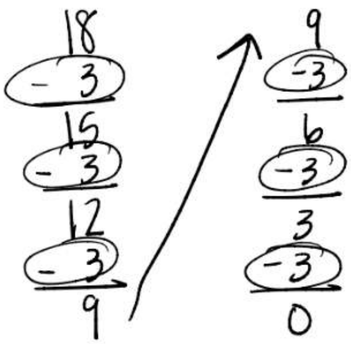


Next I need to split the bars into the bags evenly. Let's pause. What kind of math is it when we split up or break apart into equal groups? Division. Yes it's division because we're breaking apart the 18 total candy bars into 3 groups! I'm going to keep drawing my model to divide and then check my work with repeated subtraction. So, it looks like 6 candy bars go in each bag.

Let’s check that with repeated subtraction. We’ll start with my total of 18, then I need to keep subtracting 3 for the 3 candy bars I would take away when I put 1 into each bag. How do I know when to stop subtracting? When you get to 0 and there’s no more in your total. Yes, let's keep subtracting until we get to 0.



I’ll start with 18 and subtract 3, now I’m left with 15. I can keep going. I have 15 and subtract 3, now I’m left with 12. I can keep going. I have 12 and subtract 3, now I’m left with 9. I can keep going. I have 9 and subtract 3, now I’m left with 6. I can keep going. I have 6 and subtract 3, now I’m left with 3. I can keep going. I have 3 and subtract 3, now I’m left with 0. I can not keep going.



Are we finished solving? No, we need to circle all the times we took away 3. Great, let’s go back and circle each time we subtracted 3 and you count out loud: 1, 2, 3, 4, 5, 6. We subtracted 3 six times. Our answer is 6. But, 6 what? 6 candy bars in each bag. Correct, there are 6 candy bars in each bag.

$18 \div 3 = 6$

Now we’re ready to write our equation. We started with 18 candy bars and split them up into 3 bags equally. This left us with 6 candy bars in each bag. So, 18 divided by 3 is 6.

Let’s Try It (Slide 7-8): Let’s try some together. Remember, we can’t just start solving. We have to figure out the kind of math we need to use first and we can do that by reading carefully and retelling.

WARM WELCOME

Today we will solve division and multiplication story problems.

Let's Talk:

What do you know about multiplication and division?

Let's Review:

Multiplication	Division
3 x 5 = ______ **(groups) (# in each group) (total)**	**15 ÷ 3 = ______** **(total)** **(groups** or **# in each group)**

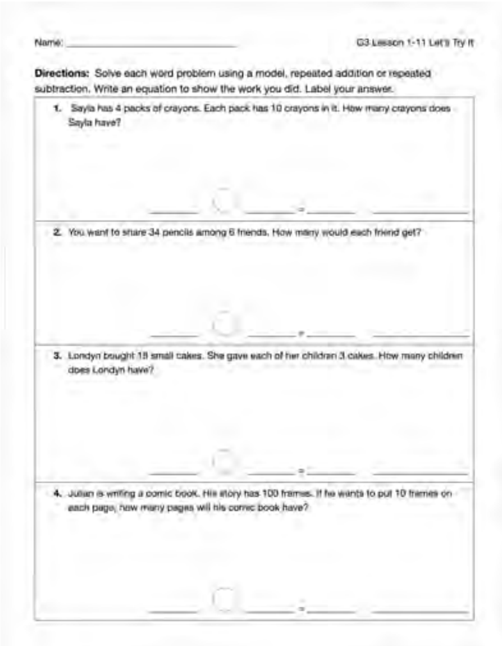
Let's Think:

Your class is having a pizza party. You buy 5 pizzas. Each pizza has 6 slices. How many slices are there?

Let's Think:

Jade has 18 candy bars. She wants to put them into 3 bags and wants the same number in each bag. How many candy bars go in each bag?

Let's Try It:



Name: ______________________ G3 Lesson 1-11 Let's Try It

Directions: Solve each word problem using a model, repeated addition or repeated subtraction. Write an equation to show the work you did. Label your answer.

1. Sayla has 4 packs of crayons. Each pack has 10 crayons in it. How many crayons does Sayla have?

   ______ ◯ ______ = ______ ____________

2. You want to share 34 pencils among 6 friends. How many would each friend get?

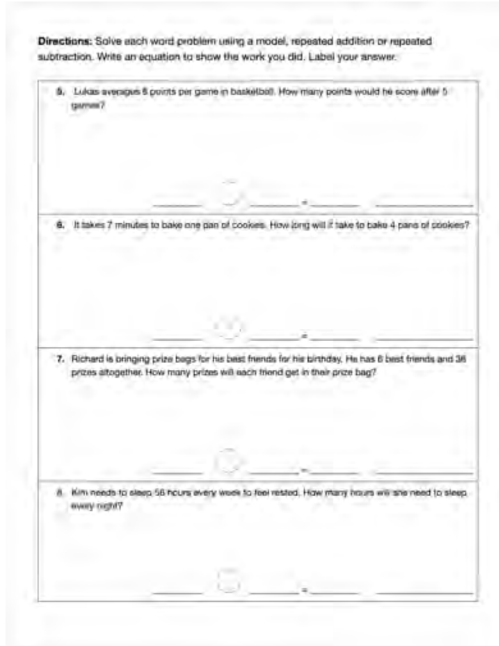
   ______ ◯ ______ = ______ ____________

3. Londyn bought 18 small cakes. She gave each of her children 3 cakes. How many children does Londyn have?

   ______ ◯ ______ = ______ ____________

4. Julian is writing a comic book. His story has 100 frames. If he wants to put 10 frames on each page, how many pages will his comic book have?

   ______ ◯ ______ = ______ ____________



Directions: Solve each word problem using a model, repeated addition or repeated subtraction. Write an equation to show the work you did. Label your answer.

5. Lukas averages 8 points per game in basketball. How many points would he score after 5 games?

   ______ ◯ ______ = ______ ____________

6. It takes 7 minutes to bake one pan of cookies. How long will it take to bake 4 pans of cookies?

   ______ ◯ ______ = ______ ____________

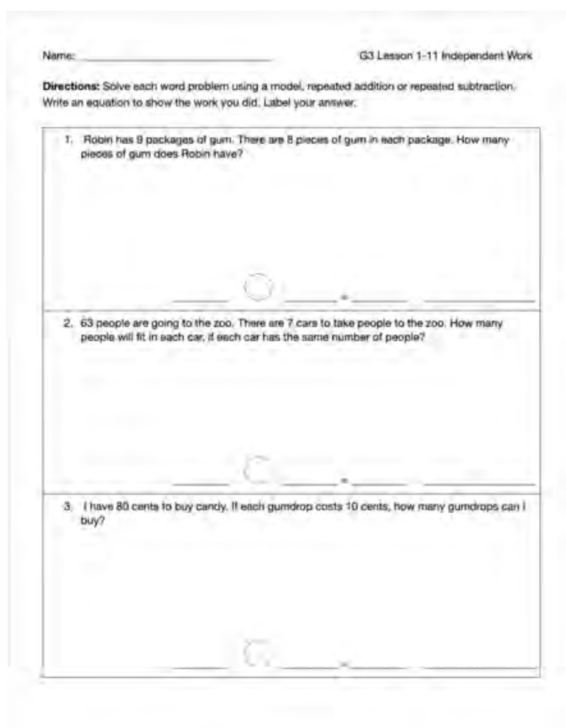
7. Richard is bringing prize bags for his best friends for his birthday. He has 6 best friends and 36 prizes altogether. How many prizes will each friend get in their prize bag?

   ______ ◯ ______ = ______ ____________

8. Kim needs to sleep 56 hours every week to feel rested. How many hours will she need to sleep every night?

   ______ ◯ ______ = ______ ____________

On your Own:



Name: ______________________ G3 Lesson 1-11 Independent Work

Directions: Solve each word problem using a model, repeated addition or repeated subtraction. Write an equation to show the work you did. Label your answer.

1. Robin has 9 packages of gum. There are 8 pieces of gum in each package. How many pieces of gum does Robin have?

   ______ ◯ ______ = ______ ____________

2. 63 people are going to the zoo. There are 7 cars to take people to the zoo. How many people will fit in each car, if each car has the same number of people?

   ______ ◯ ______ = ______ ____________

3. I have 80 cents to buy candy. If each gumdrop costs 10 cents, how many gumdrops can I buy?

   ______ ◯ ______ = ______ ____________

Name: ___________________________________

Directions: Solve each word problem using a model, repeated addition or repeated subtraction. Write an equation to show the work you did. Label your answer.

1. Sayla has 4 packs of crayons. Each pack has 10 crayons in it. How many crayons does Sayla have?

__________ ◯ __________ = __________ ____________________

2. You want to share 36 pencils among 6 friends. How many would each friend get?

__________ ◯ __________ = __________ ____________________

3. Londyn bought 18 small cakes. She gave each of her children 3 cakes. How many children does Londyn have?

__________ ◯ __________ = __________ ____________________

Directions: Solve each word problem using a model, repeated addition or repeated subtraction. Write an equation to show the work you did. Label your answer.

4. Julian is writing a comic book. His story has 100 frames. If he wants to put 10 frames on each page, how many pages will his comic book have?

________ ◯ ________ = ________ ____________

5. Lukas averages 8 points per game in basketball. How many points would he score after 5 games?

________ ◯ ________ = ________ ____________

6. It takes 7 minutes to bake one pan of cookies. How long will it take to bake 4 pans of cookies?

________ ◯ ________ = ________ ____________

Directions: Solve each word problem using a model, repeated addition or repeated subtraction. Write an equation to show the work you did. Label your answer.

1. Robin has 5 packages of gum. There are 8 pieces of gum in each package. How many pieces of gum does Robin have?

_________ ◯ _________ = _________ ___________________

2. 63 people are going to the zoo. There are 7 cars to take people to the zoo. How many people will fit in each car, if each car has the same number of people?

_________ ◯ _________ = _________ ___________________

3. I have 50 cents to buy candy. If each gumdrop costs 10 cents, how many gumdrops can I buy?

_________ ◯ _________ = _________ ___________________

Name: ______________________________ G3 Lesson 1-11 Let's Try It

Directions: Solve each word problem using a model, repeated addition or repeated subtraction. Write an equation to show the work you did. Label your answer.

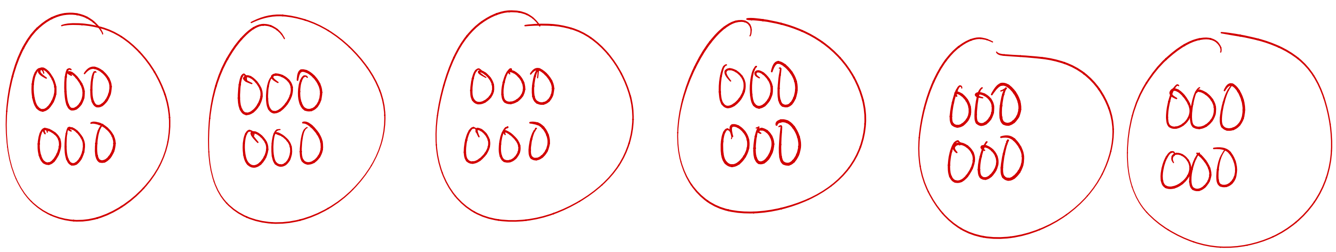
1. Sayla has 4 packs of crayons. Each pack has 10 crayons in it. How many crayons does Sayla have?

10 10 → 20   10 10 → 20

$$\begin{array}{r} 20 \\ +\ 20 \\ \hline 40 \end{array}$$

4 × 10 = 40 total crayons

2. You want to share 36 pencils among 6 friends. How many would each friend get?



36 ÷ 6 = 6 pencils per friend

3. Londyn bought 18 small cakes. She gave each of her children 3 cakes. How many children does Londyn have?

$$\begin{array}{r} 18 \\ -3 \\ \hline 15 \\ -3 \\ \hline 12 \end{array} \quad \begin{array}{r} 12 \\ -3 \\ \hline 9 \\ -3 \\ \hline 6 \end{array} \quad \begin{array}{r} 6 \\ -3 \\ \hline 3 \\ -3 \\ \hline 0 \end{array}$$

18 ÷ 3 = 6 children

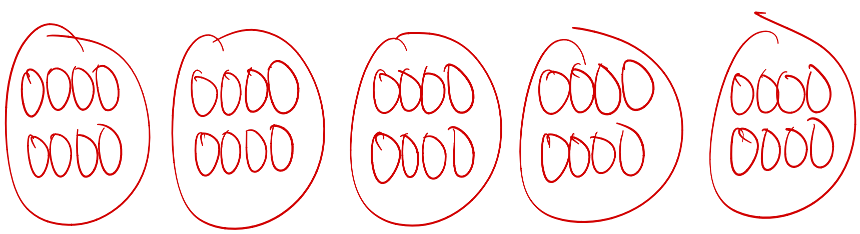
Directions: Solve each word problem using a model, repeated addition or repeated subtraction. Write an equation to show the work you did. Label your answer.

4. Julian is writing a comic book. His story has 100 frames. If he wants to put 10 frames on each page, how many pages will his comic book have?

100 − 10 = 90
90 − 10 = 80
80 − 10 = 70
70 − 10 = 60
60 − 10 = 50
50 − 10 = 40
40 − 10 = 30
30 − 10 = 20
20 − 10 = 10
10 − 10 = 0

100 ÷ 10 = 10 pages

5. Lukas averages 8 points per game in basketball. How many points would he score after 5 games?



5 × 8 = 40 points total

6. It takes 7 minutes to bake one pan of cookies. How long will it take to bake 4 pans of cookies?

7 + 7 + 7 + 7

14　　14

14 + 14 = 28

4 × 7 = 28 minutes total

Name: ______________________________ G3 Lesson 1-11 Independent Work

Directions: Solve each word problem using a model, repeated addition or repeated subtraction. Write an equation to show the work you did. Label your answer.

1. Robin has 5 packages of gum. There are 8 pieces of gum in each package. How many pieces of gum does Robin have?

$8 + 8 + 8 + 8 + 8$

16 16

32

$16 + 16 = 32$

$32 + 8 = 40$

5 × 8 = 40 total pieces

2. 63 people are going to the zoo. There are 7 cars to take people to the zoo. How many people will fit in each car, if each car has the same number of people?

63 − 7 = 56
56 − 7 = 49
49 − 7 = 42
42 − 7 = 35
35 − 7 = 28
28 − 7 = 21
21 − 7 = 14
14 − 7 = 7
7 − 7 = 0

63 ÷ 7 = 9 people per car

3. I have 50 cents to buy candy. If each gumdrop costs 10 cents, how many gumdrops can I buy?

50 − 10 = 40
40 − 10 = 30
30 − 10 = 20
20 − 10 = 10
10 − 10 = 0

50 ÷ 10 = 5 gumdrops

G3 U1 Lesson 12

Explore how multiplication and division are connected

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G3 U1 Lesson 12 - Students will explore how multiplication and division are related

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): Today we'll take another look at how multiplication and division are connected, or related. But of course, we're first going to review all that you already know about how they're related to each other.

Let's Talk (Slide 3): You've been learning about multiplication and division for weeks now, you know so much about both kinds of math. Before we jump into our lesson, **I want to hear how you think multiplication and division are connected?**

- They both use equal groups.
- They are opposites.
- They both use something repeated (addition/subtraction)
- Both have a total, groups and number in each group.

Up until this point, we've seen that multiplication and division both have a total, a number of groups and an amount in each group.

Let's Talk (Slide 4): Let's look at the model here. Let's first describe it in words. There are 2 groups of 3. Correct! There are 2 groups of 3. Let's write those words as a multiplication expression and include the total. So, "groups of" is the same as the multiplication sign. So we can write 2 x 3 = 6, in other words there are 6 total in the 2 groups. Now let's write a division equation to represent the same picture. We know that with division, we start with the total. So the total is 6 and we divided it into 2 groups with 3 in each group. So we can write, 6 divided by 2 equals 3.

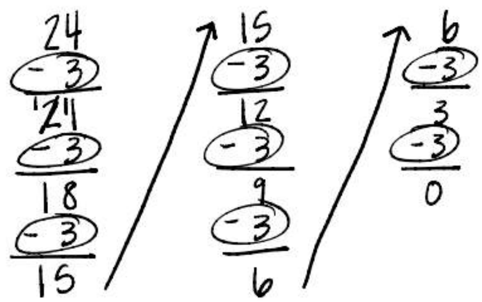
Now that we have both our equations. **What do you notice is similar about the equations? What do you notice is different?** Possible Student Answers/Key Points:

- The equations are similar because they have all the same numbers. They both have 2, 3, and 6.
- The equations are different because the numbers are in different places and use different symbols.
- The multiplication equation starts with the groups or amount in each group.
- The division equation starts with the total.
- This reminds me of fact families in first and second grade like 1+3=4 and 4-1=3.

Wow, those are some really big ideas! These equations are related because they share the same numbers and relationships. They both have a total of 6 circles, in 2 groups with 3 in each group. But, they are different because the information is just presented differently.

In the multiplication equation, we start by describing the groups and amount in each group. Then we find the total. In the division equation we start with the total and number of groups and find out how many are in each group. Even though the equations look different, they actually describe the same information. These equations are opposites or inverses. We're going to work today to find inverse equations that are related to each other.

Let's Think (Slide 5): They've given me an incomplete equation and want me to find the inverse. First, I need to solve the equation they've given me before I find the inverse. How can I solve this equation? Repeated subtraction. Correct, let's set up our repeated subtraction.



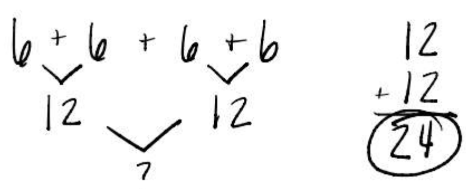
How do we begin? We start with 24 and subtract 3. Correct! and we'll keep going until we get to 0. We have 24 and subtract 3, now we have 21 (*continue narrating as you subtract to zero*). Whew, we finally got to zero. Now we need to go back and count how many times we took away three. Ready? I'll circle, while you count: 1, 2, 3, 4, 5, 6, 7, 8. We subtracted three 8 times. Our answer is 8. We can finish the equation they gave us. So, 24 divided by 3 is 8. Now we need to find the inverse.

Our inverse equation will be a multiplication fact. We know multiplication equations say " ____ groups of _____ equals _____". We know there are 8 groups of 3 because I circled 8 groups of 3 in my repeated subtraction. See, 1, 2, 3, 4, 5, 6, 7, 8 *(point to each group you subtracted)*. 8 groups and each of them was 3. I know my total is 24 because that's what I started my repeated subtraction with.

$8 \times 3 = 24$

So 8 groups of 3 is 24 total. I just wrote the inverse, or opposite, equation. I didn't need to draw a model to get the inverse equation, I used the information I already had from my division equation. I just rearranged it to make the opposite. The information stayed the same, I just changed the order to make the inverse.

Let's Think (Slide 6): This time I'm beginning with a multiplication equation. I need to solve this first before I can find the inverse equation. I'm going to solve this using repeated addition.



I have 4 groups of 6, so I'm going to add 6 and 6 and 6 and 6. I know I can use the plus sign to show "and." My repeated addition equation is 6 + 6 + 6 + 6. Now I'm going to add using my doubles facts. I know 6 + 6 = 12. That leaves me with 2 twelves. I don't know the doubles fact 12+12 so I'm going to stack and add. 12 + 12 is 24 total. Now I can finish my equation. 4 x 6 = 24.

$24 \div \underline{\quad} = \underline{\quad}$

Now I'm ready to write my inverse equation. What kind of equation will be the inverse of our multiplication equation? Division! Right, our equation will be division. I know division equations always go a certain way. I'm going to set it up so we can fill in the blanks. Do you know what always comes first in division? The total. Correct! What is the total from our multiplication equation? 24 is the total. Yes, 24 is the total, I'm going to fill in our first blank with 24.

$\underline{24} \div \underline{4} = \underline{6}$

What comes next? Divided by 4/6. Correct, we divided our 24 into 4 groups. Finally, what's our answer? 6 in each group. Correct!

Question…**would it still be correct if we said the inverse was 24÷ 6 = 4 instead of 24 ÷ 4 = 6? Why or why not?** Possible Student Answers, Key Points:

- It would still be correct!
- It's still a related fact because it uses the same total, groups and amount in each group.
- It's the same information but switched around.

Let's Try It (Slide 7): Let's try some together. Remember, related multiplication and division equations use the same total, number of groups and number in each group. They just solve for different information.

WARM WELCOME

Today we will explore how multiplication and division are connected.

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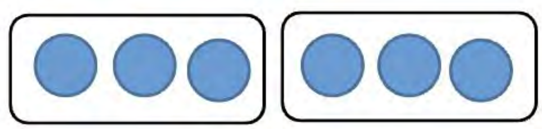
Let’s Talk:

How are multiplication and division related?

Let’s Think:



Let’s write an equation to match this model.

Multiplication	Division

How are the equations similar?

How are the equations different?

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Let's Think:

Solve. Write the inverse equation.

$24 \div 3 =$ _______

Let's Think:

Solve. Write the inverse equation.

$4 \times 6 =$ _______

Let's Try It:

Name: ___________________ G3 Lesson 1-12 Let's Try It

Directions: Write both equations that represent the model below.

1.  ___ x ___ = ___ ___ ÷ ___ = ___

2.  ___ x ___ = ___ ___ ÷ ___ = ___

3.  ___ x ___ = ___ ___ ÷ ___ = ___

Directions: Solve and write the division fact for each multiplication fact.

4. 2 x 9 = _______ and ___ ÷ ___ = ___

5. 3 x 7 = _______ and ___ ÷ ___ = ___

6. 4 x 6 = _______ and ___ ÷ ___ = ___

Directions: Solve and write the multiplication fact for each division fact.

7. 16 ÷ 8 = _______ and ___ x ___ = ___

8. 27 ÷ 3 = _______ and ___ x ___ = ___

9. 32 ÷ 4 = _______ and ___ x ___ = ___

Bonus: How are multiplication and division related?

____

____

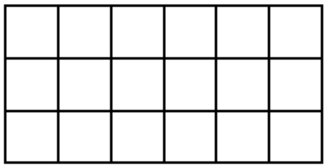
On your Own:

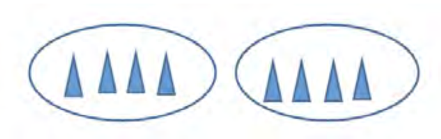
Name: ___________________ G3 Lesson 1-12 Independent Work

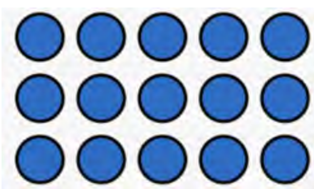
Remember: Use what you know about how multiplication and division are related.

1. Write a multiplication and division equation to match the picture below.  ___ x ___ = ___ ___ ÷ ___ = ___	2. Solve and write a division equation for the multiplication equation below. **6 x 4 =** ____ ___ ÷ ___ = ___
3. Solve and write a multiplication fact for the division equation below. **20 ÷ 5 =** ____ ___ x ___ = ___	4. Write a multiplication and division equation to match the picture below.  ___ x ___ = ___ ___ ÷ ___ = ___

Directions: Write both equations that represent the model below.

1.  _____ x _____ = _____ _____ ÷ _____ = _____

2.  _____ x _____ = _____ _____ ÷ _____ = _____

3.  _____ x _____ = _____ _____ ÷ _____ = _____

Directions: Solve and write the division fact for each multiplication fact.

4. 2 x 9 = __________ and _____ ÷ _____ = _____

5. 3 x 7 = __________ and _____ ÷ _____ = _____

6. 4 x 6 = __________ and ______ ÷ ______ = ______

Directions: Solve and write the multiplication fact for each division fact.

7. 16 ÷ 8 = __________ and ______ x ______ = ______

8. 27 ÷ 3 = __________ and ______ x ______ = ______

9. 32 ÷ 4 = __________ and ______ x ______ = ______

Bonus: How are multiplication and division related?

____

____

Name: ______________________________ G3 U1 Lesson 12 - Independent Work

Remember: Use what you know about how multiplication and division are related.

1. Write a multiplication and division equation to match the picture below.

______ x ______ = ______

______ ÷ ______ = ______

2. Solve and write a division equation for the multiplication equation below.

6 x 4 = ______

______ ÷ ______ = ______

3. Solve and write a multiplication fact for the division equation below.

20 ÷ 5 = _____

______ x ______ = ______

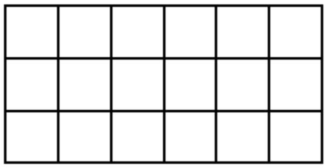
4. Write a multiplication and division equation to match the picture below.

______ x ______ = ______

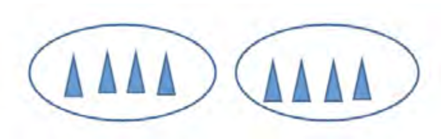
______ ÷ ______ = ______

Name: ____________________ G3 Lesson 1-12 Let's Try It

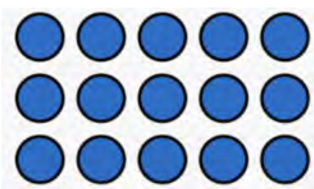
Directions: Write both equations that represent the model below.

1. 

3 x 6 = 18 18 ÷ 3 = 6

2. 

2 x 4 = 8 8 ÷ 2 = 4

3. 

3 x 5 = 15 15 ÷ 3 = 5

Directions: Solve and write the division fact for each multiplication fact.

4. 2 x 9 = 18 and 18 ÷ 2 = 9

5. 3 x 7 = 21 and 21 ÷ 3 = 7

7 + 7 + 7

14

$$\begin{array}{r} \overset{1}{1}4 \\ +\ 7 \\ \hline 21 \end{array}$$

6. 4 x 6 = 24 and 24 ÷ 6 = 4

6 + 6 + 6 + 6

12 12

12
+ 12
24

Directions: Solve and write the multiplication fact for each division fact.

7. 16 ÷ 8 = 2 and 8 x 2 = 16

8. 27 ÷ 3 = 9 and 9 x 3 = 27

9. 32 ÷ 4 = 8 and 8 x 4 = 32

32 − 4 = 28, 28 − 4 = 24

24 − 4 = 20, 20 − 4 = 16

16 − 4 = 12, 12 − 4 = 8

8 − 4 = 4, 4 − 4 = 0

Bonus: How are multiplication and division related?

Multiplication and division are opposites.

Name: ______________________

G3 Lesson 1-12 Independent Work

Remember: Use what you know about how multiplication and division are related.

1. Write a multiplication and division equation to match the picture below.

3 x 5 = 15

15 ÷ 3 = 5

2. Solve and write a division equation for the multiplication equation below.

6 x 4 = 24

4 + 4 + 4 + 4 + 4 + 4

8 8 8

16

16
+ 8
24

24 ÷ 4 = 6

3. Solve and write a multiplication fact for the division equation below.

20 ÷ 5 = 4

20
- 5
15
- 5
10
- 5
5
- 5
0

4 x 5 = 20

4. Write a multiplication and division equation to match the picture below.

2 x 3 = 6

6 ÷ 2 = 3

G3 U1 Lesson 13

Explore multiplication and division facts

G3 U1 Lesson 13 - Students will explore multiplication and division facts

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): Today we will continue exploring related multiplication and division facts. Yesterday we wrote one related division or multiplication fact. But, guess what? We can write 2 related multiplication and division facts to create a fact family.

Let's Talk (Slide 3): You already know so much about fact families using addition and subtraction. **Can you give me an example of a fact family using addition and subtraction?** You showed that fact families have four facts. They have 2 addition facts and 2 subtraction facts and all four number sentences use the same three numbers, the same two parts and the same whole. Let's see how multiplication and division fact families go.

Let's Think (Slide 4): Yesterday we wrote 1 equation each to describe a model. Today let's try writing two multiplication and two division equations to describe the array above. Let's begin with multiplication.

$2 \times 6 = 12$

$6 \times 2 = 12$

We know that arrays have equal groups that go across AND equal groups that go up and down. So, let's start by looking at the rows. We see two rows that have 6 in each row. So, 2 times 6 is 12.

But, we can also look at the columns, which go up and down! We see 6 columns with 2 in each group. So, 6 times 2 is 12.

What did you notice stayed the same in the equations? What did you notice changed? Possible Student Answers/Key Points:

- The total stayed the same. It was 12. It also stayed in the same place.
- The groups and in each group numbers stayed the same, but they switched places.

That's right. The numbers that switched are called the factors in multiplication. We can switch the factors and the product, or total, stays the same. That works for every multiplication equation. You can always write two multiplication equations by switching the factors and it does not change the total.

$12 \div 2 = 6$

$12 \div 6 = 2$

Now let's look at the division equations. When we write division equations, we always start with the whole. We see 12 in all. So we start with 12 and then if we look at the rows, we are splitting 12 into 2 groups with 6 in each group. So, 12 divided by 2 is 6.

Now instead of looking at rows, let's look at columns. We're still starting with all 12. And we're splitting 12 into 6 groups (*point to columns*), and there are 2 in each column. So 12 divided by 6 is 2. Now we have two division equations to describe the model.

So, **what changed in the division equations and what stayed the same?** Possible Student Answers/Key Points:

- All the numbers stayed the same. There was still a 2, 6 and 12.
- The total stayed in the same place, it's always before the division symbol because that's what we start with.
- The groups and amount in each group switched.

You are correct. When you described what stayed the same in both the multiplication and division, you said the total stayed the same. Multiplication always ends with the total and division always begins with the total.

But you said you can switch the number of groups and number in each group. Let's remember this in order to write fact families.

Let's Think (Slide 5): We need to write three more equations to finish the fact family. We have a division equation. Let's remember what I learned about division.

$24 \div 3 = 8$	$24 \div 8 = 3$

So, 24 is the total and in this first equation it's broken into 3 groups with 8 in each group, but I could have 24 broken into 8 groups with 3 in each group. So another equation would be 24 ÷8 = 3 to show 24 broken into 8 groups is 3 in each group.

I only switched the groups and amount in each group. Now I can write my multiplication equations.

$24 \div 3 = 8$	$24 \div 8 = 3$
$3 \times 8 = 24$	

I know I need to multiply the groups by the amount in each group to get the total. There are 3 groups with 8 in each group, that equals 24 total. The equation that shows that is 3 x 8 = 24.

$24 \div 3 = 8$	$24 \div 8 = 3$
$3 \times 8 = 24$	$8 \times 3 = 24$

We know we can switch the groups and amount in each group. Instead, there can be 8 groups with 3 in each group. The equation to show that would be 8 x 3 = 24. Again I only switched the groups and amount in each group, not the total.

Look at what we just did! We wrote four different equations that use the same three numbers! We used multiplication to show that we can switch the factors, 8 and 3 and the total stays the same. And we used division to show that we can switch the divisors and the dividend, or total, stayed the same!

Let's Try It (Slide 6-7): Let's try some together. Remember whether it's division or multiplication, we don't move the total. However, we can always switch the number of groups and amount in each group.

WARM WELCOME

Today we will explore multiplication and division facts.

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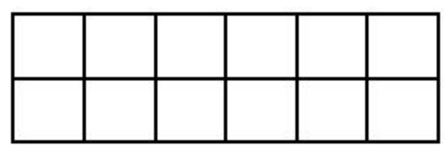
Let's Talk:

Give an example of a fact family.

Let's Think:



Multiplication

Division

What numbers can you switch in multiplication? Why?

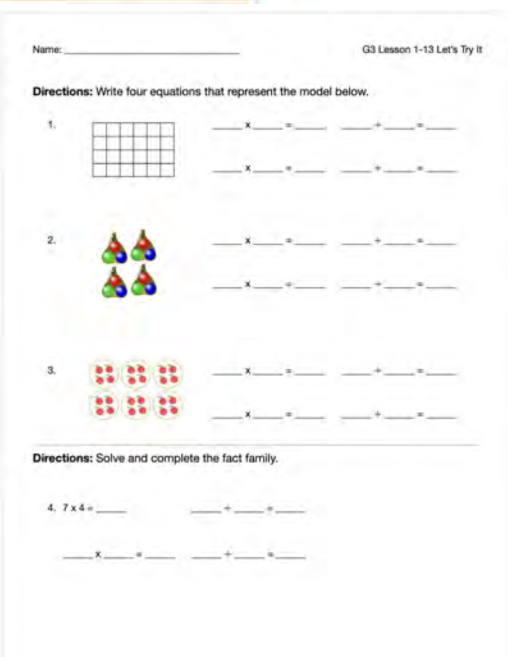
What numbers can you switch in division? Why?

Let's Think:

Write all four equations of the fact family

24 ÷ 3 = 8	

Let's Try It:



Name: ____________________ G3 Lesson 1-13 Let's Try It

Directions: Write four equations that represent the model below.

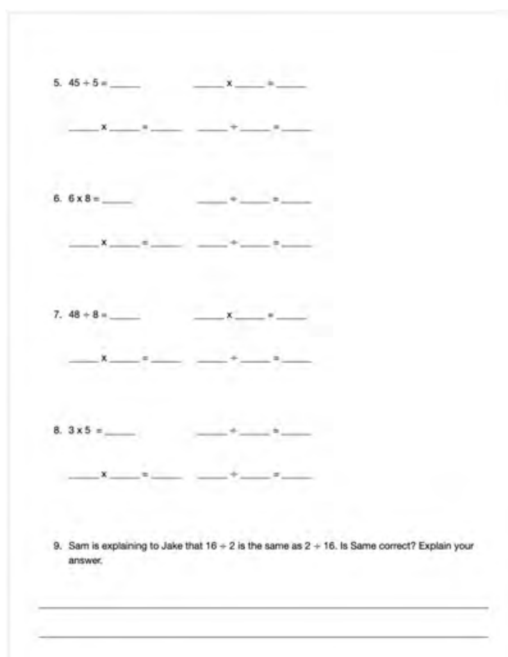
1. ___ x ___ = ___ ___ ÷ ___ = ___
   ___ x ___ = ___ ___ ÷ ___ = ___

2. ___ x ___ = ___ ___ ÷ ___ = ___
   ___ x ___ = ___ ___ ÷ ___ = ___

3. ___ x ___ = ___ ___ ÷ ___ = ___
   ___ x ___ = ___ ___ ÷ ___ = ___

Directions: Solve and complete the fact family.

4. 7 x 4 = ___ ___ ÷ ___ = ___
   ___ x ___ = ___ ___ ÷ ___ = ___



5. 45 ÷ 5 = ___ ___ x ___ = ___
   ___ x ___ = ___ ___ ÷ ___ = ___

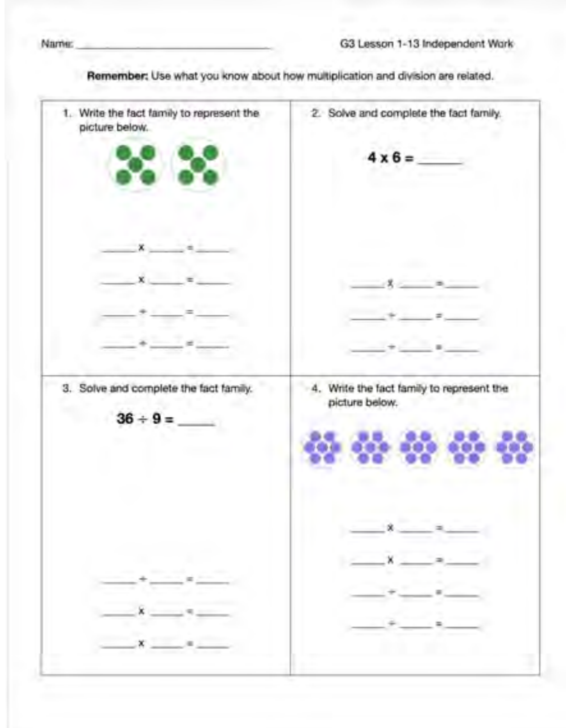
6. 6 x 8 = ___ ___ ÷ ___ = ___
   ___ x ___ = ___ ___ ÷ ___ = ___

7. 48 ÷ 8 = ___ ___ x ___ = ___
   ___ x ___ = ___ ___ ÷ ___ = ___

8. 3 x 5 = ___ ___ ÷ ___ = ___
   ___ x ___ = ___ ___ ÷ ___ = ___

9. Sam is explaining to Jake that 16 ÷ 2 is the same as 2 ÷ 16. Is Same correct? Explain your answer.

On your Own:



Name: ______________________________ G3 Lesson 1-13 Independent Work

Remember: Use what you know about how multiplication and division are related.

1. Write the fact family to represent the picture below.

____ x ____ = ____

____ x ____ = ____

____ ÷ ____ = ____

____ ÷ ____ = ____

2. Solve and complete the fact family.

4 x 6 = ____

____ x ____ = ____

____ ÷ ____ = ____

____ ÷ ____ = ____

3. Solve and complete the fact family.

36 ÷ 9 = ____

____ ÷ ____ = ____

____ x ____ = ____

____ x ____ = ____

4. Write the fact family to represent the picture below.

____ x ____ = ____

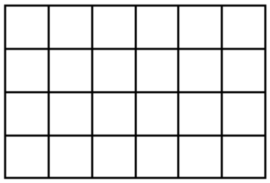
____ x ____ = ____

____ ÷ ____ = ____

____ ÷ ____ = ____

Name: ______________________________ G3 U1 Lesson 13 - Let’s Try It

Directions: Write four equations that represent the model below.

1. 

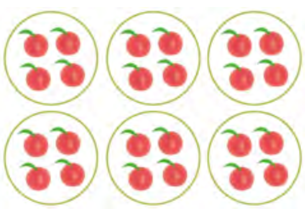
______ x ______ = ______ ______ ÷ ______ = ______

______ x ______ = ______ ______ ÷ ______ = ______

2. 

______ x ______ = ______ ______ ÷ ______ = ______

______ x ______ = ______ ______ ÷ ______ = ______

3. 

______ x ______ = ______ ______ ÷ ______ = ______

______ x ______ = ______ ______ ÷ ______ = ______

Directions: Solve and complete the fact family.

4. 7 x 4 = ______ ______ ÷ ______ = ______

______ x ______ = ______ ______ ÷ ______ = ______

5. $45 \div 5 =$ ______ ______ x ______ = ______

______ x ______ = ______ ______ ÷ ______ = ______

6. $48 \div 8 =$ ______ ______ x ______ = ______

______ x ______ = ______ ______ ÷ ______ = ______

7. $3 \times 5 =$ ______ ______ ÷ ______ = ______

______ x ______ = ______ ______ ÷ ______ = ______

8. Sam is explaining to Jake that $16 \div 2$ is the same as $2 \div 16$. Is Same correct? Explain your answer.

Name: ______________________________ G3 U1 Lesson 13 - Independent Work

Remember: Use what you know about how multiplication and division are related.

1. Write the fact family to represent the picture below.

______ x ______ = ______

______ x ______ = ______

______ ÷ ______ = ______

______ ÷ ______ = ______

2. Solve and complete the fact family.

4 x 6 = ______

______ x ______ = ______

______ ÷ ______ = ______

______ ÷ ______ = ______

3. Solve and complete the fact family.

36 ÷ 9 = _____

______ ÷ ______ = ______

______ x ______ = ______

______ x ______ = ______

4. Write the fact family to represent the picture below.

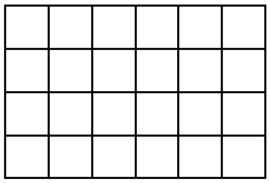
______ x ______ = ______

______ x ______ = ______

______ ÷ ______ = ______

______ ÷ ______ = ______

Directions: Write four equations that represent the model below.

1. 

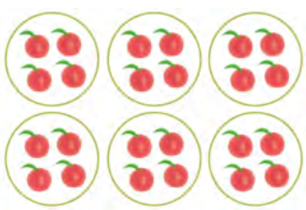
4 x 6 = 24 24 ÷ 4 = 6

6 x 4 = 24 24 ÷ 6 = 4

2. 

4 x 3 = 12 12 ÷ 3 = 4

3 x 4 = 12 12 ÷ 4 = 3

3. 

6 x 4 = 24 24 ÷ 4 = 6

4 x 6 = 24 24 ÷ 6 = 4

Directions: Solve and complete the fact family.

4. 7 x 4 = 28 28 ÷ 4 = 7

4 x 7 = 28 28 ÷ 7 = 4

5. 45 ÷ 5 = 9

5 x 9 = 45

9 x 5 = 45

45 ÷ 9 = 5

45 − 5 = 40; 40 − 5 = 35; 35 − 5 = 30

30 − 5 = 25; 25 − 5 = 20; 20 − 5 = 15

15 − 5 = 10; 10 − 5 = 5; 5 − 5 = 0

6. 48 ÷ 8 = 6

6 x 8 = 48

8 x 6 = 48

48 ÷ 6 = 8

48 − 8 = 40; 40 − 8 = 32

32 − 8 = 24; 24 − 8 = 16

16 − 8 = 8; 8 − 8 = 0

7. 3 x 5 = 15

15 ÷ 3 = 5

5 x 3 = 15

15 ÷ 5 = 3

5 + 5 + 5

10

$$\begin{array}{r} 10 \\ +\ 5 \\ \hline 15 \end{array}$$

8. Sam is explaining to Jake that 16 ÷ 2 is the same as 2 ÷ 16. Is Same correct? Explain your answer.

No he is not correct. Division must start with the total. You can't move the total.

Name: ______________________________ G3 Lesson 1-13 Independent Work

Remember: Use what you know about how multiplication and division are related.

1. Write the fact family to represent the picture below.

2 x 5 = 10
5 x 2 = 10
10 ÷ 2 = 5
10 ÷ 5 = 2

2. Solve and complete the fact family.

4 x 6 = 24

6 + 6 + 6 + 6
12 12

12
+12
24

6 x 4 = 24
24 ÷ 6 = 4
24 ÷ 4 = 6

3. Solve and complete the fact family.

36 ÷ 9 = 4

36
− 9
27
− 9
18

18
− 9
9
− 9
0

36 ÷ 4 = 9
4 x 9 = 36
9 x 4 = 36

4. Write the fact family to represent the picture below.

5 x 7 = 35
7 x 5 = 35
35 ÷ 3 = 7
35 ÷ 7 = 3

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G3 Unit 2:

Using Place Value to Add, Subtract, and Round

G3 U2 Lesson 1

Use place value to model three-digit numbers (word form, place value form, expanded form)

CITYTUTOR DC

G3 U2 Lesson 1 - Students will use place value to model three-digit numbers (word form, place value form, expanded form)

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): Today we will use what we know about place and value to model three digit numbers in word form, place value form and expanded form. You learned a lot about three-digit numbers in 2nd grade and the place and value of the digits.

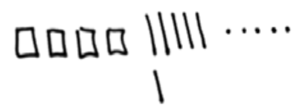
Let's Review (Slide 3): For example in the number 728 there are seven hundreds, two tens, and eight ones. I know because the location of the digit tells me the value. Then I also know that the value of the 2 in 728 is 20. Because the two is in the tens place there are two tens or 20.

Let's Talk (Slide 4): So before we begin to model three-digit numbers in different forms, I want to have a discussion. **What are some ways that 357 and 375 are the same and different?**

Possible Student Answers, Key points

- In the number 357 there are 3 hundreds, 5 tens and 7 ones. In the number 375 there are the same number of hundreds.
- Both numbers have the same digits but they are in different places.
- Because the digits are in different places, the value of the numbers is different.

Let's Think (Slide 5): Those are great ideas. Now that we have fired up our brains to think about three-digit numbers, let's think about the different ways we could model three-digit numbers. Let's look at the number 465.

Standard Form:	Place Value Form:
H T O 4 6 5	
Expanded Form:	**Written Form:**
400 + 60 + 5 = 465	four hundred Sixty five

I want to begin by making sure I understand the place of each digit. I can do this by labeling the place of each digit. Next I can <u>model</u> the number with ones, tens and hundreds, in other words I can represent the place and value of each digit. I will draw 4 hundred flats to represent 4 hundred, then I can draw 6 tens sticks to represent 6 tens. Finally I can draw 5 ones or five. That is one way to model a three-digit number.

Another way to represent a three-digit number is through <u>expanded form</u>. Expanded form is a when we add the value of each digit. Let's look at the number 465 again. We just modeled the number. We thought about the value of each place. How many hundreds did we draw? 4 hundreds or 400 in all. How many tens did we draw? 6 tens or 60 in all. How many ones did we draw? 5 ones or simply 5 .Now I can add the value of each place together to represent the whole number. 400 + 60 + 5 = 465. I could also write 5 + 400 + 60 = 465.

Finally we can represent three-digit numbers in <u>written form</u>. We can write out the words that spell each number. When we do this we want to make sure we write the numbers we say them. Let's look at 465 one more time. When I say the number 465, four hundred sixty five, I notice that I say how many hundreds and then the number 65.

Let's Try it (Slides 6-7): Now let's try this together. We will practice modeling numbers with models in place value form, in expanded form and in written form together, step by step.

WARM WELCOME

(Tutors should adjust this slide for individual opening routine)

Today we will use place value to model three-digit numbers (word form, place value form, expanded form)

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Let's Review:

Place and Value

637

Hundreds	Tens	Ones
7	2	8

Let's Talk:

What are some ways that 357 and 375 are the same and different?

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Let's Think:

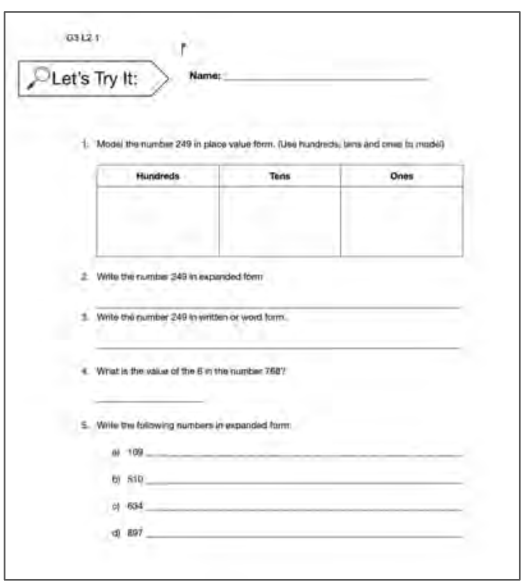
Let's represent this number several ways.

465

Standard Form:	**Place Value Form:**
Expanded Form:	**Written Form:**

Let's Try It:

Let's practice modeling three-digit numbers, together!



G3 L2.1

Let's Try It: Name: ______________________

1. Model the number 249 in place value form. (Use hundreds, tens and ones to model)

Hundreds	Tens	Ones

2. Write the number 249 in expanded form

____

3. Write the number 249 in written or word form.

____

4. What is the value of the 6 in the number 768?

____

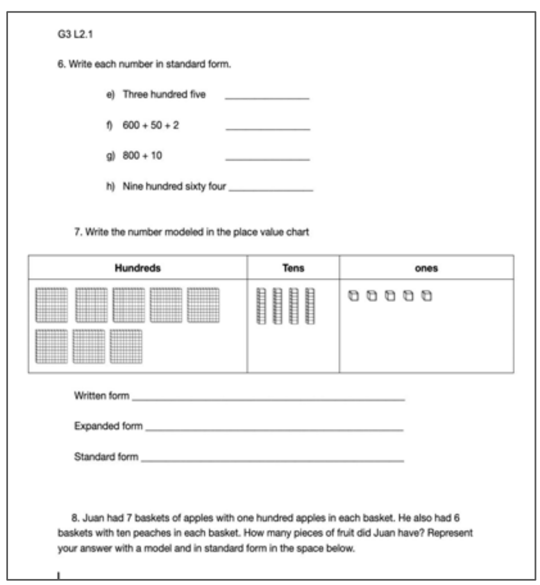
5. Write the following numbers in expanded form

a) 109 ______________________

b) 510 ______________________

c) 634 ______________________

d) 897 ______________________



G3 L2.1

6. Write each number in standard form.

e) Three hundred five __________

f) 600 + 50 + 2 __________

g) 800 + 10 __________

h) Nine hundred sixty four __________

7. Write the number modeled in the place value chart

Hundreds	Tens	ones

Written form ______________________

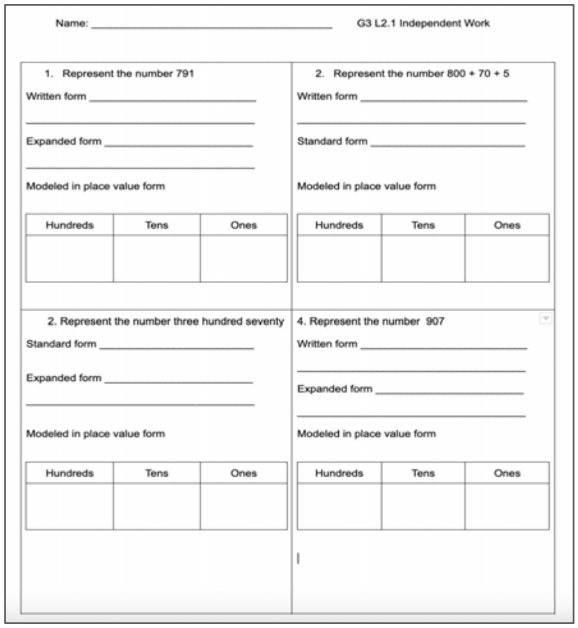
Expanded form ______________________

Standard form ______________________

8. Juan had 7 baskets of apples with one hundred apples in each basket. He also had 6 baskets with ten peaches in each basket. How many pieces of fruit did Juan have? Represent your answer with a model and in standard form in the space below.

On your Own:

Now it’s time to practice modeling three-digit numbers on your own!



Name: ______________________________ G3 L2.1 Independent Work

1. Represent the number 791

Written form ______________________

____

Expanded form ______________________

____

Modeled in place value form

Hundreds	Tens	Ones

2. Represent the number 800 + 70 + 5

Written form ______________________

____

Standard form ______________________

Modeled in place value form

Hundreds	Tens	Ones

2. Represent the number three hundred seventy

Standard form ______________________

Expanded form ______________________

____

Modeled in place value form

Hundreds	Tens	Ones

4. Represent the number 907

Written form ______________________

____

Expanded form ______________________

____

Modeled in place value form

Hundreds	Tens	Ones

Name: ____

1. Model the number 249 in place value form. (Use hundreds, tens and ones to model)

Hundreds	**Tens**	**Ones**

2. Write the number 249 in expanded form

____

3. Write the number 249 in written or word form.

____

4. What is the value of the 6 in the number 768?

____

5. Write the following numbers in expanded form:

a) 109 ____

b) 510 ____

c) 634 ____

d) 897 ____

6. Write each number in standard form.

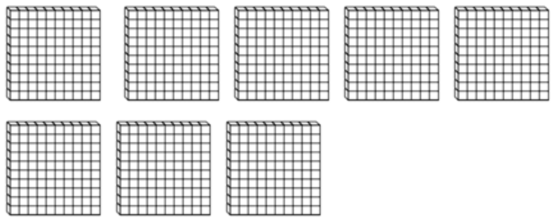
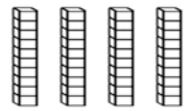
e) Three hundred five ______________

f) 600 + 50 + 2 ______________

g) 800 + 10 ______________

h) Nine hundred sixty four ______________

7. Write the number modeled in the place value chart

Hundreds	Tens	ones
		

Written form ____

Expanded form ____

Standard form ____

8. Juan had 7 baskets of apples with one hundred apples in each basket. He also had 6 baskets with ten peaches in each basket. How many pieces of fruit did Juan have? Represent your answer with a model and in standard form in the space below.

Name: ____

1. Represent the number **791**

Written form: ______________________________

____

Expanded form: ______________________________

____

Modeled in place value form:

Hundreds	Tens	Ones

2. Represent the number **800 + 70 + 5**

Written form: ______________________________

____

Standard form: ______________________________

Modeled in place value form:

Hundreds	Tens	Ones

3. Represent the number **three hundred seventy**

Standard form: ______________________________

Expanded form: ______________________________

____

Modeled in place value form:

Hundreds	Tens	Ones

4. Represent the number **907**

Written form: ______________________________

____

Expanded form: ______________________________

____

Modeled in place value form:

Hundreds	Tens	Ones

Name: Answer Key G3 U2 Lesson 1 - Let's Try It

1. Model the number 249 in place value form. (Use hundreds, tens and ones to model)

Hundreds	Tens	Ones
□ □	| | | |	• • • • • • • • •

2. Write the number 249 in expanded form

200 + 40 + 9 = 249

3. Write the number 249 in written or word form.

Two hundred forty nine

4. What is the value of the 6 in the number 768?

60

5. Write the following numbers in expanded form:

a) 109 100 + 9 = 109

b) 510 500 + 10 = 510

c) 634 600 + 30 + 4 = 634

d) 897 800 + 90 + 7

6. Write each number in standard form.

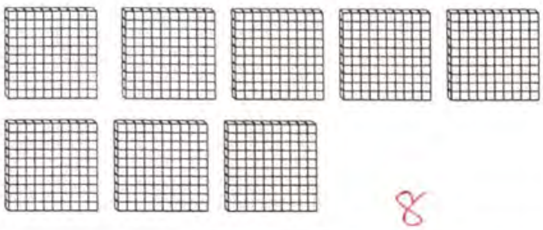
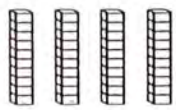
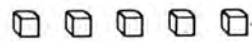
e) Three hundred five 305

f) 600 + 50 + 2 ___652___

g) 800 + 10 ___810___

h) Nine hundred sixty four ___964___

7. Write the number modeled in the place value chart

Hundreds	Tens	ones
 8	 4	 5

Written form ___Eight hundred forty five___

Expanded form ___800 + 40 + 5___

Standard form ___845___

8. Juan had 7 baskets of apples with one hundred apples in each basket. He also had 6 baskets with ten peaches in each basket. How many pieces of fruit did Juan have? Represent your answer with a model and in standard form in the space below.

7 hundred apples

6 tens peaches

$700 + 60 = 760$

Juan had 760 pieces of fruit.

Name: Answer Key G3 U2 Lesson 1 - On Your Own

1. Represent the number 791

Written form Seven hundred ninety one

Expanded form 700 + 90 + 1 = 791

Modeled in place value form

Hundreds	Tens	Ones

2. Represent the number 800 + 70 + 5

Written form Eight Seventy Five

Standard form 875

Modeled in place value form

Hundreds	Tens	Ones

2. Represent the number three hundred seventy

Standard form 370

Expanded form 300 + 70 = 370

Modeled in place value form

Hundreds	Tens	Ones

4. Represent the number 907

Written form nine hundred Seven

Expanded form 900 + 7 = 907

Modeled in place value form

Hundreds	Tens	Ones

G3 U2 Lesson 2

Students will use place value to compare three-digit numbers

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G3 U2 Lesson 2 - Students will use place value to compare three-digit numbers

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 3): Today we will use what we know about place value to help us compare three-digit numbers. What do you think about when I say compare? Possible Student Answers, Key Points:

- Compare means to see how things are similar and different
- Compare means to find whether something is more or less

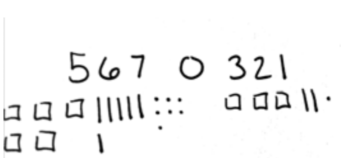
Those are great ideas. In life, we compare a lot of things like who is taller or shorter than someone else, we also compare amounts like who has more M&Ms than the other person. In math, we will often compare number amounts. We will use what we know about the place and the value of digits to help us determine if numbers are greater, less than or equal to another number.

Let's Talk (Slide 4): Before we explore today's lesson, let's look at the digits 6, 7 and 8. What is the largest number we could make with these digits? What is the smallest number we could make with these digits? Possible Student Answers, Key Points:

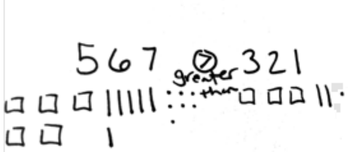
- 876
- 8 is the largest number so it should go in the greatest place. Then 7 is the next largest number, it should go in the next largest place.

Let's Talk (Slide 5): Exactly. Now how would this number change if we switched the order of the digits to 678? Let's compare 876 to 678. Now the smallest digit is in the largest place. So this number is much smaller than 876! The 8 in the hundreds place made the number much larger because there were more hundreds. When we switched the digits and put the smallest digit in the hundreds place, the number was smaller or less than the first number. Nice job! Today, we will continue to use the place and value of the digits to help us compare three-digit numbers.

Let's Think (Slide 6): When we are asked to compare three-digit numbers, we are being asked if a number is greater, less than or equal in amount to another number. Let me show you what I mean. Let's look at this question: (*read the symbols with the meaning of each symbol*) "Use the symbols <, > or = to fill in the blank below; 567___321" Let's think… when we compare two numbers, we are trying to find if the first number is greater, less than or equal to the other number.



I can use what I know about place value to help me compare. I need to begin in the greatest place. The hundreds place is the largest place. In the first number I see a 5 in the hundreds place. This number has 5 hundreds (*draw 5 hundreds*). There are also 6 tens (*draw 6 tens*) and 7 ones (*draw 7 ones*). In the next number there is a 3 in the hundreds place. This number has 3 hundreds. There are also 2 tens and 1 one.



When we compare, we look at the greatest place first. I see that I am comparing a three-digit number to another three-digit number, so I am going to look in the hundreds place first. 567 has 5 hundreds and 321 only has 3 hundreds. So, I know that 5 hundreds is greater than 3 hundreds. So 567 is greater than 321.

To complete the number sentence I will need to read from left to right, the same way we always read and write. I will need to use the greater than sign. The greater than sign opens towards the greater number.

Let's Think (Slide 7): Let's try another one. We want to compare 432 to 438. We talked about comparing numbers by starting with the greatest place to find out if 432 is greater, less than or equal to 438. In the last question, we drew out the model for each number to see the amount visually. Now, I want to show you another strategy that you can use to help you compare numbers. Let's try comparing by stacking the numbers to help us compare the value of each place.

H	T	O
4	3	2
4	3	8

I am going to write the first number, 432 and label each place. It's a three-digit number so I am going to label H for hundreds, T for tens, and O for ones. Now, I am comparing 432 to 438. I see that 438 is also a three-digit number so I am going to write the 4 in the hundreds place, the 3 in the tens, and the 8 in the ones. This is similar to the way that we stack out numbers when we're getting ready to add or subtract.

So I see there are 4 hundreds in 432 and 4 hundreds in 438. They have the same number of hundreds so I need to check the next greatest place to be sure, I'll go right next door to the tens place. Both numbers have 3 tens. I still have one more place to check. There are 2 ones in 432 and 8 ones in 438. So, 438 has more ones, or 432 has less ones.

H	T	O
4	3	2
4	3	8

$432 \underset{\text{less than}}{<} 438$

Because both numbers have the same amount in the hundreds and tens place but 438 has more ones, 438 is the greater number. But, we know that when we're comparing we have to read from left to right to complete the number sentence. Let's try it, "432 is _____ than 438". We found out that 438 is the greater number because it has more ones. But we want to compare 432 to 438. So, 432 is less than 438. That sounds better. Because I know that 438 is greater that means 432 is smaller or less than 438.

Let's Try it (Slides 8): Let's practice comparing three-digit numbers together. Remember, when we compare numbers, we think about the place and the value of each digit. We begin in the greatest place value until we know if the numbers are greater, less than or the same as the other.

WARM WELCOME

(Tutors should adjust this slide for individual opening routine)

Students will use place value to compare three-digit numbers

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Let's Review:

What does it mean to compare?

Let's Talk:

What is the largest number we could make using the digits 6, 7 and 8 ?

Let's Talk:

Now, switch the order of the digits to 678

Compare 876 to 678

Let's Think:

Use the symbols <, > or = to fill in the blank below.

567 ◯ 321

- ❏ Label the place and value of the digits.
- ❏ Compare starting in the greatest place
- ❏ Read from left to right to compare.
- ❏ Write the meaning of the symbol and the symbol to compare

Let's Think:

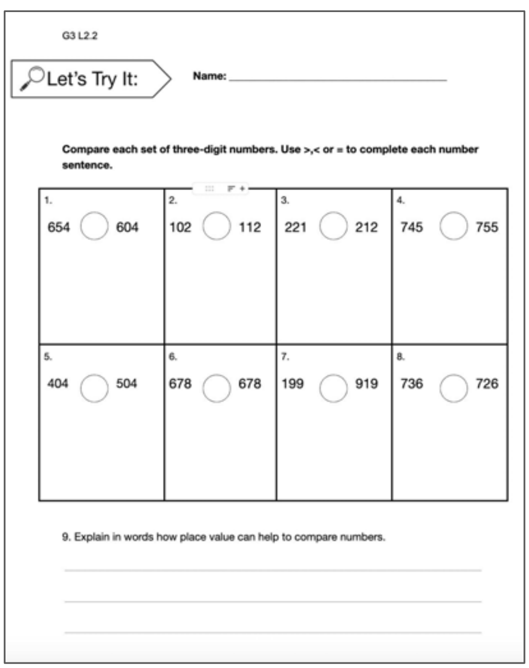
Use the symbols <, > or = to fill in the blank below.

432 ◯ 438

- ❏ Label the place and value of the digits.
- ❏ Compare starting in the greatest place
- ❏ Read from left to right to compare.
- ❏ Write the meaning of the symbol and the symbol to compare

Let's Try It:

Let's practice comparing three-digit numbers, together!



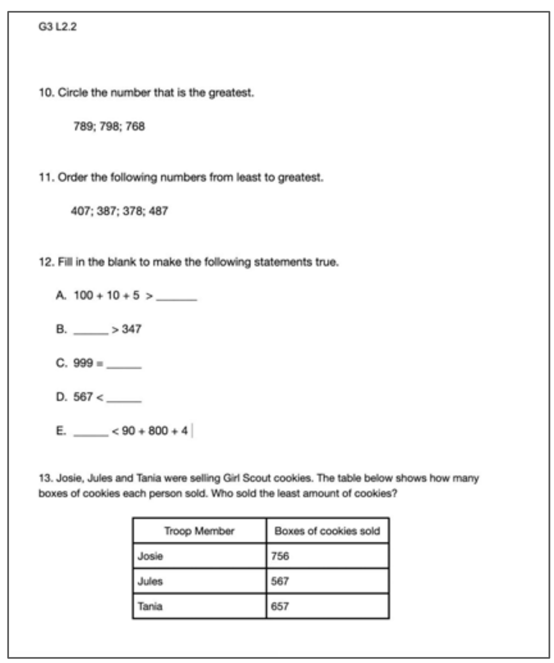
G3 L2.2

Let's Try It: Name: ____________________

Compare each set of three-digit numbers. Use >,< or = to complete each number sentence.

1. 654 ◯ 604	2. 102 ◯ 112	3. 221 ◯ 212	4. 745 ◯ 755
5. 404 ◯ 504	6. 678 ◯ 678	7. 199 ◯ 919	8. 736 ◯ 726

9. Explain in words how place value can help to compare numbers.



G3 L2.2

10. Circle the number that is the greatest.

789; 798; 768

11. Order the following numbers from least to greatest.

407; 387; 378; 487

12. Fill in the blank to make the following statements true.

A. 100 + 10 + 5 > _____

B. _____ > 347

C. 999 = _____

D. 567 < _____

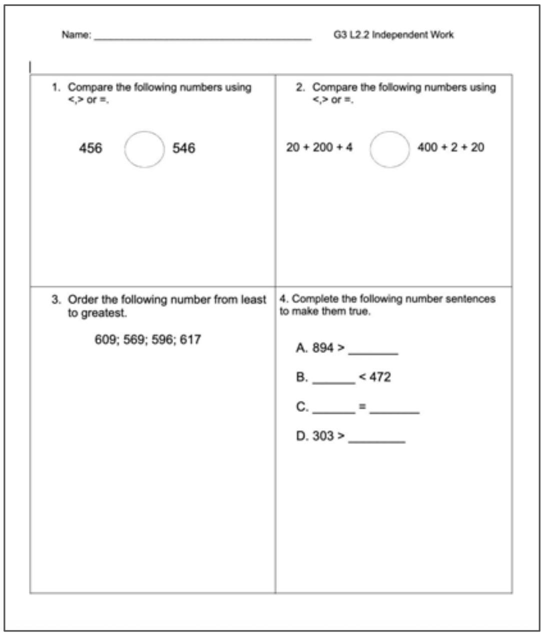
E. _____ < 90 + 800 + 4

13. Josie, Jules and Tania were selling Girl Scout cookies. The table below shows how many boxes of cookies each person sold. Who sold the least amount of cookies?

Troop Member	Boxes of cookies sold
Josie	756
Jules	567
Tania	657

On your Own:

Now it’s time to practice comparing three-digit numbers on your own!



Name: ______________________________ G3 L2.2 Independent Work

1. Compare the following numbers using <,> or =. 456 ◯ 546	2. Compare the following numbers using <,> or =. 20 + 200 + 4 ◯ 400 + 2 + 20
3. Order the following number from least to greatest. 609; 569; 596; 617	4. Complete the following number sentences to make them true. A. 894 > _______ B. ______ < 472 C. ______ = _______ D. 303 > ________

Compare each set of three-digit numbers. Use >,< or = to complete each number sentence.

1.	2.	3.	4.
654 ◯ 604	102 ◯ 112	221 ◯ 212	745 ◯ 755

5. Explain in words how place value can help to compare numbers.

____

____

6. Circle the number that is the greatest: **789, 798, 768**

7 . Order the following numbers from least to greatest: **407, 387, 378, 487**

least __________ __________ __________ __________ greatest

8. Fill in the blank to make the following statements true.

A. 100 + 10 + 5 > _______

B. ______ > 347

C. 999 = ______

D. 567 < ______

9. Josie, Jules and Tania were selling Girl Scout cookies. The table to the right shows how many boxes of cookies each person sold. Who sold the least amount of cookies?

Troop Member	Boxes of Cookies Sold
Josie	756
Jules	567
Tania	657

____

Name: ____

1. Compare the following numbers using <, > or = 456 ◯ 546	2. Compare the following numbers using <, > or = 20 + 200 + 4 ◯ 400 + 2 + 20
3. Order the following number from least to greatest. 609; 569; 596; 617	4. Complete the following number sentences to make them true. A. 894 > _______ B. ______ < 472 C. ______ = _______ D. 303 > ________

Name: ______________________________ G3 U2 Lesson 2 - Let's Try It

Compare each set of three-digit numbers. Use >,< or = to complete each number sentence.

1. $654 > 604$ greater than H T O 6 5 4 6 0 4	2. $102 < 112$ less than H T O 1 0 2 1 1 2	3. $221 > 212$ greater than H T O 2 2 1 2 1 2	4. $745 < 755$ less than H T O 7 4 5 7 5 5
5. $404 < 504$ less than H T O 4 0 4 5 0 4	6. $678 = 678$ equal to H T O 6 7 8 6 7 8	7. $199 < 919$ less than H T O 1 9 9 9 1 9	8. $736 > 726$ greater than 7 3 6 7 2 6

9. Explain in words how place value can help to compare numbers.

I can begin in the largest place. The greatest number in the largest place will have the greatest value. If they are the same, I can look at the next greatest place, until I find which number is greatest, smallest or equal to.

10. Circle the number that is the greatest.

789; 798; 768

H T O
7 8 9
7 9 8
7 6 8

11. Order the following numbers from least to greatest.

407; 387; 378; 487

378, 387, 407, 487

H T O
4 0 7
3 8 7
3 7 8
4 8 7

12. Fill in the blank to make the following statements true.

A. 100 + 10 + 5 > 105
greater than

H T O
1 1 5
1 0 5

B. 647 > 347
greater than

H T O
3 4 7
6 4 7

C. 999 = 999
equal

H T O
5 6 7
8 6 7

D. 567 < 867
less than

H T O
4 0 0
8 9 4

E. 400 < 90 + 800 + 4
less than

13. Josie, Jules and Tania were selling Girl Scout cookies. The table below shows how many boxes of cookies each person sold. Who sold the least amount of cookies?

Troop Member	Boxes of cookies sold
Josie	756
Jules	567
Tania	657

H T O
7 5 6
5 6 7
6 5 7

Jules Sold the least amount of cookies

Name: ______________________________ G3 U2 Lesson 2 - On Your Own

1. Compare the following numbers using <,> or =.

456 (<) 546

H T O
456
546

less than

2. Compare the following numbers using <,> or =.

20 + 200 + 4 (<) 400 + 2 + 20

H T O
224
422

less than

3. Order the following number from least to greatest.

609; 569; 596; 617

H T O
609
569
596
617

569, 596, 609
617

4. Complete the following number sentences to make them true.

A. 894 > 880
greater than

B. 400 < 472
less than

C. 128 = 128

D. 303 > 300
greater than

H T O
894
880

H T O
472
400

H T O
128
128

H T O
303
300

G3 U2 Lesson 3

Students will use place value to add twodigit numbers (standard algorithm with PV language)

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G3 U2 Lesson 3 - Students will use place value to add two-digit numbers

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 3): Today we will use what we know about place value to add two-digit numbers. We have been using place value to help us model and compare numbers. Today we will use place value to help us combine or add numbers.

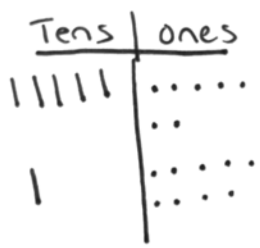
Let's Talk (Slide 3): Before we dive into today's learning. Let's think, how could place value help us to add 57 + 19 =___? Possible Student Answers, Key Points:

- We can look at the ones place to help us combine ones with ones.
- We know we have to combine tens with tens.
- When we have ten or more ones, we must regroup or carry our new ten to the tens place.

Let's Think (Slide 4): What great ideas! When we add or combine numbers, we must use place value to help us. Let's think about how we can add 57 + 19 using place value.

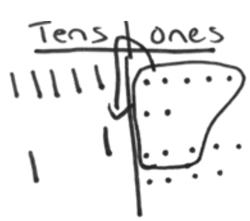
$$\begin{array}{rcc} & T & O \\ & 5 & 7 \\ + & 1 & 9 \\ \hline \end{array}$$

I want to begin by labeling the place of each digit. This will help me to make sure I am adding my ones with my ones and my tens with my tens.

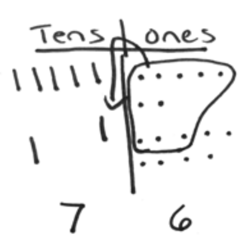


I can also model both addends to help me combine the ones with the ones and tens with the tens. So, I know that 57 has 5 tens and 7 ones so I am going to draw a place value chart with tens and ones and put 5 tens in the tens column and 7 ones in the ones column. I am adding 19 to 57. How many tens does 19 have? One! And how many ones does 19 have? 9! So, I need to add 1 tens and 9 ones to each column. Notice how I made sure to keep my ones with ones and tens with tens. This model is the exact same as the digits, there are 5 tens with 1 ten (*point to written out digits*) and 7 ones added with 9 ones (*point to digits*), this is just another way to show how we are using place value to help us add.

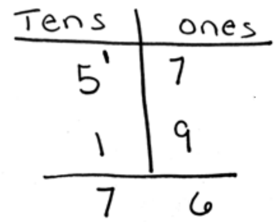
Now, when I add, I always start in the smallest place. These are two-digit numbers so I'm going to begin in my ones place. This is very important because if there are more than ten ones I MUST REGROUP!
So see what 9 ones and 7 ones make. I have 1,2,3,...16 ones.



Wow, 16 ones! That is way too many for the ones place. I know that tens must go in the tens place. Each time I have ten or more ones, I must regroup which means that I take 10 single ones and turn them into a group of ten! Count with me 1,2,3..10! I found ten ones, I must regroup! (*Circle the ten ones and regroup the ten single ones into one ten in the tens place.*)



I must keep the remaining ones in the ones place. So that is 6 ones. Finally I can add up ALL of my tens. 1,2,3,...7! We modeled how to add 57 + 19 and found the total or sum is 76. When I was adding 57 to 19, I had to regroup. When I added 7 ones with 9 ones, I got 16 ones and that is too many ones! So I had to take 10 ones and regroup them into 1 group of ten (*point to model as you're retelling*).

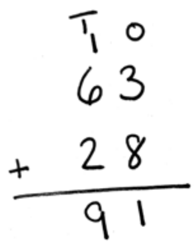


Let's see if we can use place value to add when there are only digits! Just like I did with my place value drawings, I will line up my ones with my ones and my tens with my tens.

Now, just like when we added our place value pictures, we will begin by adding in the ones place…7 + 9 is 16! I know that 16 is the same as 1 ten and 6 ones. So, just like I regrouped in my picture, I will carry the ten into the tens place. So I have 6 ones total. Now I can add up ALL of my tens. 1 + 5 is 6 and 6 + 1 more is 7.

Let's Think (Slide 5): Let's try another one. The first thing I'm going to do to make sure I am combining my ones with my ones and tens with my tens is to label ones and tens. Now I can begin adding in my one's place. Remind me, why do I want to begin adding in the ones place? Possible Student Answers, Key Points:

- If there are more than ten ones, you need to turn the ten single ones into a ten and carry the ten into the tens place.
- You always have to start adding in the smallest place!



That's right, I always start in the smallest place in case I need to regroup. So, 3 + 8 is 11. I know 11 has more than ten single ones. So I must regroup. Watch me carry the ten into the tens place. I have one single one left in my one's place. I will make sure I write that in the answer space in the one's place. Now I can add ALL of my tens. 1 + 6 is 7 and 2 more is 9. So 63 + 28 is 91.

Let's Try it (Slides 7): Let's practice using place value to help us add two-digit numbers. We're going to work on this page together step by step. As we are working we must remember to begin in the one's place and anytime we have more than ten ones… we MUST regroup!

WARM WELCOME

(Tutors should adjust this slide for individual opening routine)

Today we will use place value to add two-digit numbers.

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Let's Talk:

How could place value help us to add 57 + 19 =___?

Let's Think:

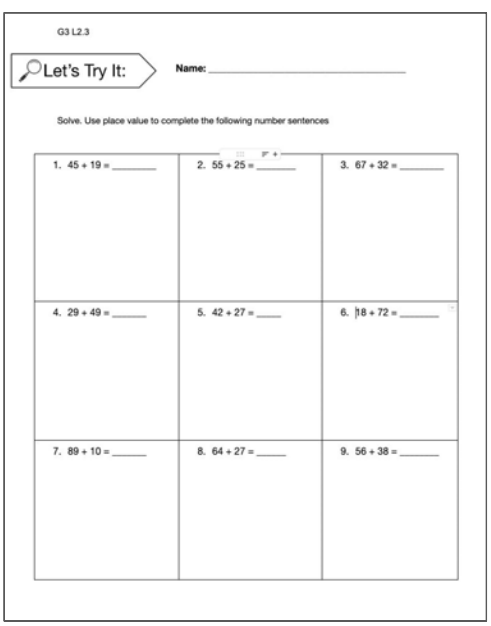
57 + 19 = ____

Let's Think:

$$63 + 28 = \_\_\_\_$$

Let's Try It:

Let's practice adding two-digit numbers, together!

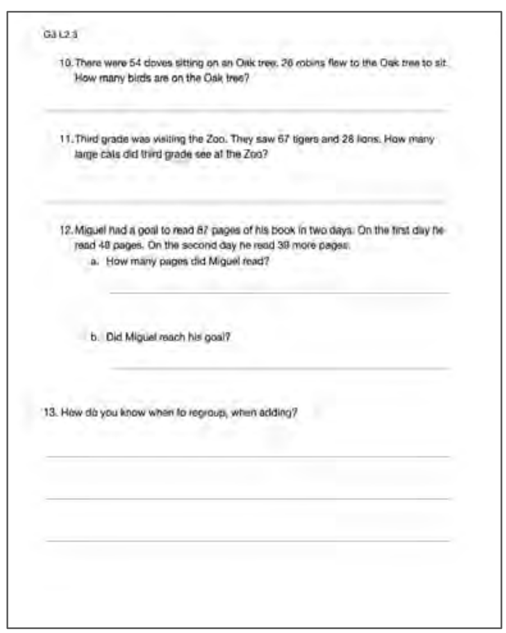


G3 L2.3

Let's Try It: **Name:** ______________________

Solve. Use place value to complete the following number sentences

1. 45 + 19 = ______	2. 55 + 25 = ______	3. 67 + 32 = ______
4. 29 + 49 = ______	5. 42 + 27 = ____	6. 18 + 72 = ______
7. 89 + 10 = ______	8. 64 + 27 = _____	9. 56 + 38 = ______



G3 L2.3

10. There were 54 doves sitting on an Oak tree. 28 robins flew to the Oak tree to sit. How many birds are on the Oak tree?

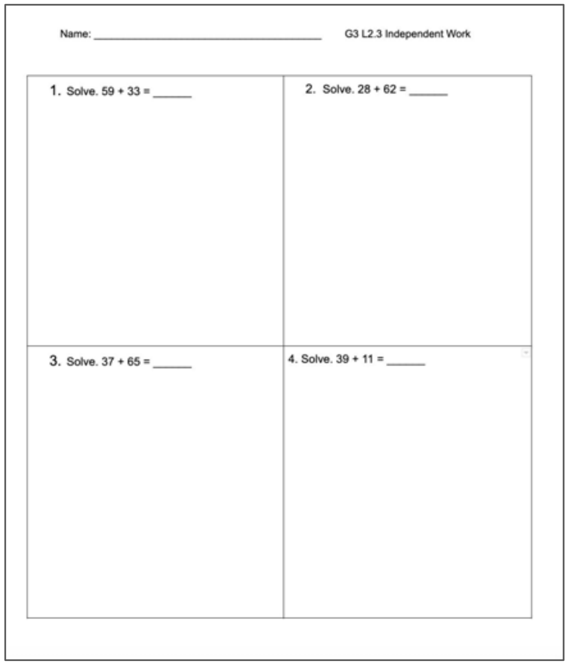
11. Third grade was visiting the Zoo. They saw 67 tigers and 28 lions. How many large cats did third grade see at the Zoo?

12. Miguel had a goal to read 87 pages of his book in two days. On the first day he read 48 pages. On the second day he read 38 more pages.
    a. How many pages did Miguel read?
    b. Did Miguel reach his goal?

13. How do you know when to regroup, when adding?

On your Own:

Now it’s time to practice adding two-digit numbers on your own!



Name: ______________________________ G3 L2.3 Independent Work

1. Solve. 59 + 33 = _____	2. Solve. 28 + 62 = _____
3. Solve. 37 + 65 = _____	4. Solve. 39 + 11 = _____

Name: ____

Solve. Use place value to complete the following number sentences

1. 45 + 19 = _________	2. 55 + 25 = ________	3. 67 + 32 = _________
4. 29 + 49 = _______	5. 42 + 27 = _____	6. 18 + 72 = ________
7. 89 + 10 = _______	8. 64 + 27 = ______	9. 56 + 38 = ________

10. There were 54 doves sitting on an Oak tree. 26 robins flew to the Oak tree to sit. How many birds are on the Oak tree?

11. Third grade was visiting the Zoo. They saw 67 tigers and 28 lions. How many large cats did third graders see at the Zoo?

12. Miguel had a goal to read 87 pages of his book in two days. On the first day he read 48 pages. On the second day he read 39 more pages.

a. How many pages did Miguel read?

b. Did Miguel reach his goal?

13. How do you know when to regroup, when adding?

1. Solve. **59 + 33 = ______**	2. Solve. **28 + 62 = ______**
3. Solve. **37 + 65 = ______**	4. Solve. **39 + 11 = ______**

Name: ______________________________

Solve. Use place value to complete the following number sentences

1. 45 + 19 = 64 T O 45 + 19 64	2. 55 + 25 = 80 T O 55 + 25 80	3. 67 + 32 = 99 T O 67 + 32 99
4. 29 + 49 = 78 T O 29 + 49 78	5. 42 + 27 = 69 T O 42 + 27 69	6. 18 + 72 = 90 T O 18 72 90
7. 89 + 10 = 99 T O 89 + 10 99	8. 64 + 27 = 91 T O 64 + 27 91	9. 56 + 38 = 94 T O 56 + 38 94

10. There were 54 doves sitting on an Oak tree. 26 robins flew to the Oak tree to sit. How many birds are on the Oak tree?

T O
54
+ 26
80

There are 80 birds on the oak Tree.

11. Third grade was visiting the Zoo. They saw 67 tigers and 28 lions. How many large cats did third graders see at the Zoo?

T O
67
28
95

Third graders Saw 95 large cats.

12. Miguel had a goal to read 87 pages of his book in two days. On the first day he read 48 pages. On the second day he read 39 more pages.

a. How many pages did Miguel read?

T O
1
48
+ 39
87

Miguel read 87 pages.

b. Did Miguel reach his goal?

He did reach his goal.

13. How do you know when to regroup, when adding?

When there are more than ten ones in the ones place you have to turn ten single ones into a ten & carry it to the tens place.

Name: ______________________ G3 U2 Lesson 3 - On Your Own

1. Solve. 59 + 33 = 92 T O 1 59 33 92	2. Solve. 28 + 62 = 90 T O 1 28 62 90
3. Solve. 37 + 65 = 102 T O 1 37 65 102	4. Solve. 39 + 11 = 50 T O 1 39 + 11 50

G3 U2 Lesson 4

Students will use place value to add three-digit numbers (standard algorithm with PV language)

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G3 U2 Lesson 4 - Students will use place value to add three-digit numbers

Warm Welcome (Slide 1): Tutor choice

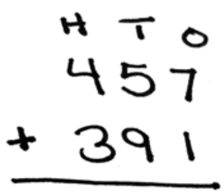
Frame the Learning/Connect to Prior Learning (Slide 2): Today we will use what we know about place value to add three-digit numbers. Now that we are adding three-digit numbers that means we have to use all that we know about the place value.

Let's Review (Slide 3-4): T You all have been working with two and three-digit numbers for a long time now! You became experts in three-digit numbers in second grade. Today, it's going to be important to remember that 10 ones make 1 ten. And, that 10 tens make one hundred. This will help us to add three digit numbers. Say it with me…10 ones make a ten! 10 tens make a hundred!

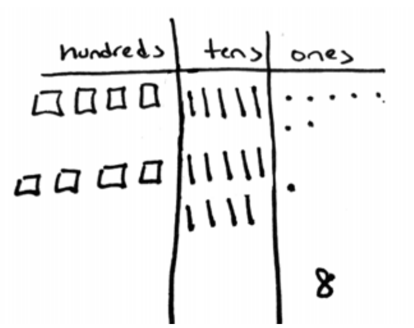
Let's Talk (Slide 5): Before we dive into today's learning. Let's think, **how could place value help us to add 457 + 391?** Possible Student Answers, Key Points:

- We can look at the ones place to help us combine ones with ones.
- We know we have to combine tens with tens.
- We also have to combine hundreds with hundreds.
- When we have ten or more ones, we must regroup or carry our new ten to the tens place.
- When we have ten or more tens, we must regroup or carry our new hundred to the hundreds place.

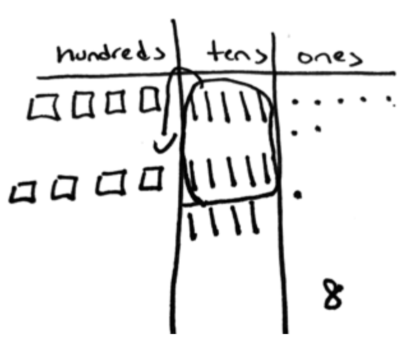
Let's Think (Slide 6): What great ideas! When we add or combine numbers, we must use place value to help us. Let's think about how we can add 457 + 391 using place value.



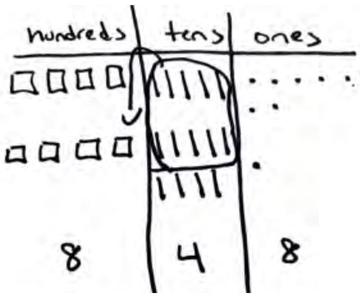
We know that place value is important so let's start by labeling the place of each digit. This will help me to make sure I am adding my ones with my ones and my tens with my tens and my hundreds with my hundreds. So I will label my ones place with an O, my tens place with T and my hundreds with an H.



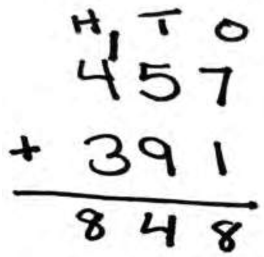
I can also model both addends to help me show how place value can help me add the ones with the ones and tens with the tens and hundreds with hundreds. I know that I am adding 457 with 391. I can model 4 hundreds in the hundreds place, 5 tens in the tens place and 7 ones in the ones place. Then I need to add 391. How many hundreds should I model? 3! THow many tens? 9! How many ones? 1! Now when I add I'm going to begin in the smallest place. I am adding three-digit numbers so I will begin in the ones place. This is very important because if there are more than ten ones, I MUST REGROUP! So I have 1,2,3,...8 ones (*model counting up all of the ones.*) .



Next I will move over to the tens place. Remember if I have more than ten tens, I MUST REGROUP! Let's count our tens…14! That is way too many for the tens place. I know that ten tens makes a hundred, and hundreds must go in the hundreds place! Each time I have ten or more tens, I must regroup and carry the hundred to the hundreds place. Count with me 1,2,3..10! I found ten tens, I must regroup! Circle the ten tens and regroup the ten tens into one hundred in the hundreds place. I must keep the remaining tens in the tens place. So that is 4 tens.



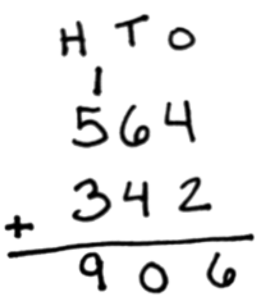
Finally I can add up ALL of my hundreds. 1,2,3,...8! We modeled how to add 457 + 391 and found the total or sum is 848.



We can also use place value to add when there are only digits! To make sure I am using place value to add, I can label my hundreds place with an H, my tens place a T and ones place with an O.

Next, I will line up my ones with my ones, my tens with my tens and hundreds with hundreds. We will begin by adding in the ones place. 7 + 1 is 8! So I have 8 ones total. Now I can add up my tens. 5 + 9 is 14. I know that 14 tens is the same as 10 tens and 4 more tens. I must regroup by carrying the 10 tens into the hundreds place. So I have 4 tens left in my tens place. Finally I can add ALL of my hundreds. 1 + 4 is 5. 5 + 3 is 8. DO you see how we were able to use place value to help us add three-digit numbers?

Let's Think (Slide 7): Let's try another one. Read the number sentence with me, 564 + 342. The first thing I'm going to do to make sure I am combining ones with ones, tens with tens and hundreds with hundreds is to label ones, tens and hundreds. So, let's start in the smallest place, the ones. Let's add.



So, 4 + 2 is 6.

Now I can add the tens. 6 + 4 is 10. I can't have ten or more in the tens place, so I must regroup. Watch me carry the hundred into the hundreds place. I have zero tens left in the tens place. I will write in zero in the answer space.

Now I can add ALL of my hundreds. 1 + 5 is 6 and 3 more is 9. So 564 + 342 = 906.

Let's Try it (Slides 9): Let's practice using place value to help us add three-digit numbers. We're going to work on this page, together step by step. As we are working we must remember to begin in the ones place and anytime we have more than ten ones… or ten tens… we MUST regroup!

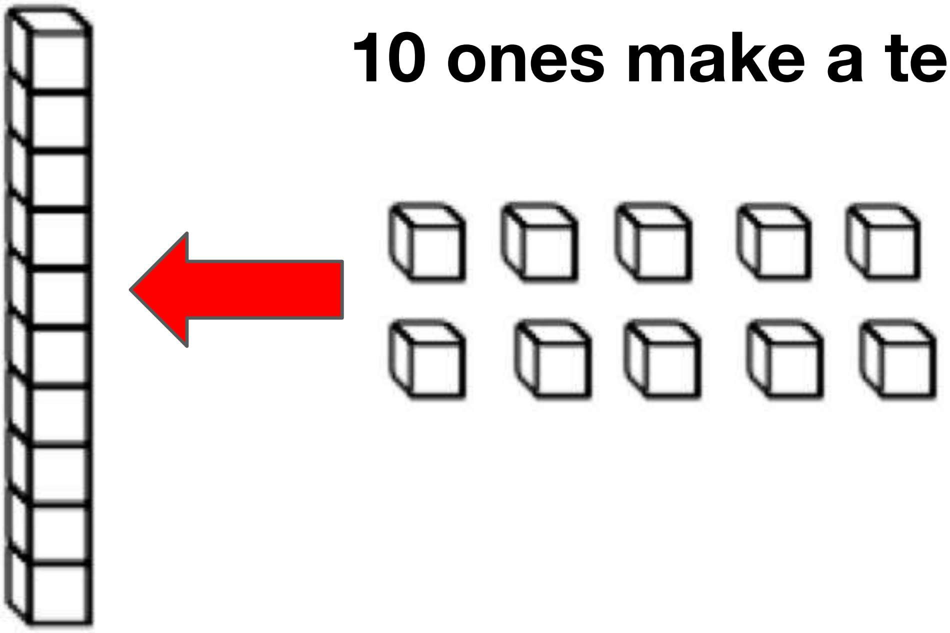
WARM WELCOME

(Tutors should adjust this slide for individual opening routine)

Today we will use place value to add three-digit numbers

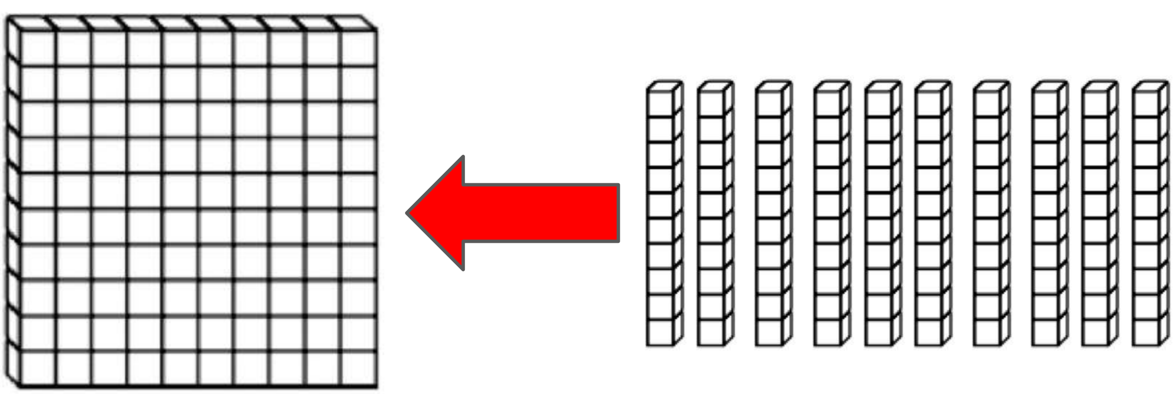
Let's Review:

10 ones make a ten!



Let's Review:

10 tens make a hundred!



Let's Talk:

How could place value help us to add 457 + 391?

Let's Think:

457 + 391 = ____

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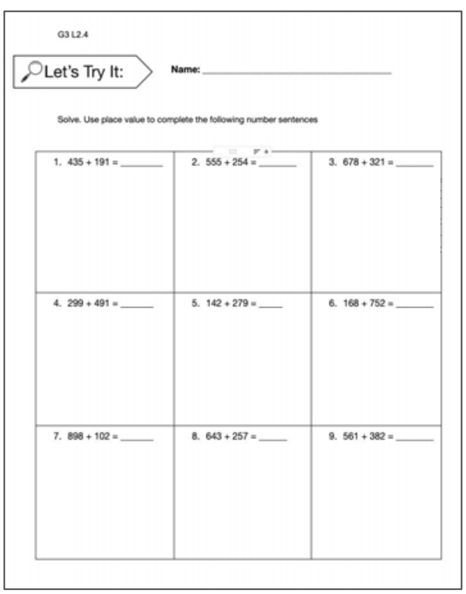
Let's Think:

$$564 + 342 = \_\_\_\_\_$$

Let's Try It:

Let's practice adding three-digit numbers, together!

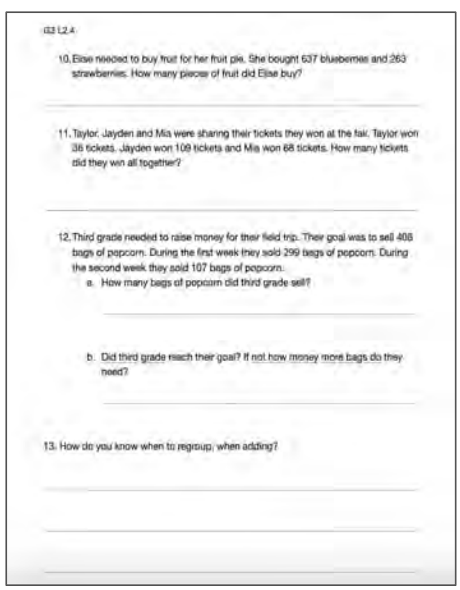


G3 L2.4

Let's Try It: Name: ____________

Solve. Use place value to complete the following number sentences

1. 435 + 191 = ______	2. 555 + 254 = ______	3. 678 + 321 = ______
4. 299 + 491 = ______	5. 142 + 279 = ______	6. 168 + 752 = ______
7. 898 + 102 = ______	8. 643 + 257 = ______	9. 561 + 382 = ______



G3 L2.4

10. Elise needed to buy fruit for her fruit pie. She bought 637 blueberries and 263 strawberries. How many pieces of fruit did Elise buy?

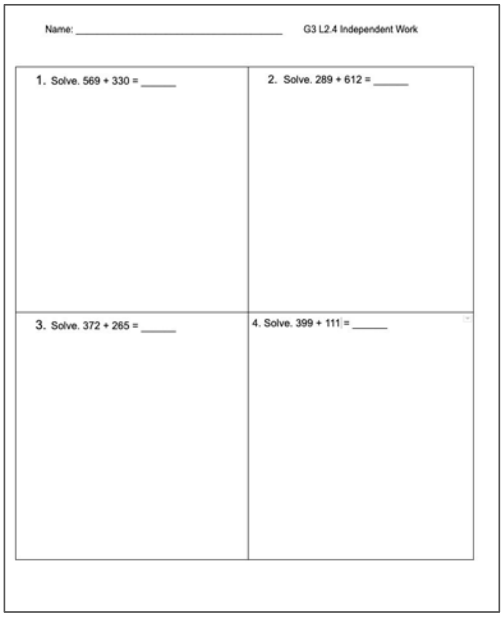
11. Taylor, Jayden and Mia were sharing their tickets they won at the fair. Taylor won 36 tickets. Jayden won 109 tickets and Mia won 68 tickets. How many tickets did they win all together?

12. Third grade needed to raise money for their field trip. Their goal was to sell 408 bags of popcorn. During the first week they sold 299 bags of popcorn. During the second week they sold 107 bags of popcorn.
    a. How many bags of popcorn did third grade sell?
    b. Did third grade reach their goal? If not how money more bags do they need?

13. How do you know when to regroup, when adding?

On your Own:

Now it's time to practice adding three-digit numbers on your own!


Name: ______________________ G3 L2.4 Independent Work

1. Solve. 569 + 330 = _____

2. Solve. 289 + 612 = _____

3. Solve. 372 + 265 = _____

4. Solve. 399 + 111 = _____

Name: ______________________________________

Solve. Use place value to complete the following number sentences

1. 435 + 191 = ________	2. 555 + 254 = ________	3. 678 + 321 = ________
4. 299 + 491 = _______	5. 142 + 279 = _____	6. 168 + 752 = ________
7. 898 + 102 = _______	8. 643 + 257 = ______	9. 561 + 382 = ________

10. Elise needed to buy fruit for her fruit pie. She bought 637 blueberries and 263 strawberries. How many pieces of fruit did Elise buy?

11. Taylor, Jayden and Mia were sharing their tickets they won at the fair. Taylor won 36 tickets. Jayden won 109 tickets and Mia won 68 tickets. How many tickets did they win all together?

1. Solve. **569 + 330 = ______**	2. Solve. **289 + 612 = ______**
3. Solve. **372 + 265 = ______**	4. Solve. **399 + 111 = ______**

Third grade needed to raise money for their field trip. Their goal was to sell 408 bags of popcorn. During the first week they sold 299 bags of popcorn. During the second week they sold 107 bags of popcorn.

a. How many bags of popcorn did third grade sell?

b. Did third grade reach their goal? If not, how many more bags do they need?

Name: ______________________________ G3 U2 Lesson 4 - Let's Try It

Solve. Use place value to complete the following number sentences

1. 435 + 191 = 626 H T O 435 + 191 626	2. 555 + 254 = 809 H T O 555 + 254 809	3. 678 + 321 = 999 H T O 678 + 321 999
4. 299 + 491 = 790 H T O 299 + 491 790	5. 142 + 279 = 421 H T O 142 + 279 421	6. 168 + 752 = 920 H T O 168 + 752 920
7. 898 + 102 = 1000 H T O 898 + 102 1000	8. 643 + 257 = 900 H T O 643 + 257 900	9. 561 + 382 = 843 H T O 561 + 382 843

10. Elise needed to buy fruit for her fruit pie. She bought 637 blueberries and 263 strawberries. How many pieces of fruit did Elise buy?

H T O
637
+ 263
900

Elise bought 900 pieces of fruit.

11. Taylor, Jayden and Mia were sharing their tickets they won at the fair. Taylor won 36 tickets. Jayden won 109 tickets and Mia won 68 tickets. How many tickets did they win all together?

H T O
109 > 17
68
+ 36
213

They won 213 all together.

12. Third grade needed to raise money for their field trip. Their goal was to sell 408 bags of popcorn. During the first week they sold 299 bags of popcorn. During the second week they sold 107 bags of popcorn.

a. How many bags of popcorn did third grade sell?

H T O
299
+ 107
406

They sold 406 bags of popcorn.

b. Did third grade reach their goal? If not, how many more bags do they need?

No, They need 2 more bags of popcorn to reach their goal of 408.

13. How do you know when to regroup when adding?

Anytime there are more than 10 ones you must regroup a ten into the tens place. Any time there are ten, tens in the tens place, you must regroup one hundred to the hundreds place.

Name: ______________________________ G3 U2 Lesson 4 - On Your own

1. Solve. 569 + 330 = 899

H T O
5 6 9
+ 3 3 0
8 9 9

2. Solve. 289 + 612 = 901

H T O
1 1
2 8 9
+ 6 1 2
9 0 1

3. Solve. 372 + 265 = 637

H T O
1
3 7 2
+ 2 6 5
6 3 7

4. Solve. 399 + 111 = 510

H T O
1 1
3 9 9
+ 1 1 1
5 1 0

G3 U2 Lesson 5

Students will use place value to subtract two-digit numbers (standard algorithm with PV language)

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G3 U2 Lesson 5- Students will use place value to subtract two-digit numbers

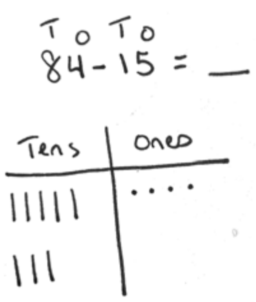
Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 3): Today we will use what we know about place value to subtract two-digit numbers. We will continue to think about the relationship between ones, tens and hundreds to help us subtract or take amounts away from a whole amount. Instead of combining or adding numbers to find a whole amount or total, we will be going the opposite direction. We will be taking numbers away from a whole.

Let's Talk (Slide 4): Before we dive into today's learning. Let's think about the following problem. Jayda has 2 eggs to make pancakes. But, she needs 6 eggs for the recipe. What could Jayda do? Possible student answers, key points:

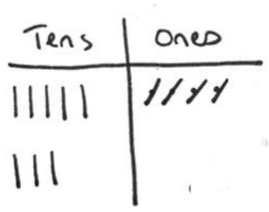
- She should borrow some from a friend
- She could ask her neighbor if they have any
- She could go to the store and buy some more
- She should not give up on the pancakes, she should find a way to get some more eggs

Let's Think (Slide 5): I heard some fantastic ideas. The main thing is that Jayda should not give up. In life when you do not have enough of something to complete a project, we do not just give up on our ideas, we find a way to borrow or get enough. Sometimes we even borrow from a friend or neighbor. I want us to really think about that today as we dive into subtraction.

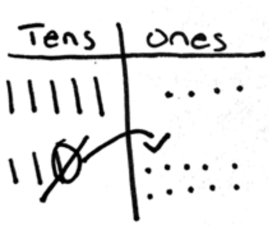


Let me show you what I mean. Let's solve the subtraction problem 84 - 15. It is so important that I take ones away from ones and tens away from tens. So, I will label each place to make sure I am keeping track of the values of each place. I see in the first number I have 8 tens and 4 ones.

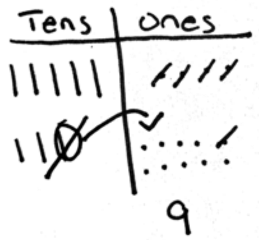
Watch as I model 8 tens in the tens place and 4 ones in the ones place. I need to subtract or take away one ten and five ones. Because I am taking that amount away, I will not model that amount. I will simply take it away.



Just like in addition we will begin in the smallest place. In the number 84 the smallest place is the ones place. I am subtracting 15, in the ones place I am taking away 5 ones. Let's try that. We can cross out each one as we count. Count with me…1,2,3,4–uh oh! I don't have enough to take all 5 ones away.

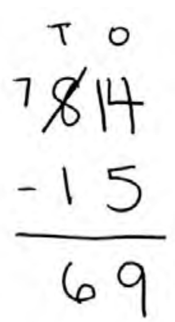


Remember Jayda borrowed eggs from a friend when she didn't have enough. We can also look at the tens place and break apart one ten into ten single ones. Watch me, I can take a ten from the tens place. I can break it back into ten single ones in the ones place. Then we will have enough ones to subtract.



Now I have 14 ones, I have enough to cross out 5. I will cross them out to show they are taken away. 1,2,3,4,5. Now I can count how many ones are left. Count with me…1,2,3,..9. So, we have 9 left in the ones place.

Now we can subtract in the tens place. There are now seven tens in the tens place. I have to subtract one ten. I will cross out one ten to show I took it away. Now I have six tens left in the tens place. So, 84 - 15 = 69.



Let's try to solve the same problem but this time with digits! In order to make sure I am taking ones away from ones and tens away from tens, I will stack my numbers by place.

I still need to start in the ones place and subtract ones from ones. So, 4 minus 5, I do not have enough! I do not have enough ones to subtract. I will look at my tens place, cross out one ten and break it apart in the ones place. Now, I can read it as 14 minus, or take away, 5. So, 14 - 5 is 9.

Finally I will look at the tens place and subtract. I don't have even tens take away three tens is 6 tens. So 84 - 15 = 69.

Let's Try it (Slides 6-7): Now let's work on subtracting two - digit numbers, together. We are going to work on this page, together step by step. Remember, anytime you do not have enough ones in the ones place to subtract, Go to the tens place, unpack one ten into ten single ones in the ones place!

WARM WELCOME

(Tutors should adjust this slide for individual opening routine)

Today we will use place value to subtract two-digit numbers

Let's Review:

Subtraction!

take-away   minus   whole - part = part

Let's Talk:

Jayda has 2 eggs to make pancakes. But, she needs 6 eggs for the recipe.
What could Jayda do?

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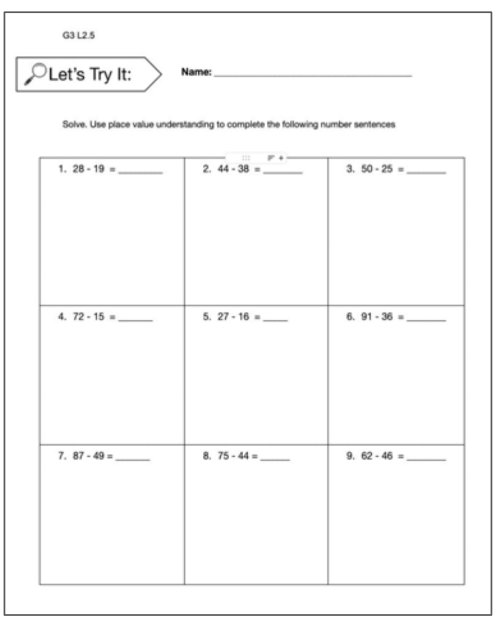
Let's Think:

84 - 15 = ____

Tens	Ones

Let's Try It:

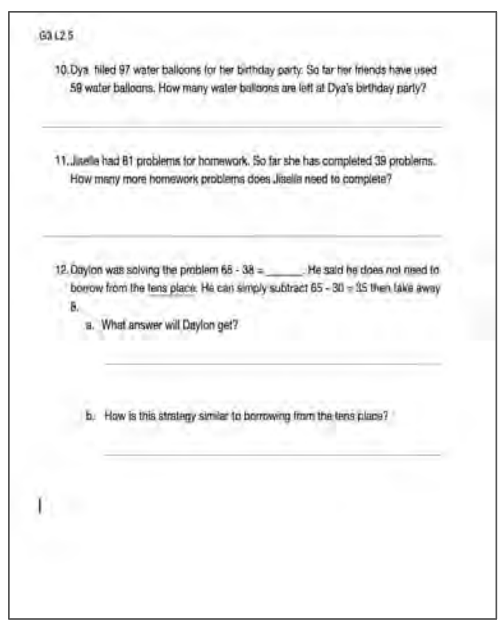
Let's practice subtracting two-digit numbers, together!


G3 L2.5

Let's Try It: Name: ____________

Solve. Use place value understanding to complete the following number sentences

1. 28 - 19 = ______	2. 44 - 38 = ______	3. 50 - 25 = ______
4. 72 - 15 = ______	5. 27 - 16 = ______	6. 91 - 36 = ______
7. 87 - 49 = ______	8. 75 - 44 = ______	9. 62 - 46 = ______


G3 L2.5

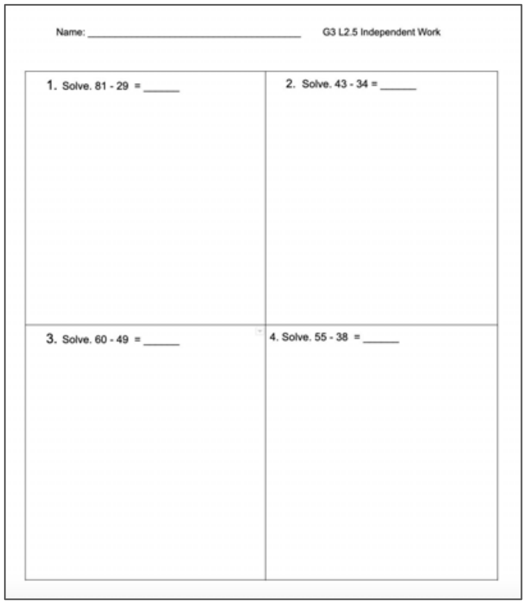
10. Dya filled 97 water balloons for her birthday party. So far her friends have used 58 water balloons. How many water balloons are left at Dya's birthday party?

11. Jiselle had 81 problems for homework. So far she has completed 39 problems. How many more homework problems does Jiselle need to complete?

12. Daylon was solving the problem 65 - 38 = ______. He said he does not need to borrow from the tens place. He can simply subtract 65 - 30 = 35 then take away 8.
    a. What answer will Daylon get?
    b. How is this strategy similar to borrowing from the tens place?

On your Own:

Now it’s time to practice subtracting two-digit numbers on your own!


Name: ______________________________ G3 L2.5 Independent Work

1. Solve. 81 - 29 = _____

2. Solve. 43 - 34 = _____

3. Solve. 60 - 49 = _____

4. Solve. 55 - 38 = _____

Name: ______________________________________ G3 U2 Lesson 5 - Let's Try It

Solve. Use place value understanding to complete the following number sentences

1. 28 - 19 = ________	2. 44 - 38 = ________	3. 50 - 25 = ________
4. 72 - 15 = _______	5. 27 - 16 = _____	6. 91 - 36 = ________
7. 87 - 49 = _______	8. 75 - 44 = ______	9. 62 - 46 = ________

10. Dya filled 97 water balloons for her birthday party. So far her friends have used 59 water balloons. How many water balloons are left at Dya's birthday party?

11. Jiselle had 81 problems for homework. So far she has completed 39 problems. How many more homework problems does Jiselle need to complete?

12. Daylon was solving the problem 65 - 38 = _______. He said he does not need to borrow from the tens place. He can simply subtract 65 - 30 = 35 then take away 8.

    a. What answer will Daylon get?

    b. How is this strategy similar to borrowing from the tens place?

Name: ____

1. Solve. **81 - 29 = ______**	2. Solve. **43 - 34 = ______**
3. Solve. **60 - 49 = ______**	4. Solve. **55 - 38 = ______**

Name: ______________________ G3 U2 Lesson 5 - On Your Own

Solve. Use place value understanding to complete the following number sentences

1. 28 - 19 = 09 T O 1 ~~2~~18 - 19 09	2. 44 - 38 = 06 T O 3 ~~4~~14 - 38 06	3. 50 - 25 = 25 4 ~~5~~10 - 25 25
4. 72 - 15 = 57 T O 6 ~~7~~12 - 15 57	5. 27 - 16 = 11 T O 27 - 16 11	6. 91 - 36 = 55 T O 8 ~~9~~11 - 36 55
7. 87 - 49 = 38 T O 7 ~~8~~17 - 49 38	8. 75 - 44 = 31 T O 75 - 44 31	9. 62 - 46 = 16 T O 5 ~~6~~12 - 46 16

10. Dya filled 97 water balloons for her birthday party. So far her friends have used 59 water balloons. How many water balloons are left at Dya's birthday party?

T O
8 9 17
- 59
38

There are 38 balloons left.

11. Jiselle had 81 problems for homework. So far she has completed 39 problems. How many more homework problems does Jiselle need to complete?

T O
7 8 11
- 39
42

Jiselle needs to complete 42 more problems.

12. Daylon was solving the problem 65 - 38 = _______. He said he does not need to borrow from the tens place. He can simply subtract 65 - 30 = 35 then take away 8.

a. What answer will Daylon get?

Daylon got 27.

b. How is this strategy similar to borrowing from the tens place?

Daylon still subtracted all of the tens and ones from 65. He also had to use a strategy to take 8 from 35. He could have used place value to subtract and then borrowed a ten. He also could have counted back.

Name: ______________________________ G3 U2 Lesson 5 - On Your Own

1. Solve. 81 - 29 = 52

T O

7

~~8~~11

\- 29

52

2. Solve. 43 - 34 = 09

T O

3

~~4~~13

\- 34

09

3. Solve. 60 - 49 = 11

T O

5

~~6~~10

\- 49

11

4. Solve. 55 - 38 = 17

T O

4

~~5~~15

\- 38

17

G3 U2 Lesson 6

Students will use place value to subtract three-digit numbers (standard algorithm with PV language)

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G3 U2 Lesson 6 - Students will use place value to subtract three-digit numbers

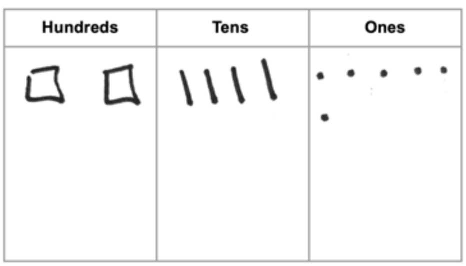
Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 3 & 4): Today we will use what we know about place value to subtract three-digit numbers. We will continue to think about the relationship between ones, tens and hundreds to help us subtract or take amounts away from a whole amount. Yesterday, we practiced borrowing from the tens place when we do not have enough ones to subtract. Today, we will think about the hundreds place as well as the tens and ones place.

Let's Talk (Slide 5): Before we dive into today's learning. Let's look at this math work from another student named jared. Jared solved the problem 74 - 28. Let's take a moment and discuss what he did well and what he can fix in his math work. Possible student answers, key points:

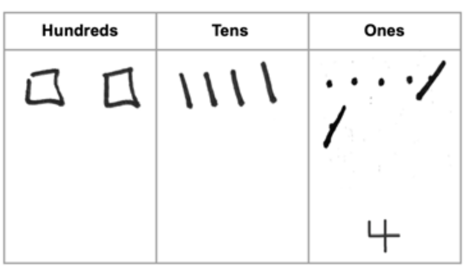
- He lined up his ones with the ones and tens with the tens.
- He knew to subtract because seven take away two is five.
- In the ones place he subtracted four from eight. He should have realized he did not have enough ones to subtract eight ones. He should go back and borrow a ten from the tens place. Then he would have enough ones in the ones place to subtract.

Let's Think (Slide 6): Exactly! Yesterday we were very careful to notice when we had enough to subtract and when we did not! Anytime we do not have enough, we can borrow from the place next door. Let me show you what I mean by subtracting three-digit numbers, today.

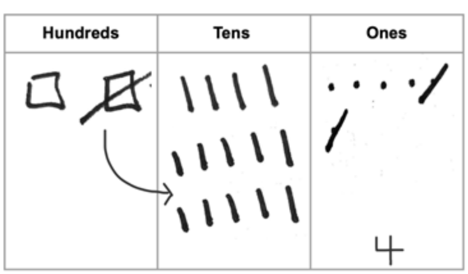


Let's solve the subtraction problem 246 - 172. It is so important that I take ones away from ones and tens away from tens AND hundreds away from hundreds. I will begin by modeling each digit in the whole. In the whole I have 2 hundreds, 4 tens and 6 ones. I need to subtract or take away 1 hundred, 7 tens and 2 ones.

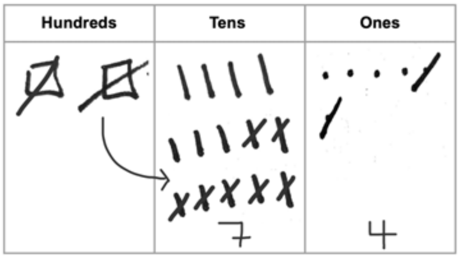
Because I am taking that amount away, I will not model that amount. I will simply take it away.



Just like in addition we will begin in the smallest place, in the number 276 - 172 that is the ones place. In the ones place there are 6 ones and we want to take away 2. Do we have enough to take away 2? Yes!

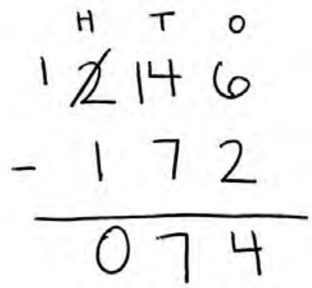


Now I will subtract in the tens place. There are four tens and I need to take away seven tens. Well, four is smaller than seven. I don't have enough tens to subtract. And, if we don't have enough, we can borrow from the hundreds place because one hundred is the same as 10 tens! Watch me, I'm going to cross out one hundred to regroup it into 10 tens. Now we have enough tens to subtract.



Now I have 14 tens, I need to subtract seven tens. I will cross them out to show they are taken away. 1,2,3,...7. Now I can count how many tens are left. 1,2,3,..7. I have 7 left in the tens place.

Now I can subtract in the hundreds place. There is now one hundred in the hundreds place. I have to subtract one hundred. I will cross out one hundred to show I took it away. Now I have 0 hundreds left in the hundreds place. So, 246 - 172 = 74.



Let's try again, this time with digits! In order to make sure I am taking ones away from ones, tens away from tens and hundreds from hundreds, I will stack my numbers by place and lavel.

We need to begin in the ones place and subtract ones from ones, 6 minus 4 is 2.

Now I can move to the tens place. Four minus seven… Uh oh! I do not have enough to subtract! I will look at my hundreds place, cross out one hundred and break it apart in the tens place. Now, I can read it as 14 minus or take away 7. 14 - 7 is 7 (*Model subtraction strategy as needed*).

Finally I will look at the hundreds place and subtract. 1 hundred take away 1 hundred is 0. So, 246- 172 = 74.

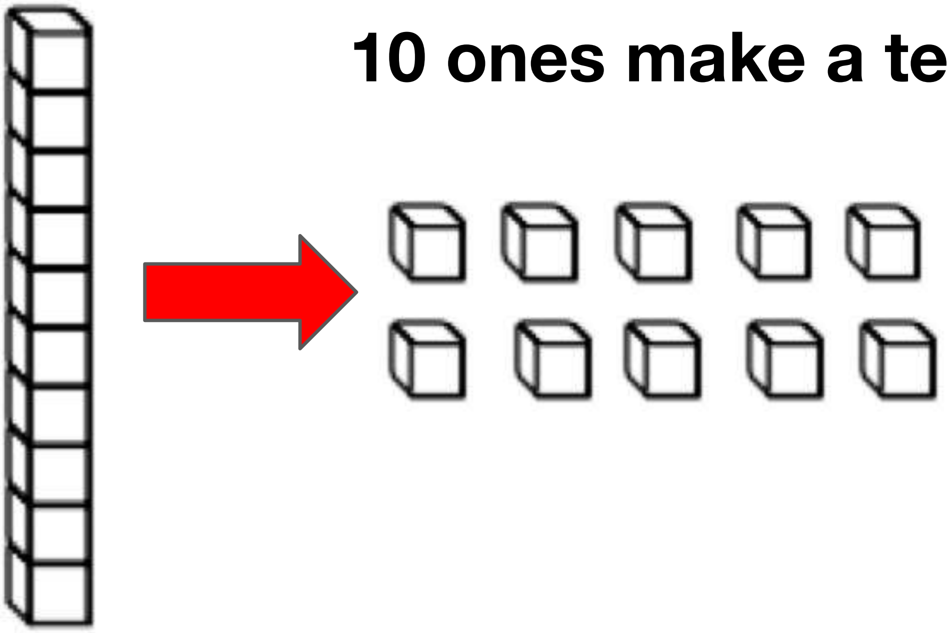
Let's Try it (Slides 8): Now let's work on subtracting three-digit numbers together. We are going to work on this page, together step by step. Remember, anytime you do not have enough ones or tens in the ones one tens place to subtract, Go to the next place and borrow.

WARM WELCOME

(Tutors should adjust this slide for individual opening routine)

Today we will use place value to subtract three-digit numbers

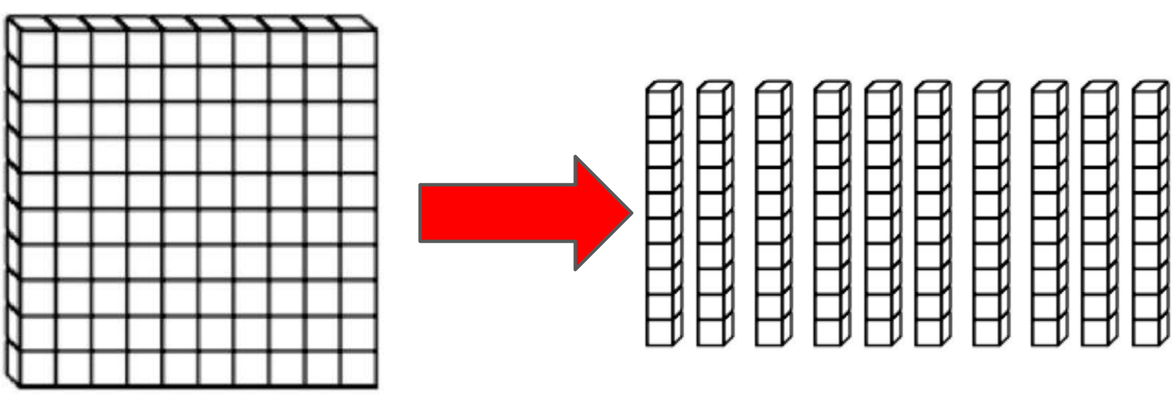
Let's Review:



10 ones make a ten!

Let's Review:

10 tens make a hundred!



Let's Talk:

Jared solved the problem 74 - 28. Jared's work is below. What did Jared do well? What does he need to fix to have an accurate answer?

$$
\begin{array}{rcc}
 & T & O \\
 & 7 & 4 \\
- & 2 & 8 \\
\hline
 & 5 & 4
\end{array}
$$

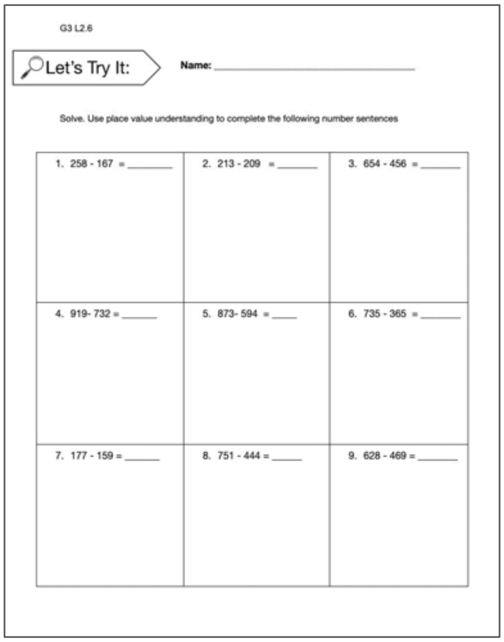
Let's Think:

246 - 172 = ____

Hundreds	Tens	Ones

Let's Try It:

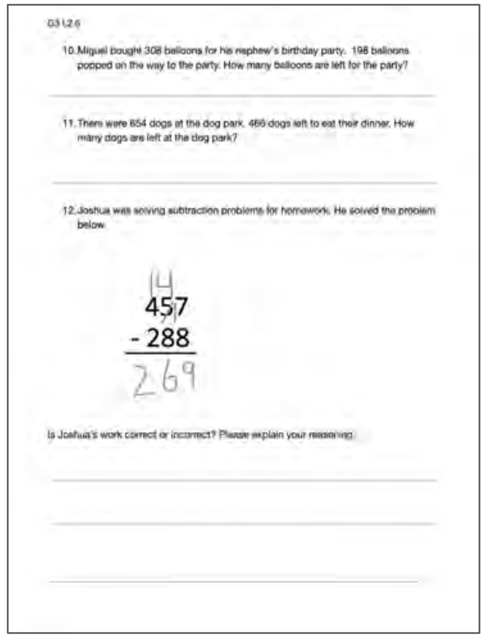
Let's practice subtracting three-digit numbers, together!


G3 L2.6

Let's Try It: Name: ______________________

Solve. Use place value understanding to complete the following number sentences

1. 258 - 167 = ______	2. 213 - 209 = ______	3. 654 - 456 = ______
4. 919- 732 = ______	5. 873- 594 = ______	6. 735 - 365 = ______
7. 177 - 159 = ______	8. 751 - 444 = ______	9. 628 - 469 = ______


G3 L2.6

10. Miguel bought 308 balloons for his nephew's birthday party. 198 balloons popped on the way to the party. How many balloons are left for the party?

11. There were 654 dogs at the dog park. 466 dogs left to eat their dinner. How many dogs are left at the dog park?

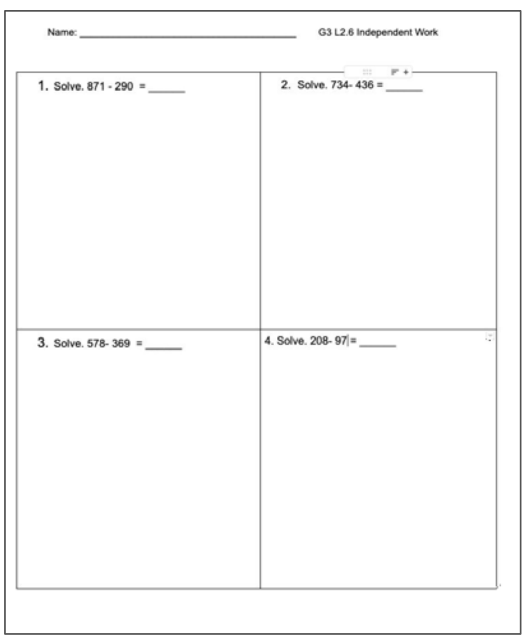
12. Joshua was solving subtraction problems for homework. He solved the problem below.

$$\begin{array}{r} 14 \\ 457 \\ -\ 288 \\ \hline 269 \end{array}$$

Is Joshua's work correct or incorrect? Please explain your reasoning.

On your Own:

Now it's time to practice subtracting two-digit numbers on your own!


Name: ______________________ G3 L2.6 Independent Work

1. Solve. 871 - 290 = ______	2. Solve. 734- 436 = ______
3. Solve. 578- 369 = ______	4. Solve. 208- 97 = ______

Name: ____

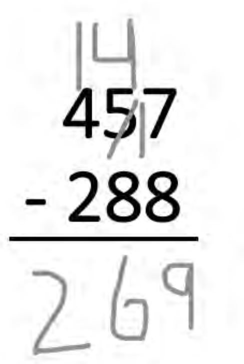
Solve. Use place value understanding to complete the following number sentences

1. 258 - 167 = ________	2. 213 - 209 = ________	3. 654 - 456 = ________
4. 919- 732 = _______	5. 873- 594 = _____	6. 735 - 365 = ________
7. 177 - 159 = _______	8. 751 - 444 = ______	9. 628 - 469 = ________

10. Miguel bought 308 balloons for his nephew's birthday party. 198 balloons popped on the way to the party. How many balloons are left for the party?

11. There were 854 dogs at the dog park. 466 dogs left to eat their dinner. How many dogs are left at the dog park?

12. Joshua was solving subtraction problems for homework. He solved the problem below.



Is Joshua's work correct or incorrect? Please explain your reasoning.

1. Solve. **871 - 290 = ______**	2. Solve. **734- 436 = ______**
3. Solve. **578- 369 = ______**	4. Solve. **208- 97 = ______**

Name: ______________________ G3 U2 Lesson 6 - Let's Try It

Solve. Use place value understanding to complete the following number sentences

1. 258 - 167 = 91 258 - 167 91	2. 213 - 209 = 4 213 - 209 004	3. 654 - 456 = 198 654 - 456 198
4. 919- 732 = 187 919 - 732 187	5. 873- 594 = 279 873 594 279	6. 735 - 365 = 370 735 - 365 370
7. 177 - 159 = 18 177 - 159 18	8. 751 - 444 = 307 751 - 444 307	9. 628 - 469 = 159 628 - 469 159

10. Miguel bought 308 balloons for his nephew's birthday party. 198 balloons popped on the way to the party. How many balloons are left for the party?

There are 110 balloons for the party.

$$\begin{array}{r} \overset{1}{2}\overset{10}{0}8 \\ -\,198 \\ \hline 110 \end{array}$$

11. There were 854 dogs at the dog park. 466 dogs left to eat their dinner. How many dogs are left at the dog park?

$$\begin{array}{r} \overset{7}{\cancel{8}}\overset{14}{\cancel{5}}\overset{1}{4} \\ 466 \\ \hline 388 \end{array}$$

There are 388 dogs left.

12. Joshua was solving subtraction problems for homework. He solved the problem below.

$$\begin{array}{r} 14 \\ 4\cancel{5}17 \\ -\,288 \\ \hline 269 \end{array}
\qquad
\begin{array}{r} \text{H T O} \\ 3\ 14 \\ \cancel{4}\cancel{5}17 \\ -\,2\ 8\ 8 \\ \hline 1\ 6\ 9 \end{array}$$

Is Joshua's work correct or incorrect? Please explain your reasoning.

Joshua's work is incorrect. When he needed a hundred to make ten tens in the tens place, he did not cross it out and take one away. Instead he add a hundred to the problem.

Name: ______________________________ G3 U2 Lesson 6 - On Your Own

1. Solve. 871 - 290 = 581

H T O

$$\begin{array}{r} \overset{7}{\cancel{8}}\,{}^{1}7\,1 \\ -\,2\,9\,0 \\ \hline 5\,8\,1 \end{array}$$

2. Solve. 734- 436 = 298

H T O

$$\begin{array}{r} \overset{6}{\cancel{7}}\,\overset{12}{\cancel{3}}\,{}^{1}4 \\ -\,4\,3\,6 \\ \hline 2\,9\,8 \end{array}$$

3. Solve. 578- 369 = 209

H T O

$$\begin{array}{r} 5\,\overset{6}{\cancel{7}}\,{}^{1}8 \\ -\,3\,6\,9 \\ \hline 2\,0\,9 \end{array}$$

4. Solve. 208- 97 = 111

H T O

$$\begin{array}{r} 2\,{}^{1}0\,8 \\ -\,9\,7 \\ \hline 1\,1\,1 \end{array}$$

G3 U2 Lesson 7

Students will use place value to subtract three-digit numbers with zeros (standard algorithm with PV language)

G3 U2 Lesson 7- Students will use place value to subtract three-digit numbers with zeros

Warm Welcome (Slide 1): Tutor choice

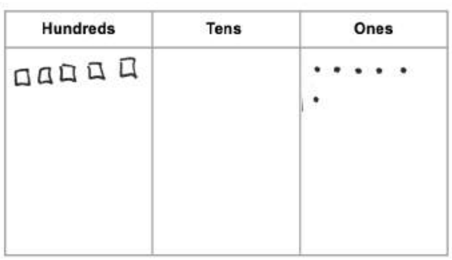
Frame the Learning/Connect to Prior Learning (Slide 3): Today we will use what we know about place value to subtract three-digit numbers with zeros!

Let's Talk (Slide 3): Let's talk about zeros. **What does zero mean? And, let's add to that, what does it mean when we have zero when we're subtracting?** Possible Student Answers, Key Points:

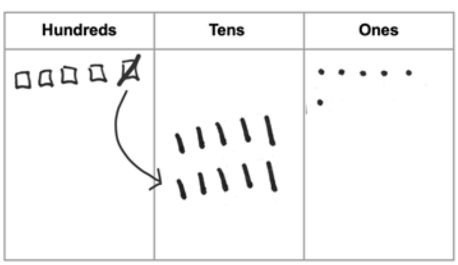
- Zero means nothing!
- If we take everything away, we have zero left. For example, 5 take away 5 is zero.
- If we take away zero, it doesn't change anything. For example 5 take away zero is 5.

Great job! Zero is a special number because it means NOTHING. Today we're going to subtract numbers that have zero in them. Sometimes, it'll be taking away zero. Sometimes it'll be taking everything away. And sometimes we'll have zero and we'll be asked to take something away from it. Today when we see a zero, I want us to slow down and really think about what the zero means based on where it is in our subtraction equation.

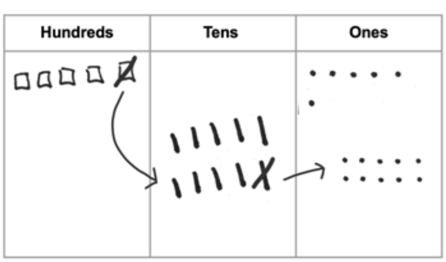
Let's Think (Slide 4): Let's work together to solve 506 - 148! I already see a zero, get ready!



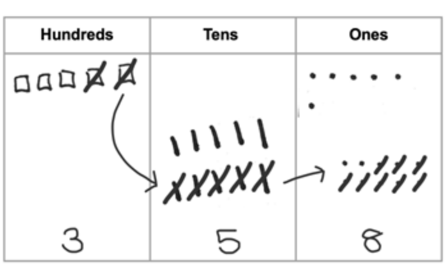
Let's begin by modeling the whole, 506. So I have 5 hundreds in the hundreds place and 0 tens in the tens place, hm how can I model that? Let's think.. 0 really means nothing. So If there are zero tens that means there are no tens there. I can leave it blank. Then I have 6 ones in the ones place.



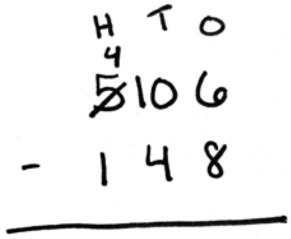
We will begin in the smallest place, the ones place. In the ones place there are 6 ones. I am meant to take away 8 ones. I know I don't have enough! I also see that I can't borrow from the tens place because there are zero or no tens.I remember there are ten ones in each ten. There are also ten tens in each hundred. I;m going to go borrow from the hundreds place. I know that one hundred is the same as ten tens. So, if I borrow one hundred I can put those ten tens in the tens place.



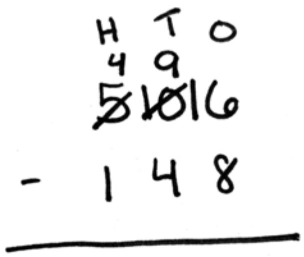
Now I have ten tens in the tens place but still not enough to subtract in the ones place! Well I know that when I do not have enough to subtract I can borrow from the next place. Now I have ten tens in the tens place I can borrow from the tens place to have enough ones in the ones place! So I will cross out one ten and place ten single ones in the ones place. NOW I can begin subtracting.



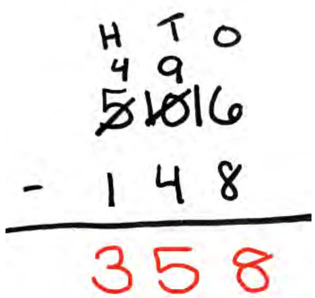
Now I have 16 ones, take 8 away that equals 8 (*model crossing out 8 ones on the place value chart*). In the tens place I have 9 tens take away 5 tens, that is 4 tens. In the hundreds place there are 4 hundreds, take 1 away that is 3 hundreds. So 506- 148 = 358.



Let’s take a look at what subtracting zeros looks like with just digits. As always, we make sure we line up ones with ones, tens with tens and hundreds with hundreds. Now Just like with the model, I don't have enough ones to subtract in the ones place. I also can't borrow from the tens place. I have to first borrow a hundred and place ten tens in the tens place.



I still am not ready to subtract in the ones place because I still don't have enough. I’m going to borrow one of the tens from the tens place. *(Cross out the 10 in the tens place and write 9 above the tens place.)* Now I have 9 tens in the tens place and 16 ones in the ones place.



Now I am ready to subtract! And when I subtract, I get the same answer, 358.

Let’s Try it (Slides 5-6): Now let’s work on subtracting three-digit numbers with zeros. We are going to work on this page, together step by step. Remember, anytime you do not have enough ones or tens, go to the next place and borrow.

WARM WELCOME

(Tutors should adjust this slide for individual opening routine)

Today we will use place value to subtract three-digit numbers with zeros

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Let's Talk:

What does **zero** mean?

Let's Think:

506 - 148 = ______

Hundreds	Tens	Ones

Let's Try It:

Let's practice subtracting three-digit numbers with zeros, together!

G3 L2.7

Let's Try It: **Name:** ______________________

Solve. Use place value understanding to complete the following number sentences

1. 400- 160 = ______	2. 209- 189 = ______	3. 300 - 108 = ______
4. 400 - 234 = ______	5. 600- 320 = ____	6. 100 - 47 = ______
7. 500 - 281 = ______	8. 700 - 571 = ____	9. 603 - 257 = ______

G3 L2.7

10. There were 700 seats in the school auditorium. Third grade used 326 seats.. Second grade needs the rest of the seats. How many seats does second grade need in the school auditorium?

11. Alayah has $900 in her bank account. She withdrew $458 to buy a new bicycle. How much money does Alayah have left in her bank account now?

On your Own:

Now it's time to practice subtracting three-digit numbers with zeros on your own!

Name: ______________________ G3 L2.7 Independent Work

1. Solve. 800 - 290 = _____	2. Solve. 704- 433 = _____
3. Solve. 500- 369 = _____	4. Solve. 200- 97 = _____

Name: ____

Solve. Use place value understanding to complete the following number sentences.

1. 400- 160 = _________	2. 209- 189 = ________	3. 300 - 108 = ________
4. 400 - 234 = _______	5. 600- 320 = _____	6. 100 - 47 = ________
7. 500 - 281 = _______	8. 700 - 571 = ______	9. 603 - 257 = ________

10. There were 700 seats in the school auditorium. Third grade used 326 seats. Second grade needs the rest of the seats. How many seats does second grade need in the school auditorium?

11. Alayah has $900 in her bank account. She withdrew $458 to buy a new bicycle. How much money does Alayah have left in her bank account now?

1. Solve. **800 - 290 = ______**	2. Solve. **704- 433 = ______**
3. Solve. **500- 369 = ______**	4. Solve. **200- 97 = ______**

Name: ______________________________ G3 U2 Lesson 7 -Let's Try It

Solve. Use place value understanding to complete the following number sentences.

1. 400- 160 = 240 H T O 400 - 160 240	2. 209- 189 = 20 H T O 209 - 189 20	3. 300 - 108 = 192 300 - 108 192
4. 400 - 234 = 166 400 - 234 166	5. 600- 320 = 280 H T O 600 - 320 280	6. 100 - 47 = 54 H T O 100 - 47 53
7. 500 - 281 = 219 500 - 281 219	8. 700 - 571 = 129 H T O 700 - 571 129	9. 603 - 257 = ________ H T O 603 - 257 346

10. There were 700 seats in the school auditorium. Third grade used 326 seats. Second grade needs the rest of the seats. How many seats does second grade need in the school auditorium?

Second grade needs 374 seats.

$$\begin{array}{r} \overset{6}{\cancel{7}}\,\overset{9}{\cancel{10}}\,10 \\ -\,3\,2\,6 \\ \hline 3\,7\,4 \end{array}$$

11. Alayah has $900 in her bank account. She withdrew $458 to buy a new bicycle. How much money does Alayah have left in her bank account now?

Alayah has $442 left in her bank account.

$$\begin{array}{r} \overset{8}{\cancel{9}}\,\overset{9}{\cancel{10}}\,10 \\ -\,4\,5\,8 \\ \hline 4\,4\,2 \end{array}$$

1. Solve. 800 - 290 = 510

H T O

$$\begin{array}{r} {\scriptstyle 7} \\ \cancel{8}\,{}^{1}0\,0 \\ -\;2\,9\,0 \\ \hline 5\,1\,0 \end{array}$$

2. Solve. 704- 433 = 271

H T O

$$\begin{array}{r} {\scriptstyle 6} \\ \cancel{7}\,{}^{1}0\,4 \\ -\;4\,3\,3 \\ \hline 2\,7\,1 \end{array}$$

3. Solve. 500- 369 = 131

H T O

$$\begin{array}{r} 4\,9 \\ \cancel{5}\,{}^{1}\cancel{0}\,{}^{1}0 \\ -\;3\,6\,9 \\ \hline 1\,3\,1 \end{array}$$

4. Solve. 200- 97 = 103

$$\begin{array}{r} 1\,9 \\ \cancel{2}\,{}^{1}\cancel{0}\,{}^{1}0 \\ -\;9\,7 \\ \hline 1\,0\,3 \end{array}$$

G3 U2 Lesson 8

Students will round to the nearest hundred (0-999)

G3 U2 Lesson 8 - Students will round to the nearest hundred (0-999)

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 3): Today we will use what we know about place value to round numbers to the nearest 100. Let's begin by playing a quick game. We are going to stand in a circle and count by 100s. This is a listening game. You have to be ready with the next 100. I'll start.

- *Start at 300, students should continue with 400, 500, etc. Allow the students to go past 900. They might get stuck.Tell them that 1000 is a hundred because it is the same as ten hundreds.*

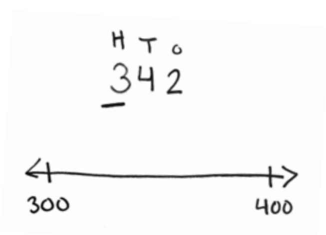
All of those numbers are hundreds. Today we will be looking for the nearest hundred that is closest to a number.

Let's Talk (Slide 4): Before we dive in, let's talk about number lines. If I gave you a number line with the endpoints of 300 and 400. Then I asked you to place the following cards on the number line, where would you put them and why? Possible Student Answers, Key Points:

- The cards should go in order from least to greatest beginning with 325; 359; 363 and 387 because number lines go in order and 300 was the left endpoint and 400 was the right endpoint.
- 325 was much closer to 300 than 387 because 325 is only 25 away from 300 and 387 is 87 away from 300, etc

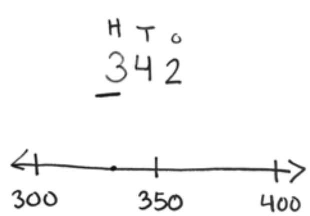
Let's Think (Slide 5): Today, we are going to use number lines to help us round numbers to the nearest hundred. When I am asked to round a number to the nearest hundred, I am being asked to find the closest hundred…either 100, 200, 300…all the way up to 1,000! Let me show you what I mean.

Let's look at this problem, it says "Round the number 342 to the nearest hundred." Well earlier we counted by hundreds. So we are looking for the hundred that is closest to 342. So that could be 100, 200, 300, 400, etc! I notice there are three hundreds in the hundreds place, then some tens and some ones.



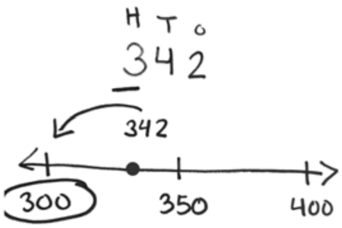
Because I am rounding to the nearest hundred, I will underline the 3 in the hundreds place and label each place like we've been doing in this unit. So I know that 342 is a number between 300 and 400. I can show that on a number line to help us.

At the beginning of our number line is 300, so I can write that at the beginning and 400 is at the end of the number line, so I can write that at the end of the number line. Remember, when we are rounding we are looking for the hundred that 342 is closest too.



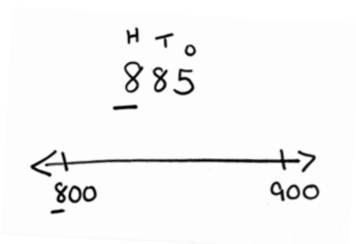
When we're rounding, the halfway point is really important because it will help us determine which hundred 342 is closest too. We know that half of one hundred is fifty. So, 350 is halfway between 300 and 400.

I can mark 350 on the number line to help me round because if a number is less than halfway then it is closer to the smaller hundred. If the number I am rounding is on the halfway mark or higher, then it is closer to the larger hundred.

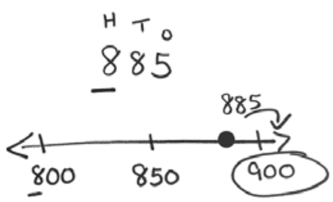


Finally I am ready to place 342 on the number line. I am looking for the nearest hundred. So the tens place will help me know where it goes on the number line. In this number I have 3 hundreds and 4 tens. So, 4 tens will go right before the halfway mark of 5 tens or 350. Now I can see that 342 is closer to 300 than 400. So 342 rounded to the nearest hundred is 300.

Let's Think (Slide 6): Let's look at another problem. It says, round 885 to the nearest hundred. Because I am rounding a three-digit number to the nearest hundred, I need to underline the 8 in the hundreds place. Let's begin by using the hundreds place. So, 885 is between 800 and…the next hundred. If I'm stuck, I can count by hundreds 800, 900 … yes, the next hundred would be 900!



My number line will start at 800 and end at 900 since 885 is between those two hundreds. I will also write in the halfway point because that will help me determine if 885 is closer to 800 or 900. What is halfway between 800 and 900? 50 is half of 100 so 850 would be halfway between 800 and 900.



Now we can write in our halfway mark to help us decide if 885 is closer to 800 or 900. Now, Let's look at our tens place because that will tell us where on the number line to write 885. I see 8 tens. 8 tens will be after 850 on the number line because 8 tens is three more tens than 850. Now I see 885 is much closer to 900 than 800. So, 885 rounded to the nearest hundred is 900.

Let's Try it (Slides 7-8): Now let's work on rounding three-digit numbers to the nearest hundred. We are going to work on this page together step-by-step. Remember, if the number is below the halfway point, we round down! If the number is ON the halfway point or above it, we round up to the next hundred

WARM WELCOME

(Tutors should adjust this slide for individual opening routine)

Today we will round to the nearest hundred

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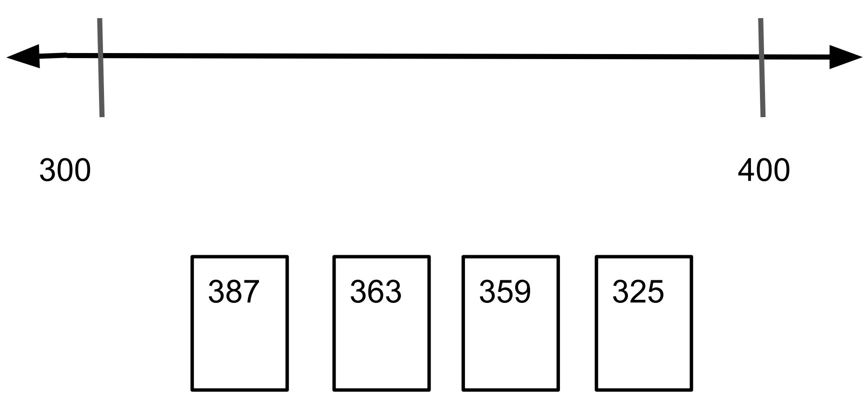
Let's Review:

Let's count by 100s!

Let's Talk:



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Let’s Think:

Round the number 342 to the nearest hundred.

Let’s Think:

Round the number 885 to the nearest hundred.

Let's Try It:

Let's practice rounding to the nearest hundred, together!

G3 L2.8

Let's Try It: Name: ______________________

Round the following number to the nearest hundred.

1. 672	2. 894
3. 350	4. 255
5. 129	6. 943

G3 L2.8

7. An airplane flew about 462 miles from Chicago to Washington DC. About how many miles did the plane travel?

8. I am thinking of a secret number. When rounded to the nearest hundred the answer is 300. What is the smallest number that rounds to 300 when rounded to the nearest hundred.

9. Kali was rounding three-digit numbers to the nearest hundred in class. She rounded the number 545 to 600 because it was close to the halfway point. Explain why Kali is incorrect.

10. Circle all of the numbers that round to 400 when rounding to the nearest hundred.

[illegible]

On your Own:

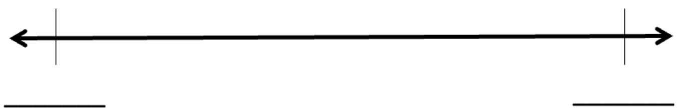
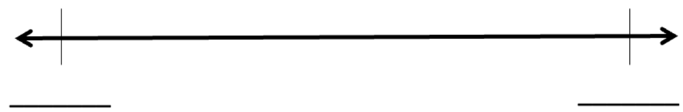
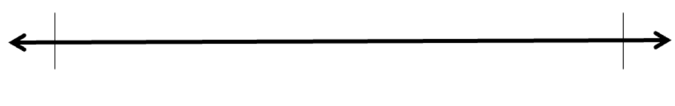
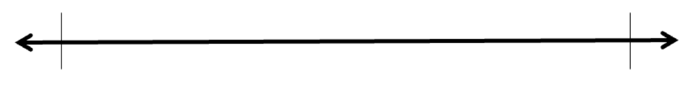
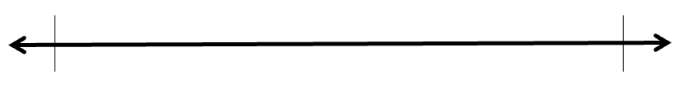
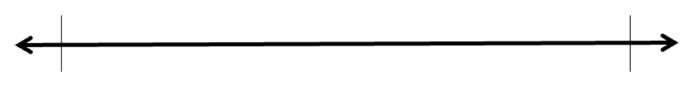
Now it's time to practice rounding numbers to the nearest hundred on your own!

Name: ______________________ G3 L2.8 Independent Work

1. Round 405 to the nearest hundred	2. Round 250 to the nearest hundred
3. Round 910 to the nearest hundred	4. Round 634 to the nearest hundred

Name: ______________________________________ G3 U2 Lesson 8 - Let's Try It

Round the following number to the nearest hundred.

672  Answer: ____________	**894**  Answer: ____________
350  Answer: ____________	**255**  Answer: ____________
129  Answer: ____________	**943**  Answer: ____________

Circle all of the numbers that round to 400 when rounding to the nearest hundred.

423 502 451 398 349 352 401

An airplane flew about 462 miles from Chicago to Washington DC. **About** how many miles did the plane travel?

I am thinking of a secret number. When rounded to the nearest hundred the answer is 300. What is the smallest number that rounds to 300 when rounded to the nearest hundred.

Kali was rounding three-digit numbers to the nearest hundred in class. She rounded the number 545 to 600 because it was close to the halfway point. Explain why Kali is incorrect.

Name: ______________________________

1. Round 195 to the nearest hundred. _____ _____ Answer: __________	2. Round 612 to the nearest hundred. _____ _____ Answer: __________
3. Round 905 to the nearest hundred. _____ _____ Answer: __________	4. Round 534 to the nearest hundred. _____ _____ Answer: __________

Select all of the numbers that round to 100 when rounding to the nearest hundred.

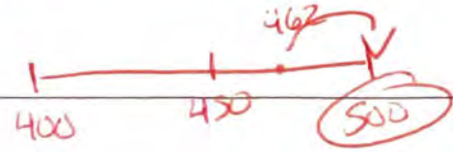
- ☐ 152
- ☐ 71
- ☐ 129
- ☐ 150
- ☐ 50
- ☐ 29
- ☐ 199

Name: ______________________ G3 U2 Lesson 8 - Let's Try It

Round the following number to the nearest hundred.

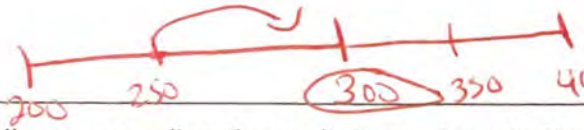
HTO 672 672 600 650 700	HTO 894 894 800 850 900
HTO 350 350 300 350 400	255 255 200 250 300
129 129 100 150 200	943 943 900 950 1000

7. An airplane flew about 462 miles from Chicago to Washington DC. About how many miles did the plane travel?



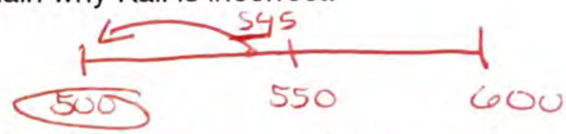
The plane traveled about 500 miles

8. I am thinking of a secret number. When rounded to the nearest hundred the answer is 300. What is the smallest number that rounds to 300 when rounded to the nearest hundred.



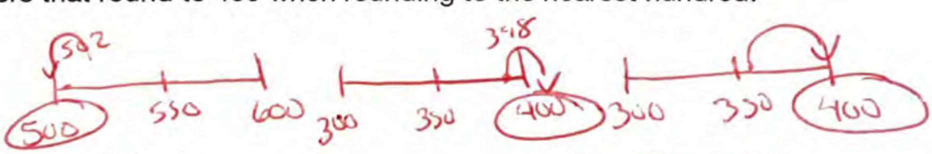
The smallest number is 250.

9. Kali was rounding three-digit numbers to the nearest hundred in class. She rounded the number 545 to 600 because it was close to the halfway point. Explain why Kali is incorrect.



545 is closer to 500 than 600 because there are 4 tens in the tens place. 550 is exactly half way between 500 and 600. Any number less than half way will be closer to the lower hundred.

10. Circle all of the numbers that round to 400 when rounding to the nearest hundred.



423 ~~502~~ ~~451~~ 398 ~~349~~ 352 401

Name: ______________________________ G3 U2 Lesson 8 - On Your Own

1. Round 195 to the nearest hundred.

HTO

195

100 150 200

2. Round 612 to the nearest hundred.

HTO

600 650 700

3. Round 905 to the nearest hundred.

HTO

905

900 950 1000

4. Round 534 to the nearest hundred.

HTO

534

500 550 600

G3 U2 Lesson 9

Students will round to the nearest ten (0-99)

G3 U2 Lesson 9 - Students will round to the nearest ten (0-99)

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 3): Today we will use what we know about place value to round numbers to the nearest ten. Let's begin by playing a quick game. We are going to stand in a circle and count by 10s. This is a listening game. You have to be ready with the next 10. I'll start.

- *Start with 10, students should continue with 20, 30, etc. Allow the students to go past 90. They might get stuck. That is ok, tell them that 100 is a ten because it is the same as ten tens.*
- *If time allows, play again starting at 90* and past 100

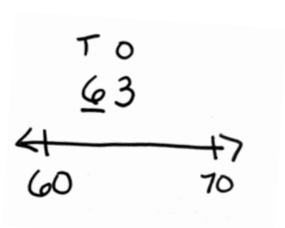
All of those numbers are tens. Today we will be rounding to the nearest ten.

Let's Talk (Slide 4): Yesterday, we rounded numbers to the nearest hundred. Today we will round two-digit numbers to the nearest ten. How do you think rounding to the nearest ten might be similar to rounding to the nearest hundred? Possible Student Answers, Key Points:

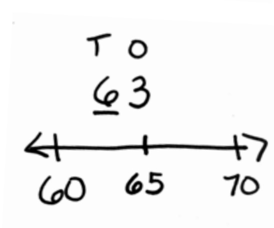
- We could use a number line to find the nearest tens a number is in between.
- A halfway mark could help us, but it will be 5 not 50.
- We are still looking for a ten that is nearest to another number.
- We will be looking for the closest tens and not hundreds.
- The halfway mark will be half of ten and not half of one hundred.

Let's Think (Slide 5): Those are all great ideas! We are going to use number lines to help us round numbers to the nearest 10, today! When I am asked to round a number, I am being asked to find another number that is close to the number I am rounding. Let me show you what I mean.

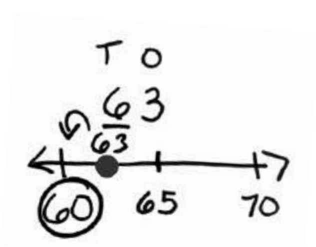
Let's look at this problem, it's asking me to round the number 63 to the nearest ten. Well earlier we counted by tens. So we are looking for the ten that is closest to 63. So that could be 10, 20, 30, 40, etc! In the number 63, I notice there are six tens in the tens place, then some ones.



I am going to underline the 6 in the tens place to help me focus on finding the nearest ten. So I know that 63 is a number between 60 and the next ten is 70. I can show that on a number line to help us. Remember, when we are rounding to the nearest ten, we are looking for the ten that 63 is closest to.

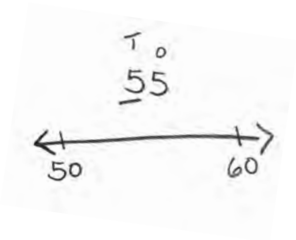


Just like yesterday, the halfway point is important! If we mark halfway, that will help us determine which ten 63 is closest too. The halfway mark helps me round because if a number is less than halfway then it is closer to the smaller ten. If the number I am rounding is on the halfway mark or higher, then it is closer to the larger ten. Half of ten is five. So, halfway in between sixty and seventy is sixty five. I can mark sixty five on the number line to help me round.

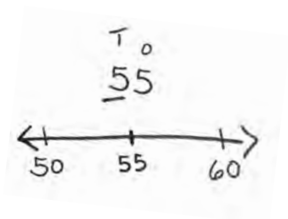


Finally I am ready to place 63 on the number line. I am looking for the nearest ten. So, the ones place will help me know where it goes on the number line. In this number I have three ones. Three ones will go right before the halfway mark of five ones. Now I can see that 63 is closer to 60 than 70. So 63 rounded to the nearest ten is 60.

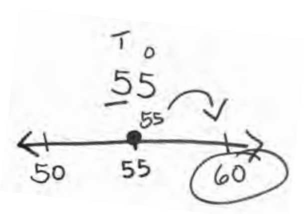
Let's Think (Slide 6): Let's look at another problem. Let's round 55 to the nearest ten. I am rounding a two-digit number to the nearest ten.



I'm going to labl my number line with 50 and 60 because 55 is between those two tens. I will also write in the halfway point because that will help me determine if 55 is closer to 50 or 60. What is halfway between 50 and 60? 55!



Exactly. Now we can write in our halfway mark to help us decide if 55 is closer to 50 or 60. Look at this, I notice that our halfway mark is the same as the number we are rounding to the nearest ten.



When a number is exactly halfway, we round to the next ten. So, 55 rounded to the nearest ten is 60.

Let's Try it (Slides 7): Now let's work on rounding two-digit numbers to the nearest ten. We are going to work on this page, together step by step. Remember, using a number line and the halfway point will help us to round!

WARM WELCOME

(Tutors should adjust this slide for individual opening routine)

Today we will round to the nearest ten

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Let's Review:

Count by 10s!

Let's Talk:

How might rounding to the nearest ten be similar to rounding to the nearest hundred?

How might rounding to the nearest ten be different than rounding to the nearest hundred?

Let's Think:

Let's round the number 63 to the nearest ten.

Let's Think:

Round 55 to the nearest ten.

Let's Try It:

Let's practice rounding to the nearest ten, together!

G3 L2.9

Let's Try It: Name: ____________________

Round the following number to the nearest ten.

1. 62	2. 88
3. 35	4. 55
5. 12	6. 98

G3 L2.9

7. Over the summer vacation, Alice read 28 books. About how many books did Alice read?

8. I am thinking of a secret number. When rounded to the nearest ten the answer is 50. What is the smallest number that rounds to 50 when rounded to the nearest ten?

9. Chelsea was rounding two-digit numbers to the nearest ten in class. She rounded the number 99 to 90 because 100 is not a ten. PLease explain the error in Chelsea's reasoning.

10. Circle all of the numbers that round to 30 when rounding to the nearest ten.

23 32 27 36 25 33 34

On your Own:

Now it's time to practice rounding numbers to the nearest ten on your own!

Name: ____________________ G3 L2.9 Independent Work

1. Round 45 to the nearest hundred	2. Round 51 to the nearest hundred
3. Round 91 to the nearest hundred	4. Round 68 to the nearest hundred

Name: ____ G3 U2 Lesson 9 - Let’s Try It

Round the following number to the nearest ten.

62 ______ ______ Answer: ____________	**88** ______ ______ Answer: ____________
35 ______ ______ Answer: ____________	**55** ______ ______ Answer: ____________
12 ______ ______ Answer: ____________	**98** ______ ______ Answer: ____________

Circle all of the numbers that round to 30 when rounding to the nearest ten.

23 32 27 35 25 33 24

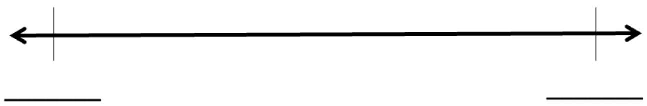
Over the summer vacation, Alice read 28 books. **About** how many books did Alice read?

I am thinking of a secret number. When rounded to the nearest ten the answer is 50. What is the smallest number that rounds to 50 when rounded to the nearest ten?

Chelsea was rounding two-digit numbers to the nearest ten in class. She rounded the number 99 to 90 because 100 is not a ten. Please explain the error in Chelsea's reasoning.

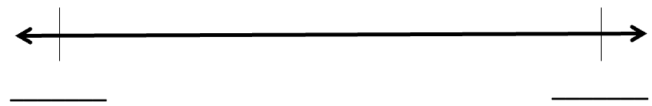
Name: ______________________________ G3 U2 Lesson 9 - Independent Work

1. Round 45 to the nearest ten.



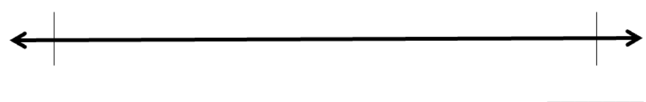
Answer: ____________

2. Round 51 to the nearest ten.



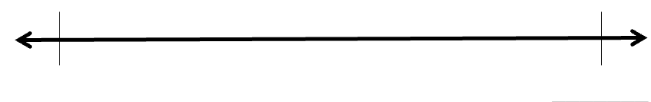
Answer: ____________

3. Round 91 to the nearest ten.



Answer: ____________

4. Round 68 to the nearest ten.



Answer: ____________

Select all of the numbers that round to 70 when rounding to the nearest ten.

- ☐ 77
- ☐ 66
- ☐ 71
- ☐ 79
- ☐ 17
- ☐ 62
- ☐ 69

Name: ______________________ G3 U2 Lesson 9 - Let's Try It

Round the following number to the nearest ten.

1. 62 62 60 65 70	2. 88 88 80 85 90
3. 35 35 30 35 40	4. 55 55 50 55 60
5. 12 12 10 15 20	6. 98 98 90 95 100

7. Over the summer vacation, Alice read 28 books. About how many books did Alice read?

28

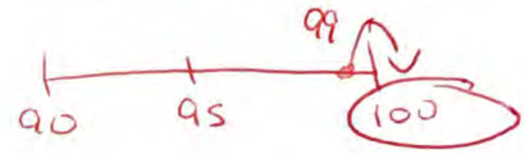
20 25 30

Alice read about 30 books.

8. I am thinking of a secret number. When rounded to the nearest ten the answer is 50. What is the smallest number that rounds to 50 when rounded to the nearest ten?

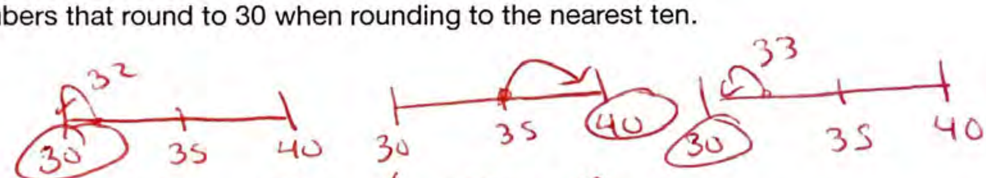
45 is the smallest number that rounds to 50.

9. Chelsea was rounding two-digit numbers to the nearest ten in class. She rounded the number 99 to 90 because 100 is not a ten.
PLease explain the error in Chelsea's reasoning.

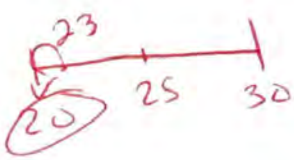


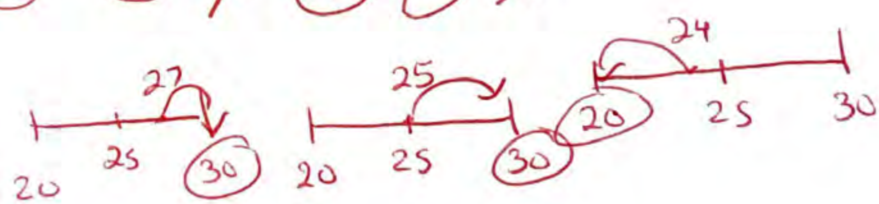
The answer should be 100. 100 is a ten because ten tens is the same as 100.

10. Circle all of the numbers that round to 30 when rounding to the nearest ten.



~~23~~ 32 27 ~~35~~ 25 33 ~~24~~





Name: ____________________ G3 U2 Lesson 9 - On Your Own

1. Round 45 to the nearest ten.

45

40 45 50

2. Round 51 to the nearest ten.

51

50 55 60

3. Round 91 to the nearest ten.

91

90 95 100

4. Round 68 to the nearest ten.

68

60 65 70

G3 U2 Lesson 10

Students will round to the nearest ten (0-999)

G3 U2 Lesson 10- Students will round to the nearest ten (0-999)

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 3): Today we will use what we know about place value to round two-digit AND three-digit numbers to the nearest ten. Let's begin by playing a quick game. We are going to stand in a circle and count by 10s. This is a listening game. You have to be ready with the next 10. I'll start.

- *Start at 190, students should continue with 200, 210, etc. Allow the students to go across hundreds. This is the most challenging day of rounding for students so spend extra time practicing tens today.*

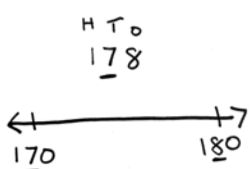
Nice work, all of those numbers are tens. Today we will be looking for the nearest ten to another number.

Let's Talk (Slide 4): Yesterday, we rounded two-digit numbers to the nearest ten. Today we will round two-digit and three-digit numbers to the nearest ten. Before we get started let's take a look at another student's work. Zayvion was practicing rounding numbers to the nearest ten. He was rounding 96 to the nearest ten. He answered 95. Why is Zayvion incorrect? Possible Student Answers, Key Points:

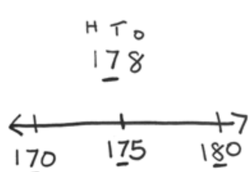
- Ninety five is not a ten because it ends in a five. Ninety five is halfway between ninety and one hundred.
- Ninety six is closer to 100 than ninety. .
- One hundred is also a ten, it is the same as 10 tens.

Let's Think (Slide 5): Those are all great ideas! When we round numbers to the nearest ten, it is really important that we think about the value of our hundreds place to help us. Today, we are going to use number lines to help us round numbers to the nearest 10! When I am asked to round a number, I am being asked to find another number that is close to the number I am rounding. Let me show you what I mean.

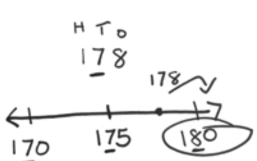
Let's look at this problem, it says round the number 178 to the nearest ten. Now, this is tricky because we are rounding a three-digit number to the nearest ten, not hundred. That means that we are looking for the ten that is closest to 178. So that could be 160,170, 180 etc! In the number 178, I notice there are seven tens in the tens place and then some ones.



I am going to underline the 7 in the tens place to remind myself that I am rounding to the nearest ten, not hundred. So I know that 178 is a number between 170 and 180. I can show that on a number line to help us.

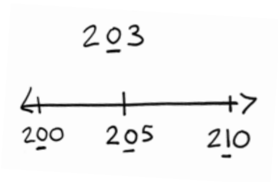


We've been working on rounding for two days now so we know that the halfway mark is really important! So, since we're rounding to the nearest ten, half of ten is five. So, halfway between 170 and 180 is 175. Let's mark 175 on the number line to help us round.

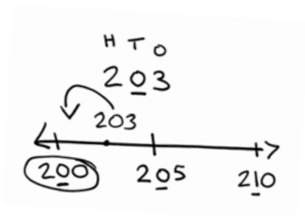


Finally we're reading to place 178 on the number line. The ones place will help me know where it goes on the number line. In this number I have eight ones. 8 ones will go after the halfway mark of 5 ones. Now I can see that 175 is closer to 180 than 170. So, 178 rounded to the nearest ten is 180.

Let's Think (Slide 6): Let's look at another problem. We want to round 203 to the nearest ten. Let's make sure we underline the tens place to keep track of our tens. This is interesting, 203 has zero tens, so 200 is one of the tens 203 is in between.



Now I have to make sure I dont add the next hundred, I am looking for the next ten! That is 210. Now, let's write the halfway point. What's the halfway point between 200 and 210? 205! Exactly. Now we can write in our halfway mark to help us decide if 203 is closer to 200 or 210.



Finally I can write 203 on the number in line a little bit in front of the halfway mark. So, I see that 203 is closer to 200 than 210. Our answer is 200.

Did you see how I had to pay very special attention to the tens place when finding the nearest tens? When we are rounding to the nearest tens place with three-digit numbers, we have to stop and think about the value of the tens place before taking the next step.

Let's Try it (Slides 7): Now let's work on rounding two-digit and three-digit numbers to the nearest ten. We are going to work on this page together. Remember, pay special attention to the tens place especially when you're rounding three-digit numbers to the nearest ten.

WARM WELCOME

(Tutors should adjust this slide for individual opening routine)

Today we will round three-digit numbers to the nearest ten

Let's Review:

Count by 10s!

Let's Talk:

Zayvion was rounding numbers to the nearest ten. He rounded 96 to 95.

Why is Zayvion incorrect?

Let’s Think:

Round the number 178 to the nearest ten.

Let’s Think:

Round 203 to the nearest ten.

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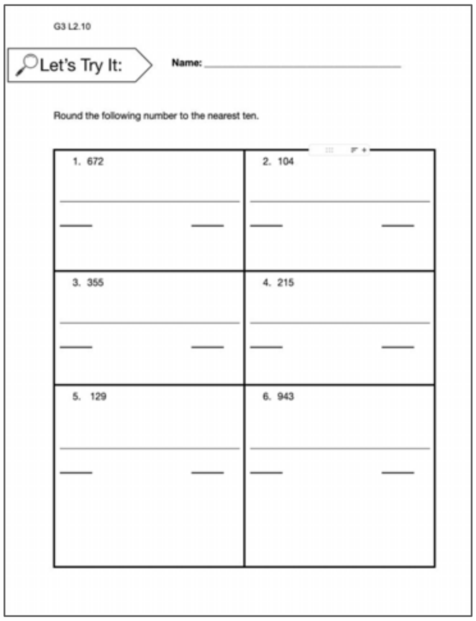
Let's Try It:

Let's practice rounding three-digit numbers to the nearest ten, together!

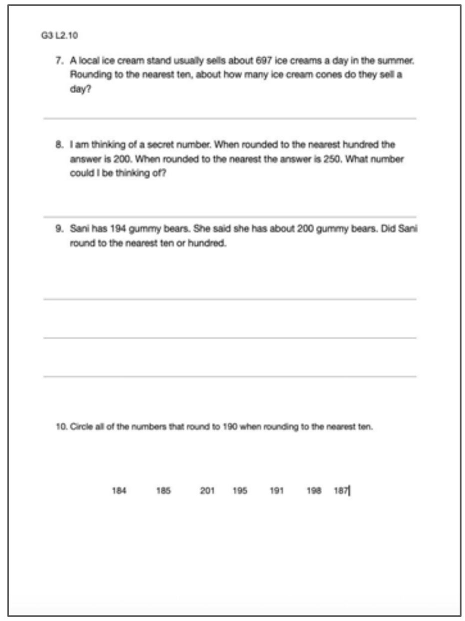


G3 L2.10

Let's Try It: Name: ______________________

Round the following number to the nearest ten.

1. 672	2. 104
3. 355	4. 215
5. 129	6. 943



G3 L2.10

7. A local ice cream stand usually sells about 697 ice creams a day in the summer. Rounding to the nearest ten, about how many ice cream cones do they sell a day?

8. I am thinking of a secret number. When rounded to the nearest hundred the answer is 200. When rounded to the nearest the answer is 250. What number could I be thinking of?

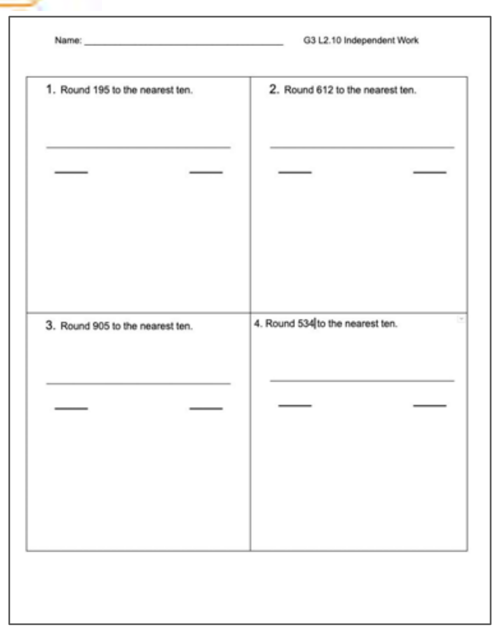
9. Sani has 194 gummy bears. She said she has about 200 gummy bears. Did Sani round to the nearest ten or hundred.

10. Circle all of the numbers that round to 190 when rounding to the nearest ten.

184 185 201 195 191 198 187

On your Own:

Now it's time to practice rounding three-digit numbers to the nearest ten on your own!



Name: ______________________ G3 L2.10 Independent Work

1. Round 195 to the nearest ten.	2. Round 612 to the nearest ten.
3. Round 905 to the nearest ten.	4. Round 534 to the nearest ten.

Name: ______________________________________

Round the following number to the nearest ten.

672 ←——————————→ _____ _____ Answer: ________	**104** ←——————————→ _____ _____ Answer: ________
355 ←——————————→ _____ _____ Answer: ________	**215** ←——————————→ _____ _____ Answer: ________
129 ←——————————→ _____ _____ Answer: ________	**143** ←——————————→ _____ _____ Answer: ________

Circle all of the numbers that round to 190 when rounding to the nearest ten.

184 185 201 195 191 198 187

A local ice cream stand usually sells about 697 ice creams a day in the summer. Rounding to the nearest ten, about how many ice cream cones do they sell a day?

I am thinking of a secret number. When rounded to the nearest hundred the answer is 200. When rounded to the nearest ten the answer is 250. What number could I be thinking of?

Sani has 194 gummy bears. She said she has about 200 gummy bears. Did Sani round to the nearest ten or hundred? How do you know?

Name: ______________________________________ G3 U2 Lesson 10 - Independent Work

1. Round 195 to the nearest ten. _____ _____ Answer: ___________	2. Round 612 to the nearest ten. _____ _____ Answer: ___________
3. Round 905 to the nearest ten. _____ _____ Answer: ___________	4. Round 534 to the nearest ten. _____ _____ Answer: ___________

Select all of the numbers that round to 120 when rounding to the nearest ten.

- ☐ 123
- ☐ 105
- ☐ 115
- ☐ 127
- ☐ 112
- ☐ 114
- ☐ 122

Name: ______________________________ G3 U2 Lesson 10 - Let's Try It

Round the following number to the nearest ten.

1. 672

672

670 675 680

2. 104

104

100 105 110

3. 355

355

350 355 360

4. 215

215

210 215 220

5. 129

129

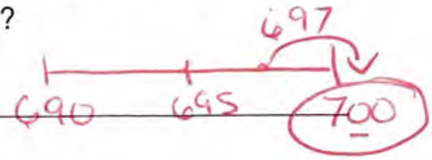
120 125 130

6. 943

943

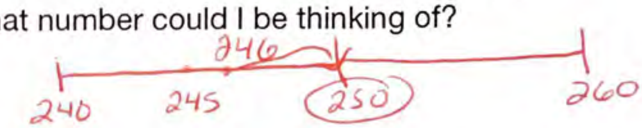
940 945 950

7. A local ice cream stand usually sells about 697 ice creams a day in the summer. Rounding to the nearest ten, about how many ice cream cones do they sell a day?



They sell about 700 ice cream cones.

8. I am thinking of a secret number. When rounded to the nearest hundred the answer is 200. When rounded to the nearest the answer is 250. What number could I be thinking of?

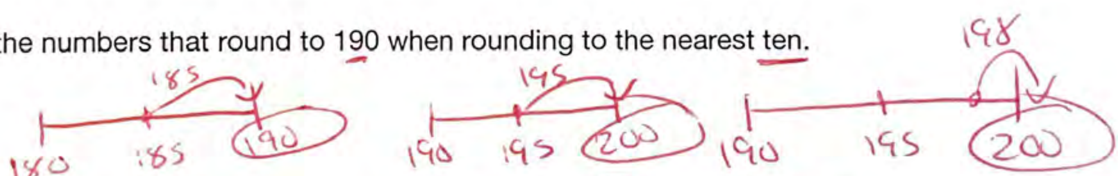


The answer could be 246.

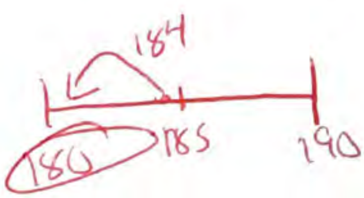
9. Sani has 194 gummy bears. She said she has about 200 gummy bears. Did Sani round to the nearest ten or hundred.

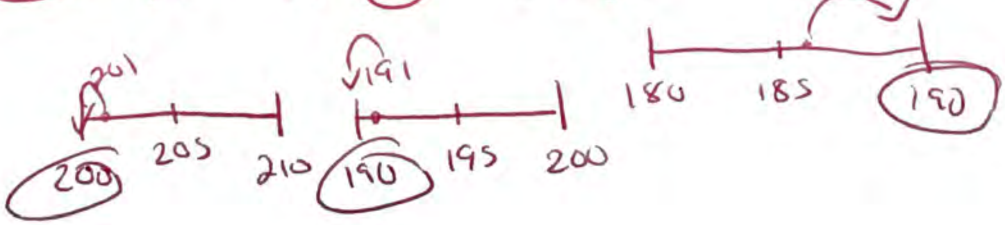
Sani rounded to the nearest hundred. If she rounded to the nearest ten, her answer would have been 190.

10. Circle all of the numbers that round to 190 when rounding to the nearest ten.



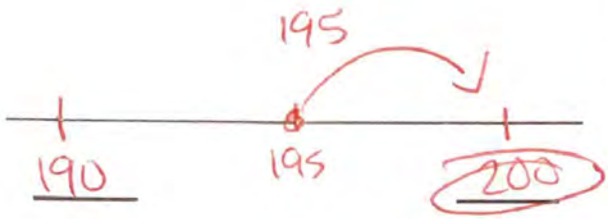
~~184~~ 185 ~~201~~ ~~195~~ 191 198 187



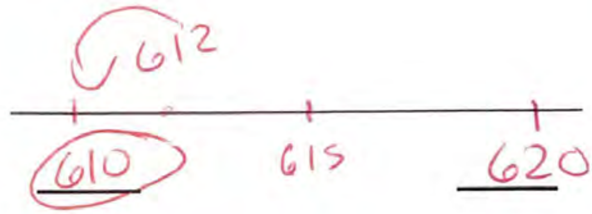


Name: ______________________________ G3 U2 Lesson 10 - On Your Own

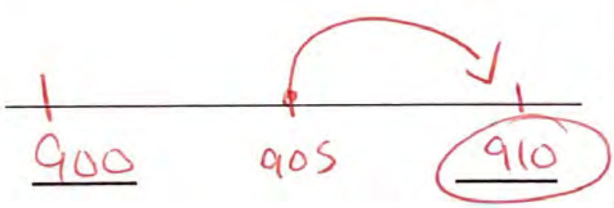
1. Round 195 to the nearest ten.



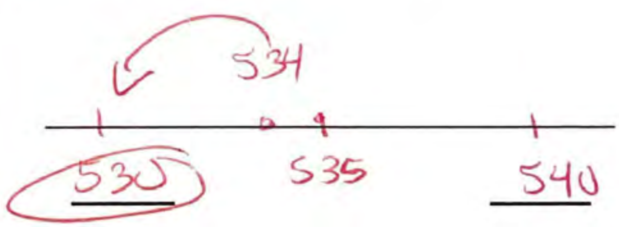
2. Round 612 to the nearest ten.



3. Round 905 to the nearest ten.



4. Round 534 to the nearest ten.



G3 U2 Lesson 11

Students will estimate sums by rounding and apply them to solving word problems

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G3 U2 Lesson 11- Students will estimate sums by rounding and apply to solving word problems

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 3): Today we will use what we know about place value to estimate sums by rounding. That means we can use rounding to help us add. An estimation is a close guess. When you estimate you are getting *about* the right answer or *close* to the right answer. So, today we will use what we have learned about rounding to the nearest tens and hundreds as we add.

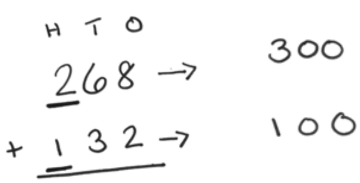
Let's Talk (Slide 4): We've been practicing A LOT of rounding. How could rounding help us in real life?
Possible Student Answers, Key Points:

- It can help us if we're buying something and we want to know *about* how much something costs
- It can help us check if our answer is right
- If we are at the grocery store, we can make a guess for how much something will cost

Let's Think (Slide 5): Exactly, in life estimating is sometimes very helpful. Often we will not get out a pen and paper, we will try to get close to the exact amount like in the grocery store or even cooking something.
We do have to think carefully about how we are rounding. Today we will solve word problems where we are estimating sums. We will need to pay careful attention to what place we are rounding too. Let me show you what I mean.

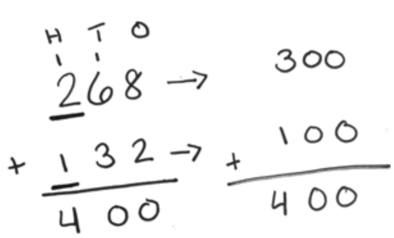
This says, "Let's estimate the sum of 268 + 132 by rounding to the greatest place value." I see the word *estimate*, which means to round. For example if there are 268 blue crayons and 132 red crayons and we want to say *about* how many crayons there are, we can round and then add to get an estimate.

Now, whenever we estimate sums, we want to make sure we round before adding, in other words round 268 and then round 132 and then add them together to get our estimate. This question is asking us to round to the greatest place value. Well, what is the greatest place in a three-digit number? The hundreds place! Right, we should be estimating or rounding to the nearest hundreds place.



Let's begin by lining up and stacking the two numbers that we're adding. Then, let's think about the first addend, 268. We want to round 268 to the nearest hundred and we know it's between 200 and 300, so is 268 closer to 200 or 300? 300! That's right! When we round 268 to the nearest hundred, it's 300. Now, let's think about the second addend, 132. We know that 132 is between 100 and 200. If we round it to the nearest hundred, does it round down to 100 or up to 200? 100! That's right, 132 rounded to the nearest hundred is 100!

Note: If students still need to round using number lines, they should! If they have gotten fluent with rounding, they can do it in their head.



So, 268 is *about* 300 and 132 is *about* 100, so 268 and 132 is *about* 400. So our estimate, or close guess is 400.

But, we can also find the EXACT answer. Let's solve the exact sum to double check my estimate (*invite students to solve on whiteboards/paper*). Wow, we got the exact same answer. In this case it means that rounding to the nearest hundred was a close estimate!

Let's Think (Slide 6): Let's look at another example together. This says, "On Friday, there were 39 students in the cafeteria eating school lunch and 24 students eating lunch from home. Rounding to the nearest ten, *about* how many students were eating in the cafeteria in all?"

Well, we know that whenever we solve a story problem, it is important that I stop and take time to understand what we just read. We just read that some students were eating lunches from school and some students were eating lunches from home. It is our job to figure out ***about*** how many students were in the cafeteria in all, that means we'll count the students who ate school lunch AND the students who brought lunch from home. The word ***about*** in a story problem is a signal to estimate or round. In order to solve this problem, we need to estimate to find the sum.

T O
39 → 40
+ 24 → 20

So just like in the first problem, let's stack the addends by place value to make sure we're combining hundreds with hundreds, tens with tens and ones with ones. Then, let's round each addend to the nearest ten. Don't forget if we need to use number lines to round, that's fine!

So, what is 39 rounded to the nearest ten? 40! And, what is 24 rounded to the nearest ten? 20! So there were about 40 students eating school lunch and about 20 students eating lunch from home. Well, 40 and 20 is 60, so that means there were about 60 students in the cafeteria. Let's also solve to find the *exact* amount of students in the cafeteria (*invite students to solve on whiteboards/paper*).

Nice work, when we added the exact amount, we got 63. And, when we rounded for an estimate we got 60. Both answers are pretty close to one another!

Let's Try it (Slides 7): Now let's work on estimating sums by rounding, together. We are going to work on this page, together step by step. Remember, using a number line and the halfway point can help us to round!

WARM WELCOME

(Tutors should adjust this slide for individual opening routine)

Today we will estimate sums by rounding and apply to solving word problems.

Let's Review:

"estimate"

"about"

"round"

Let's Talk:

When can rounding be helpful in real life?

Let's Think:

Let's estimate the sum of 268 + 132 by rounding to the greatest place value.

Let's Think:

On Friday, there were 39 students in the cafeteria eating school lunch and 24 students eating lunch from home. Rounding to the nearest ten, about how how many students were eating in the cafeteria in all?

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Let's Try It:

Let's practice estimating sums by rounding, together!

G3 L2.11

Let's Try It: Name: ___________________________

Estimate the sum by rounding to the nearest hundred.

1. 547 + 355 = ________

2. 289 + 605 = ________

Estimate the sum by rounding to the nearest ten.

3. 547 + 355 = ________

4. 289 + 605 = ________

G3 L2.11

5. Kori needed 347 chocolate chips and 551 white chocolate chips for her cookie recipe. Rounded to the greatest place value, about how many chips does Kori need to complete her recipe?

6. The chart below shows the distance the track team raced at the last track meet.

Runner 1	15 miles
Runner 2	38 miles
Runner 3	45 miles

Rounded to the nearest ten, how many miles did the track team run in all?

7. Jenni and Oscar were having a paper airplane competition. Jenni threw her paper airplane 324 meters. Oscar threw his paper airplane 487 meters. Rounded to the nearest ten, about how many meters did Jenni and Oscar throw theri paper airplanes in all?

On your Own:

Now it's time to practice estimating sums by rounding on your own!

Name: ___________________________ G3 L2.11 Independent Work

1. Rounded to the greatest place value: solve 725 + 252 = ________

2. Third grade was creating paintings for the art show. One homeroom created 37 paintings. The other homeroom created 98 paintings. Rounded to the nearest ten about how many paintings did third grade create for the art show?

3. A family was hiking through a state park. They hiked 769 meters on the blue trail and 103 meters on the yellow trail. Rounded to the greatest place value, about how many miles did the family hike>

4. Jocelyn was determined to become an experienced guitar player. She practiced 65 hours on Tuesday, 72 hours on Wednesday and 86 hours on Thursday. Rounded to the nearest ten, about how many hours did Jocelyn practice this week?

Name: ____

Estimate the sum by rounding to the nearest **hundred.**

1. 547 + 355 = __________
2. 289 + 605 =___________

Estimate the sum by rounding to the nearest **ten.**

3. 547 + 355 = __________
4. 289 + 605 =___________

Kori needed 347 chocolate chips and 551 white chocolate chips for her cookie recipe. Rounded to the greatest place value, about how many chips does Kori need to complete her recipe?

The chart below shows the distance the track team raced at the last track meet.

Runner 1	15 miles
Runner 2	38 miles
Runner 3	45 miles

Rounded to the nearest ten, how many miles did the track team run in all?

Jenni and Oscar were having a paper airplane competition. Jenni threw her paper airplane 324 meters. Oscar threw his paper airplane 487 meters. Rounded to the nearest ten, about how many meters did Jenni and Oscar throw theri paper airplanes in all?

Name: ____ G3 U2 Lesson 11 - Independent Work

1. Rounded to the greatest place value: solve
   725 + 252 = __________

2. Third grade was creating paintings for the art show. One homeroom created 37 paintings. The other homeroom created 98 paintings. Rounded to the nearest ten about how many paintings did third grade create for the art show?

3. A family was hiking through a state park. They hiked 769 meters on the blue trail and 103 meters on the yellow trail. Rounded to the greatest place value, about how many miles did the family hike>

4. Jocelyn was determined to become an experienced guitar player. She practiced 65 hours on Tuesday, 72 hours on Wednesday and 86 hours on Thursday. Rounded to the nearest ten, about how many hours did Jocelyn practice this week?

Name: ______________________________ G3 U2 Lesson 11 - Let's Try It

Estimate the sum by rounding to the nearest hundred.

1. 547 + 355 = __________

547 → 500 550 600 → 500
+ 355 → 300 350 400 → 400
902 + 900

2. 289 + 605 = __________

289 → 200 250 300 → 300
+ 605 → 600 650 700 → + 600
894 900

Estimate the sum by rounding to the nearest ten.

3. 547 + 355 = __________

547 → 540 545 550 → 550
+ 355 → 350 355 360 → + 360
902 910

4. 289 + 605 = __________

289 → 280 285 290 → 290
605 → 600 605 610 → + 610
894 900

5. Kori needed 347 chocolate chips and 551 white chocolate chips for her cookie recipe. Rounded to the greatest place value, about how many chips does Kori need to complete her recipe?

Kori needs about 900 chips.

347 → 300 350 400

551 → 500 550 600

$$\begin{array}{r} 347 \\ +\ 551 \\ \hline 898 \end{array} \qquad \begin{array}{r} 300 \\ +\ 600 \\ \hline 900 \end{array}$$

6. The chart below shows the distance the track team raced at the last track meet.

Runner 1	15 miles
Runner 2	38 miles
Runner 3	45 miles

15 → 10 15 20

38 → 30 35 40

45 → 40 45 50

$$\begin{array}{r} 20 \\ 40 \\ 50 \\ \hline 110 \end{array}$$

Rounded to the nearest ten, how many miles did the track team run in all?

The track team ran about 110 miles.

7. Jenni and Oscar were having a paper airplane competition. Jenni threw her paper airplane 324 meters. Oscar threw his paper airplane 487 meters. Rounded to the nearest ten, about how many meters did Jenni and Oscar throw theri paper airplanes in all?

They threw their airplanes about 810 meters.

324 → 320 325 330

487 → 480 485 490

$$\begin{array}{r} 324 \\ +\ 487 \\ \hline 811 \end{array} \qquad \begin{array}{r} 320 \\ +\ 490 \\ \hline 810 \end{array}$$

1. Rounded to the greatest place value: solve 725 + 252 = __________

725 → 700

+ 252 → 400

1077

700 750 800

300 350 400

1100

2. Third grade was creating paintings for the art show. One homeroom created 37 paintings. The other homeroom created 98 paintings. Rounded to the nearest ten about how many paintings did third grade create for the art show?

T O

37 → 40

+ 98 → 100

135

30 35 40

90 95 100

140

Third grade created about 140 paintings.

3. A family was hiking through a state park. They hiked 769 meters on the blue trail and 103 meters on the yellow trail. Rounded to the greatest place value, about how many miles did the family hike>

769 → 800

+ 103 → 100

700 750 800

100 150 200

900

The family hiked about 900 miles.

4. Jocelyn was determined to become an experienced guitar player. She practiced 65 hours on Tuesday, 72 hours on Wednesday and 86 hours on Thursday. Rounded to the nearest ten, about how many hours did Jocelyn practice this week?

65 → 70

72 → 70

+ 86 → 90

60 65 70

70 75 80

80 85 90

230

Jocelyn practiced about 230 hours this week.

G3 U2 Lesson 12

Students will estimate differences by rounding and apply them to solving word problem

G3 U2 Lesson 12- Students will estimate differences by rounding and apply to solving word problems

Warm Welcome (Slide 1): Tutor choice

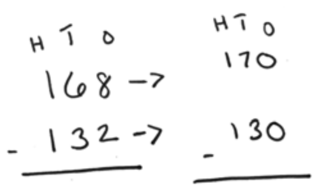
Frame the Learning/Connect to Prior Learning (Slide 3): Today we will use what we know about place value to estimate differences by rounding. That means we can use rounding to help us subtract. An estimation is a close guess. When you estimate you are getting about the right answer or close to the right answer. So, today we will use what we have learned about rounding to the nearest tens and hundreds as we subtract.

Let's Talk (Slide 4): Janelle went grocery shopping to buy ingredients for dinner. She took $200 to the store with her. She spent $103. Janelle needed to make sure she knew how much change to receive but she didn't have a pen and paper. How could Janelle solve her problem? Possible Student Answers, Key Points

- She could round to the nearest tens place or hundreds place to see how much she spent.
- She could round to the nearest hundred and subtract. Then she could take three extra dollars away to find the exact amount.
- She had 200 and she spent *about* 100 so she should get *about* 100 back in change.

Let's Think (Slide 5): Exactly! Janelle can make a close guess to help her figure out how much money she should get back. In life estimating is sometimes very helpful especially when measuring or purchasing enough of something. Just like we did yesterday, today we'll use rounding to help us but instead of adding, we'll be subtracting.

This problem says, "Estimate to find the difference of 168 - 132 by rounding to the nearest ten." I see the word ESTIMATE, which means to round. This problem is asking us to round to the nearest tens. Whenever we estimate differences, we want to make sure we round before subtracting.

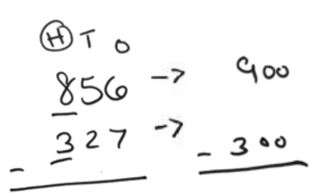


Let's start by stacking our two numbers. So, we want to know about how much 168 minus 132 is. Let's start with the whole amount, 168. Remember, we're rounding to the nearest ten. So, 168 is between 160 and 170. It's closer to 170 so it's *about* 170. And, 132 is between 130 and 140. What is 132 rounded to the nearest ten? 130! Right. So, 132 is *about* 130.

Remember, if we need to use a number line to help us subtract, we should draw it out and make the halfway point!

Now, these rounded numbers are easy to work with! So 170 -130 is 40. So, 168 - 132 is *about* 40. Let's work together to find the *exact* answer (*invite students to subtract on whiteboards/paper*). When we subtract using our algorithm, we get 36. And, 36 is close to 40 so our estimate was close!

Let's Think (Slide 6): Let's try another problem. Read it with me, "There were 856 seats in the movie theater. Third grade went to see The Little Mermaid and used 327 seats. Rounded to the greatest place value, about how many seats were unused in the movie theater?"



So, we want to find an estimate, or close guess, of how many seats will not be used by third grade in the movie theater. So just like in the first problem, let's stack the numbers by place value. Then let's round each number to the nearest hundred because the problem said the greatest place value. So, 856 is between 800 and 900, and which hundred does it round to? 900! And, 327 is between 300 and 400. And, which hundred does it round to? 300!

So, there were *about* 900 seats and third graders used *about* 300 of the seats. That means that there are *about* 600 seats that are unused. Let's also subtract to find the exact amount of unused seats.   When we find the exact amount, it's 529 unused seats.

Let's Try it (Slides 7): Now let's work on estimating differences by rounding, together. We are going to work on this page, together step by step. Remember, using a number line and the halfway point will help us to round!

WARM WELCOME

(Tutors should adjust this slide for individual opening routine)

Today we will estimate differences by rounding and apply to solving word problems.

Let's Review:

estimate/ about/ round

Let's Talk:

Janelle went grocery shopping to buy ingredients for dinner. She took $200 to the store with her. She spent $ 103. Janelle needed to make sure she knew how much change to receive but she didn't have a pen and paper. How could Janelle solve her problem?

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Let's Think:

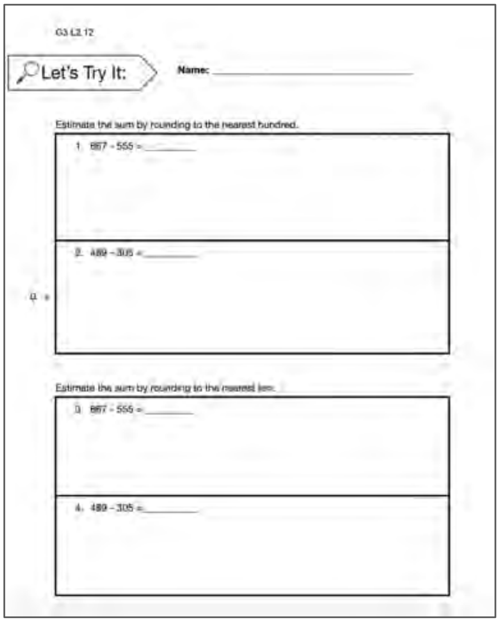
Estimate to find the difference of 168 - 132 by rounding to the nearest ten.

Let's Think:

There were 856 seats in a movie theater. Third grade went to see the The Little Mermaid and used 327 seats. Rounded to the greatest place value, about how many seats were unused in the movie theater?

Let's Try It:

Let's practice estimating differences by rounding, together!



G3 L2 12

Let's Try It: Name: ____________________

Estimate the sum by rounding to the nearest hundred.

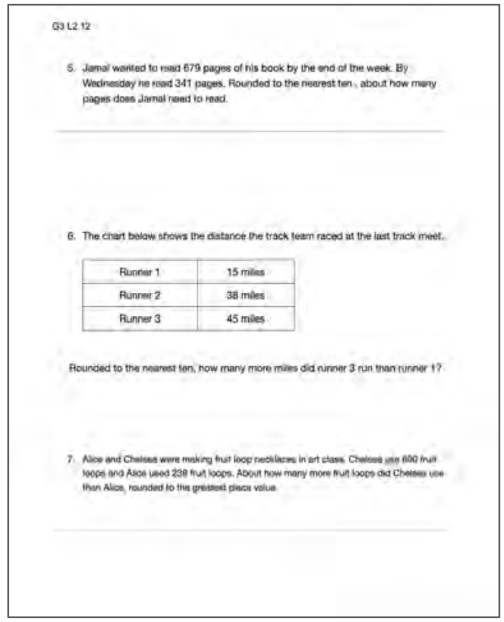
1. 867 - 555 = ________

2. 489 - 305 = ________

Estimate the sum by rounding to the nearest ten.

3. 867 - 555 = ________

4. 489 - 305 = ________



G3 L2 12

5. Jamal wanted to read 679 pages of his book by the end of the week. By Wednesday he read 341 pages. Rounded to the nearest ten , about how many pages does Jamal need to read.

6. The chart below shows the distance the track team raced at the last track meet.

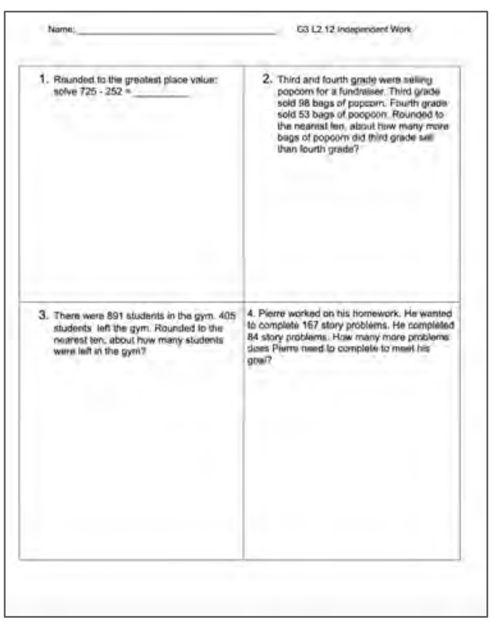
Runner 1	15 miles
Runner 2	38 miles
Runner 3	45 miles

Rounded to the nearest ten, how many more miles did runner 3 run than runner 1?

7. Alice and Chelsea were making fruit loop necklaces in art class. Chelsea use 600 fruit loops and Alice used 238 fruit loops. About how many more fruit loops did Chelsea use than Alice, rounded to the greatest place value.

On your Own:

Now it's time to practice estimating differences by rounding on your own!



Name: ____________________ G3 L2 12 Independent Work

1. Rounded to the greatest place value: solve 725 - 252 = ________

2. Third and fourth grade were selling popcorn for a fundraiser. Third grade sold 98 bags of popcorn. Fourth grade sold 53 bags of poopcorn. Rounded to the nearest ten, about how many more bags of popcorn did third grade sell than fourth grade?

3. There were 891 students in the gym. 405 students left the gym. Rounded to the nearest ten, about how many students were left in the gym?

4. Pierre worked on his homework. He wanted to complete 167 story problems. He completed 84 story problems. How many more problems does Pierre need to complete to meet his goal?

Name: ____

Estimate the difference by rounding to the nearest **hundred.**

1. 867 - 555 = __________
2. 489 - 305 =___________

Estimate the difference by rounding to the nearest **ten.**

3. 867 - 555 = __________
4. 489 - 305 =___________

Jamal wanted to read 679 pages of his book by the end of the week. By Wednesday he read 341 pages. Rounded to the nearest ten , about how many pages does Jamal need to read.

The chart below shows the distance the track team raced at the last track meet.

Runner 1	15 miles
Runner 2	38 miles
Runner 3	45 miles

Rounded to the nearest ten, how many more miles did runner 3 run than runner 1?

Alice and Chelsea were making fruit loop necklaces in art class. Chelsea use 690 fruit loops and Alice used 239 fruit loops. About how many more fruit loops did Chelsea use than Alice, rounded to the greatest place value.

Name: ____ G3 U2 Lesson 12 - Independent Work

1. Rounded to the greatest place value: solve 725 - 252 = __________	2. Third and fourth grade were selling popcorn for a fundraiser. Third grade sold 98 bags of popcorn. Fourth grade sold 53 bags of poopcon. Rounded to the nearest ten, about how many more bags of popcorn did third grade sell than fourth grade?
3. There were 891 students in the gym. 405 students left the gym. Rounded to the nearest ten, about how many students were left in the gym?	4. Pierre worked on his homework. He wanted to complete 167 story problems. He completed 84 story problems. How many more problems does Pierre need to complete to meet his goal?

Name: ______________________________________ G3 U2 Lesson 12 - Let's Try It

Estimate the sum by rounding to the nearest hundred.

1. 867 - 555 = __________

H T O

867 → 800 850 900 (867)

− 555 → 500 550 600 (555)

312

900
− 600
300

2. 489 - 305 =__________

489 → 400 450 500 (489)

− 305 → 300 350 400 (305)

184

500
− 300
200

Estimate the sum by rounding to the nearest ten.

3. 867 - 555 = __________

867 → 860 865 870 (867)

− 555 → 550 555 560 (555)

870
− 560
310

4. 489 - 305 =__________

489 → 480 485 490 (489)

− 305 → 300 305 310 (305)

490
− 310
180

5. Jamal wanted to read 679 pages of his book by the end of the week. By Wednesday he read 341 pages. Rounded to the nearest ten , about how many pages does Jamal need to read.

Jamal needs to read about 340 pages.

679 → 670 675 680

− 341 → 340 345 350

680
− 340
340

6. The chart below shows the distance the track team raced at the last track meet.

Runner 1	15 miles
Runner 2	38 miles
Runner 3	45 miles

45 → 40 45 50

− 15 → 10 15 20

50
− 20
30

Rounded to the nearest ten, how many more miles did runner 3 run than runner 1?

Runner 3 ran about 30 more miles.

7. Alice and Chelsea were making fruit loop necklaces in art class. Chelsea use 690 fruit loops and Alice used 239 fruit loops. About how many more fruit loops did Chelsea use than Alice, rounded to the greatest place value.

Chelsea used about 500 more fruit loops.

690 → 600 650 700

− 239 → 200 350 300

700
− 200
500

Name: ______________________________ G3 U2 Lesson 12 - On Your Own

1. Rounded to the greatest place value: solve 725 - 252 = __________

725 → 700 750 800

-252 → 200 250 300

700
- 300
400

2. Third and fourth grade were selling popcorn for a fundraiser. Third grade sold 98 bags of popcorn. Fourth grade sold 53 bags of poopcon. Rounded to the nearest ten, about how many more bags of popcorn did third grade sell than fourth grade?

98 → 90 95 100

-53 → 50 55 60

100
- 50
50

Third grade sold about 50 more bags.

3. There were 891 students in the gym. 405 students left the gym. Rounded to the nearest ten, about how many students were left in the gym?

891 → 890 895 900

-405 → 400 405 410

890
410
480

About 480 students were left in the gym.

4. Pierre worked on his homework. He wanted to complete 167 story problems. He completed 84 story problems. How many more problems does Pierre need to complete to meet his goal?

167
- 84
83

Pierre needs to complete 83 more problems

CITYTUTOR DC

G3 Unit 3:

Finding Area

G3 U3 Lesson 1

Explore the area of rectangles using square tiles

CITYTUTOR DC

G3 U3 Lesson 1 - Students will explore the area of rectangles using square tiles and understand area

Materials:

- Cut-able inch and centimeter tiles
    - One set of inch-tiles per student ahead of teaching the lesson
    - Print a copy of inch and centimeter pages to use as grid paper to model rectangles for slide 17
- Optional: ruler for slide 18 so you can draw a square foot.

Warm Welcome (Slide 1): Tutor choice.

Frame the Learning/Connect to Prior Learning (Slide 2): Today we are going to explore the area of rectangles with square tiles. Area is a new term we will learn about. You actually already know a lot about the area of rectangles. First, you have already learned about multiplication. Remember when we multiply we are using *equal groups*. You will do something similar with area measurement. Second, you already learned about arrays, which are rows and columns *(show rows and columns with arms)*. Rows go side to side, columns go up and down. Say it with me, Rows go side to side, columns go up and down! Knowing about arrays will also help you find area today. Let's get started!

Let's Talk (Slide 3): Let's look at these shapes. Take two minutes to turn to the person next to you to discuss which rectangle you think is biggest and I want you to be sure to take time to explain WHY you think that.
Possible Student Answers, Key Points:

- I think A is the biggest because it's the tallest.
- I think B is the biggest because it's the widest.
- I think C is the biggest because it's the longest.
- It's hard to know because we don't know how long each side is.

Those are all great ideas! Some of you think A is biggest because it's tall, others thing B is biggest because it looks wide and others are wondering if maybe C is biggest because it looks really long.

Let's Talk (Slide 4): Well, in order to figure out which rectangle is the biggest, we need to find the area. Let's all say this new word together. I'm going to say it first, AREA! Now you say it, AREA! Area is the amount of space a flat shape, or two-dimensional shape, takes up. Let's say the definition together, area is the amount of space a flat shape, or 2-D shape, takes up.

We can count the area of rectangle A by counting how many square tiles fit INSIDE of the rectangles. Let's count to find the area of rectangle A, let's count all of the square tiles that fit in rectangle A (*count together*). So, the area of Rectangle A is 8 square tiles. Now, let's count Rectangle B (*count together*). So, the area of Rectangle B is 9 square tiles. And finally, let's find the area of Rectangle C (*count together*). So, the area of Rectangle C is 6 square tiles. So, the largest rectangle is Rectangle B because it has the largest area!

Let's Talk (Slide 5):
We just worked together to find the area of three different rectangles. When we measure area, we measure the amount of space a flat, or 2-D shape takes up. Let me show you a few real life examples of area.

- We can find the area of a brick wall in order to figure out how many bricks we'd need to cover a space!
- We can find the area of a flag, or how much fabric we'd need to sew a flag!
- We can find the area of a soccer field!
- We could also find the area of the space around a tree to figure out how many wood chips we'd need to fill that space.

This all has to do with area, or the amount of space a flat shape takes up! Can you think of another example where you might need to know the area? Possible Student Answers, Key Points:

- We can find the area of a carpet.

- We can find the area of a picture or piece of paper.
- We can find the area of a wall.

We keep saying flat shape but the mathematical way to say flat shape is, two-dimensional *(point to the word "two-dimensional" on the slide)*. Let's say the word together, two-dimensional. Two-dimensional, or 2D, means any shape that's flat. You may have heard of 2D and 3D before.

3D, or three-dimensional, is anything that has depth. That means you can look at it from the top, side, or bottom, and it's something you can pick up. For example, a box is three-dimensional. A cupcake is 3-dimensional (*choose examples that are in front of you that you can show them)*. What is something you see in the room that is 3-dimensional? Pencil, desk, lunchbox, water bottle~~!~~

When we find the area, we will be focused on flat shapes, or two-dimensional shapes. In your math class you probably filled in shapes with different shapes like triangles and rhombuses. During this unit we will only focus on squares and rectangles, and shapes that are made out of squares and rectangles. Who can find squares and rectangles in this room?

Let's Think (Slide 6): Now you know what area is. Let's talk about how exactly we find the area of rectangles. In this unit, we're going to learn how to find the area three different ways. Today, we will learn that you can find the area of a rectangle by filling it in with square tiles. It's pretty fun and easy! You take your flat shape, for example this rectangle*,* and you fill it in with tiles one at a time.

Here are some square tiles (*hold up square inch tiles or the cut out tiles*). We will use these square tiles to find the area of flat shapes. What do you notice about these tiles? They are the same size! Yes! When we find the area by tiling a shape, we need to make sure the tiles, or units, are the same size.

- *Note: If you have time, you might want to let the student explore with the tiles for a minute or two and make a design.*

Let's Think (Slide 7): If I'm looking for the area, I have to make sure that all of the tiles are nicely lined up…I can't leave ANY gaps! Hmm, why can't I leave gaps when I'm measuring the area? Then there is still space left that isn't measured! We might have some space that's unaccounted for and the area measurement will be too small. For example, this person who measured this rectangle left space, all of this gray (*point*) that they didn't measure, instead he/she/they would need more than 3 tiles.

Let's Think (Slide 8): If I'm looking for the area, I also have to be very careful not to have any overlaps. How could having overlaps with tiles impact my area measurement? Then you would have too many tiles! The measurement would be wrong. Correct! The tiles need to be next to each other without gaps and overlaps. Otherwise your area measurement won't be accurate. In this example, 6 squares is too many! You might think you need too many squares, or you might end up with too few squares. Imagine if you were buying carpet for the room but when you measured the area of the floor you had gaps! You would have a problem when the carpet came because you wouldn't have enough carpet to cover the whole floor! Listen to me say it first: No Gaps! No overlaps! Now let's say it together: No gaps! No overlaps!

Let's Think (Slide 9): Let's look at this figure, or shape. Here we see what shape? Square/Rectangle! It is a special rectangle that's also a square because all the sides are equal *(trace your finger along the equal sides*). So let's call it a square. We want to know the area. How can we find the area? We can find the area by filling it in with tiles. Yes, we can fill it in with square tiles. But we need to make sure we have no….? No gaps and no overlaps! Watch me tile the rectangle to find the area of this square.

Let's Think (Slide 10): (*If you have the slides printed, tile the square and say, "I am placing one tile at a time with no gaps and no overlaps." Or click the next slide to see tiles filled in, touch one at a time and say, "I placed one tile at a time with no gaps and no overlaps."*) So, how many tiles do you see? 4 tiles! That's right and these tiles are square inches so we can say the area is 4 square inches! Let's say it together, the area is 4 square inches.

Let's Think (Slide 11): Let's look at these two rectangles. What do you notice? Possible Student Answers, Key Points:

- They are both rectangles
- They are both the same color
- They both have 6 squares
- The rectangle on the left is bigger than the other.
- One says square inches, the other says square centimeters.

Nice noticings! You're right, both have an area with 6 square units but the units are different. Units are whatever we are talking about. If we're talking about cookies, our units are cookies. If we're talking about hats, our units are hats. If we're talking about square inches, our units are? Square inches! If we're talking about square centimeters, our units are? Square centimeters! When we talk about area, why is it very important that we include units? If we don't include units, then we won't know how big the tiles need to be.

Let's Think (Slide 12): And, finally let's talk about what would happen if we used square feet instead of square inches or square centimeters? Feet are larger so a square made out of feet would be much bigger. It would be too big for the page! Yes! If you took 1 foot, or a ruler, and made a square, it would be much larger than the squares in these rectangles (*If you have a ruler, show them how large a square foot would be by drawing a square made out of a ruler*). It is so important that we use units so we know how large or small something is. I will make sure you use units when talking about areas and you make sure I use them as well!

Let's Think (Slide 13): Here are some examples of different units you might see when talking about area. Let's read them together. *S*quare units, square inches, square centimeters, square feet, square yards, and many more… Many more means there are other measurement units you can use to measure the area. These are the abbreviations (*point to abbreviations*) so when you're writing, you don't need to write out the whole word. Point to the abbreviations. Why do you think they all have the word square in them? We find the area by counting how many tiles or squares a space takes up. Yes! When we find the area, we are filling in the shape with square units or tiles. So we ALWAYS make sure to include square ______ when talking about area. *(You might want to keep a copy of this slide to the side so students can refer to them as they complete the work.)*

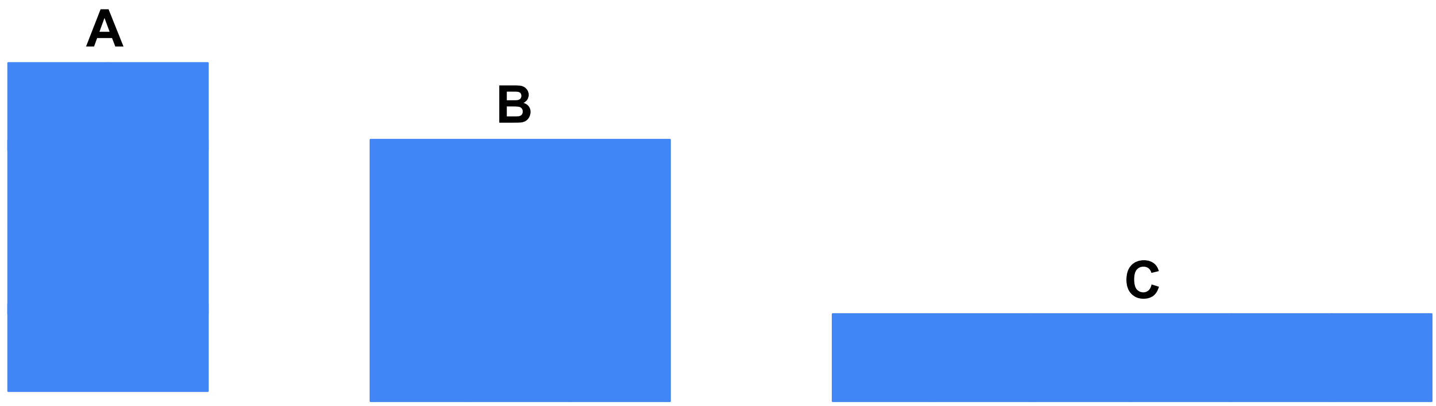
Let's Try it (Slides 14-15): Now let's solve problems about the area of rectangles using tiles. We are going to work on the first page step-by-step. Remember when we are finding the area we are finding what? Area is the amount of space a flat shape takes up. There can be no gaps and no overlaps!

WARM WELCOME

Today we will explore the **area** of rectangles using square tiles.

Let’s Talk:

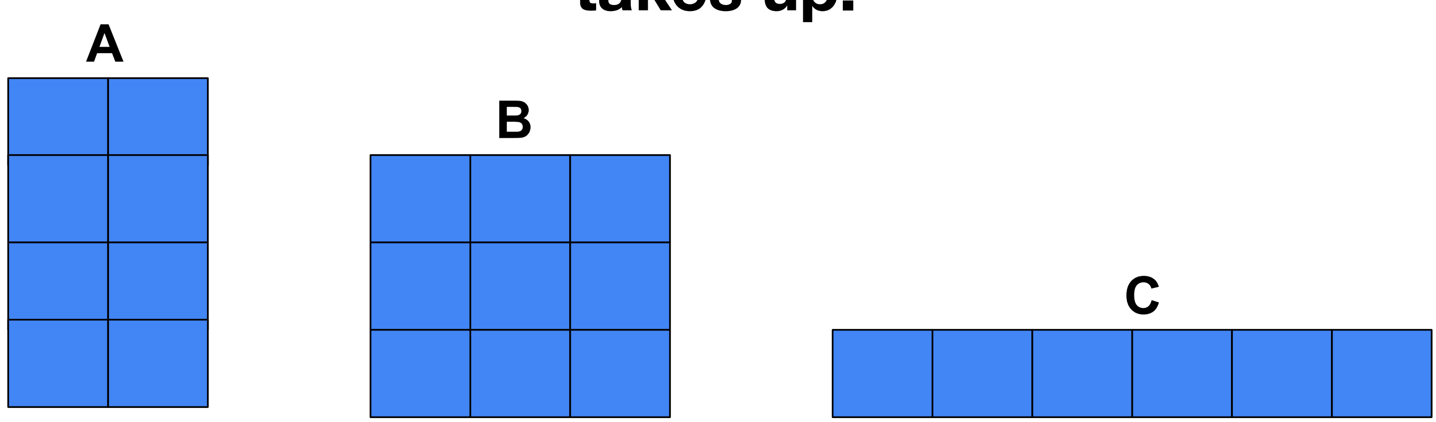
Which shape is the biggest and what makes you think that?



Let’s Talk:

To compare the sizes of these rectangles, we can find their **AREA**!

AREA is the amount of space a flat shape (2-D) takes up.



Let’s Talk:

What is area?

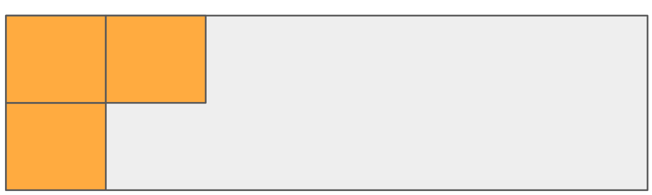
Area is the amount of space a flat shape (two-dimensional shape) takes up.




Let’s Think:

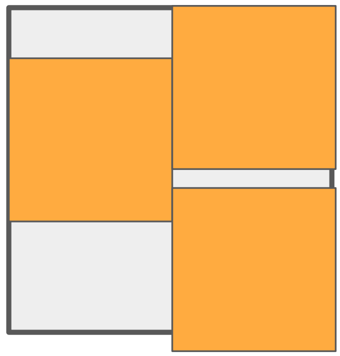
How do you find the area of a rectangle?

You fill in the rectangle with square tiles.



Let's Think:

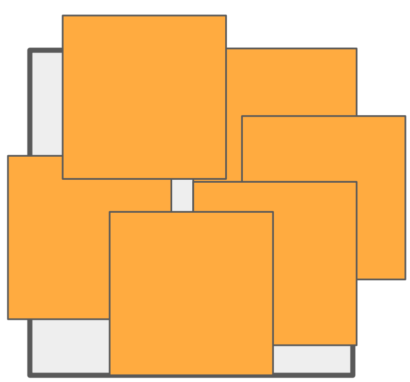
When finding the area, leave <u>no gaps!</u>



area = **3** square inches

Let's Think:

When finding the area, have <u>no overlaps!</u>



area = **6** square inches

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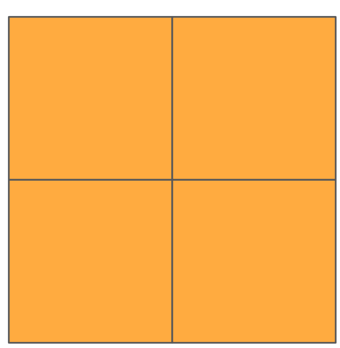
Let's Think:

What is the area of this figure?

area = _____ square inches

Let's Think:

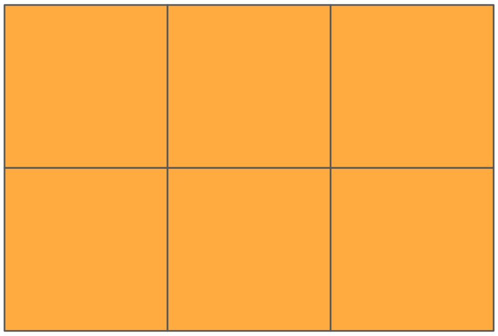
What is the area of this square?

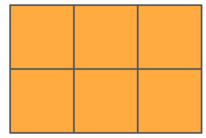


area = _____ square inches

Let's Think:

What do you notice?



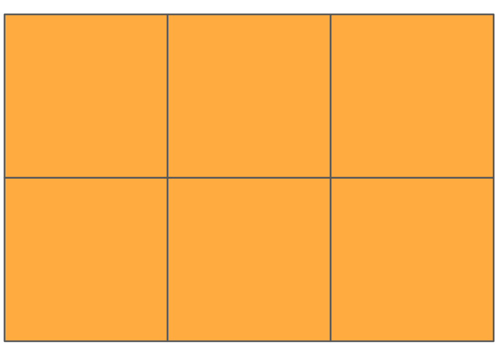


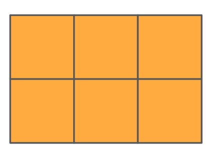
area = 6 square centimeters

area = 6 square inches

Let's Think:

What if you used square feet?
Would 6 square feet be larger or smaller
than the area of these rectangles?





area = 6 square centimeters

area = 6 square inches

Let's Think:

What **units** do we use when finding the area?

square units (sq un)

square inches (sq in)

square centimeters (sq cm)

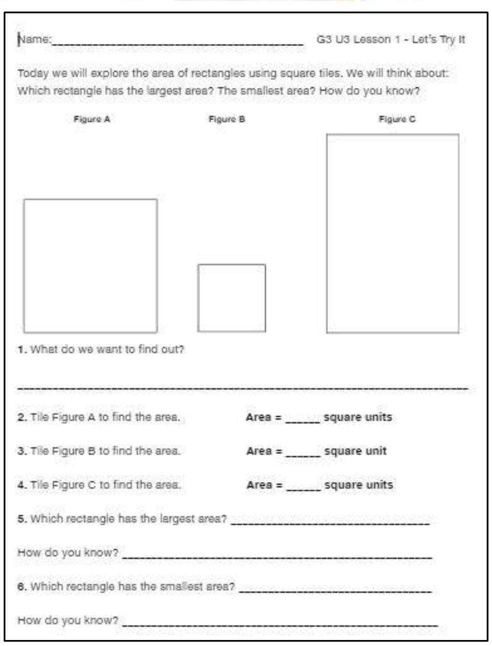
square feet (sq ft)

square yards (sq yd)

and many more…

Let's Try It:

Let's explore finding the area of rectangles using inch tiles together!


Name:________________________ G3 U3 Lesson 1 - Let's Try It

Today we will explore the area of rectangles using square tiles. We will think about: Which rectangle has the largest area? The smallest area? How do you know?

Figure A Figure B Figure C

1. What do we want to find out?

____

2. Tile Figure A to find the area. **Area = _____ square units**

3. Tile Figure B to find the area. **Area = _____ square unit**

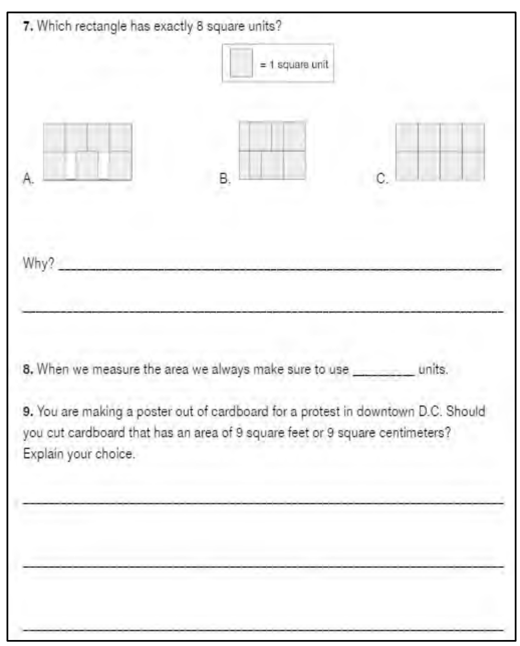
4. Tile Figure C to find the area. **Area = _____ square units**

5. Which rectangle has the largest area? ____________________

How do you know? ____________________

6. Which rectangle has the smallest area? ____________________

How do you know? ____________________


7. Which rectangle has exactly 8 square units?

= 1 square unit

A. B. C.

Why? ____________________

____

8. When we measure the area we always make sure to use ________ units.

9. You are making a poster out of cardboard for a protest in downtown D.C. Should you cut cardboard that has an area of 9 square feet or 9 square centimeters? Explain your choice.

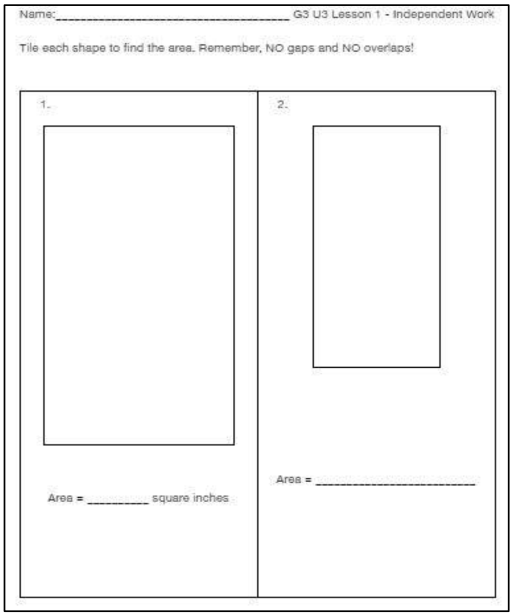
____

____

____

On your Own:

Now you can find the area of rectangles using tiles on your own!


Name:_________________________________ G3 U3 Lesson 1 - Independent Work

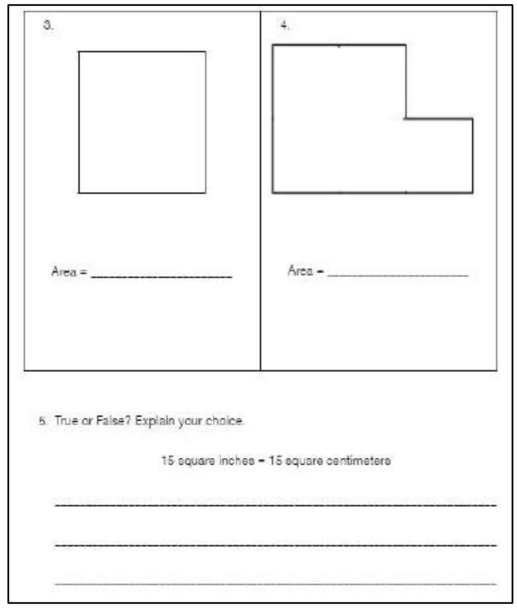
Tile each shape to find the area. Remember, NO gaps and NO overlaps!

1.

Area = ________ square inches

2.

Area = ______________________


3.

Area = ____________________

4.

Area = ____________________

5. True or False? Explain your choice.

15 square inches = 15 square centimeters

____

____

____

Name:______________________________________ G3 U3 Lesson 1 - Let’s Try It

Today we will explore the area of rectangles using square tiles. We will think about: Which rectangle has the largest area? The smallest area? How do you know?

Figure A

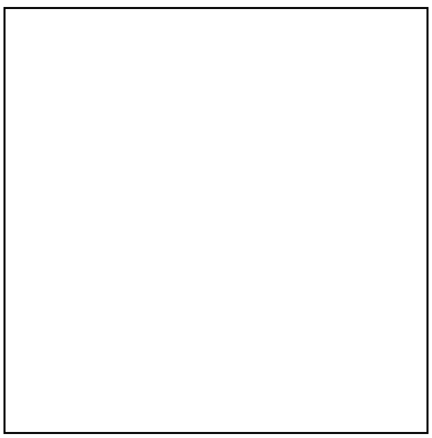


Figure B

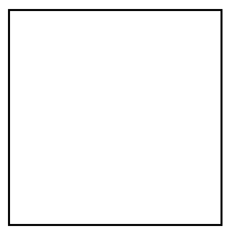
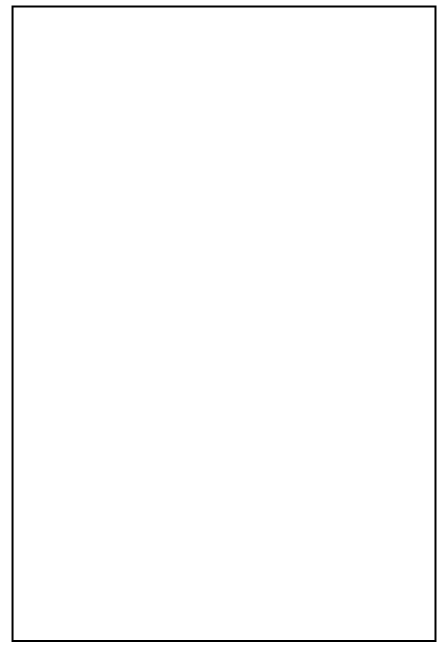


Figure C



1. What do we want to find out?

____

2. Tile Figure A to find the area. **Area = ______ square units**

3. Tile Figure B to find the area. **Area = ______ square unit**

4. Tile Figure C to find the area. **Area = ______ square units**

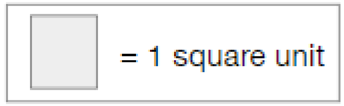
5. Which rectangle has the largest area? __________________________________

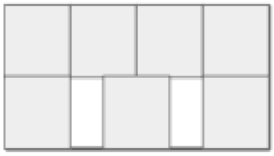
How do you know? ____

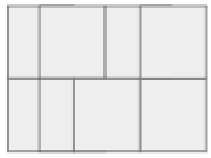
6. Which rectangle has the smallest area? _________________________________

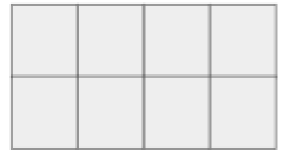
How do you know? ____

7. Which rectangle has exactly 8 square units?



A. 

B. 

C. 

Why? ____

____

8. When we measure the area we always make sure to use _________ units.

9. You are making a poster out of cardboard for a protest in downtown D.C. Should you cut cardboard that has an area of 9 square feet or 9 square centimeters? Explain your choice.

____

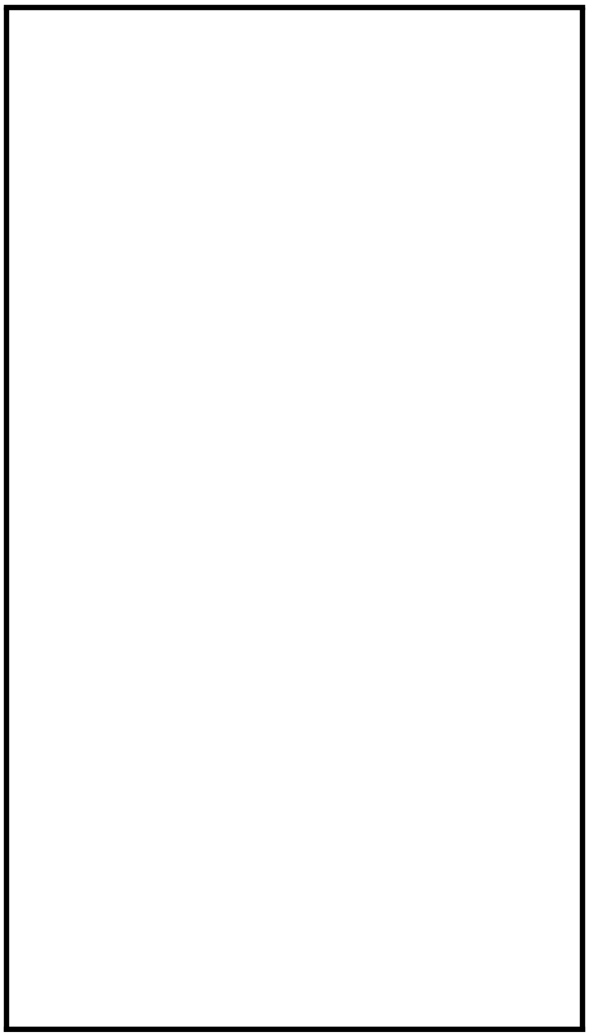
____

____

Name:______________________________ G3 U3 Lesson 1 - Independent Work

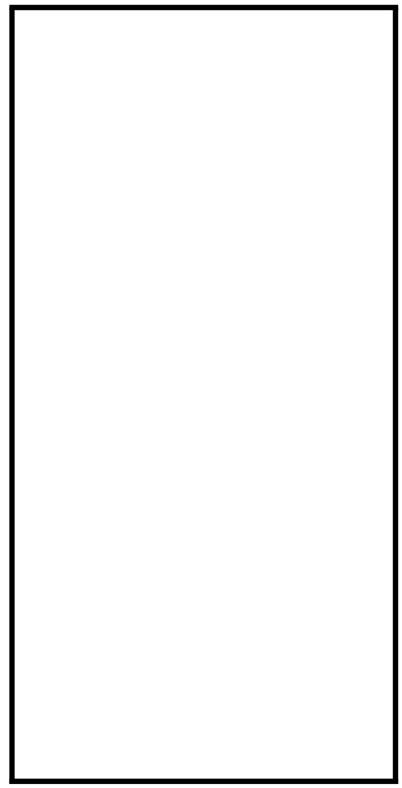
Tile each shape to find the area. Remember, NO gaps and NO overlaps!

1.

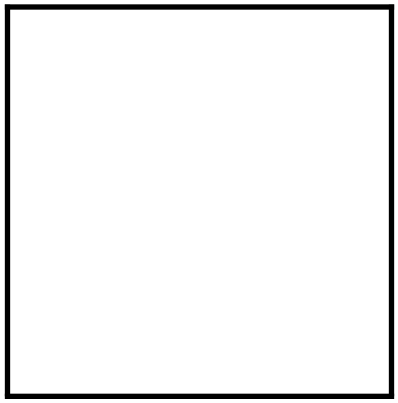
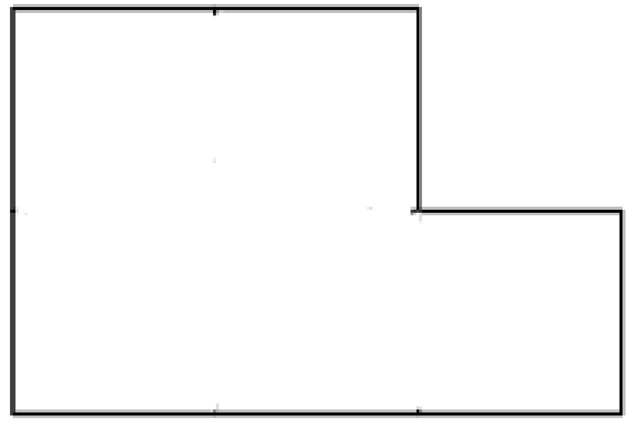


Area = __________ square inches

2.



Area = __________ square inches

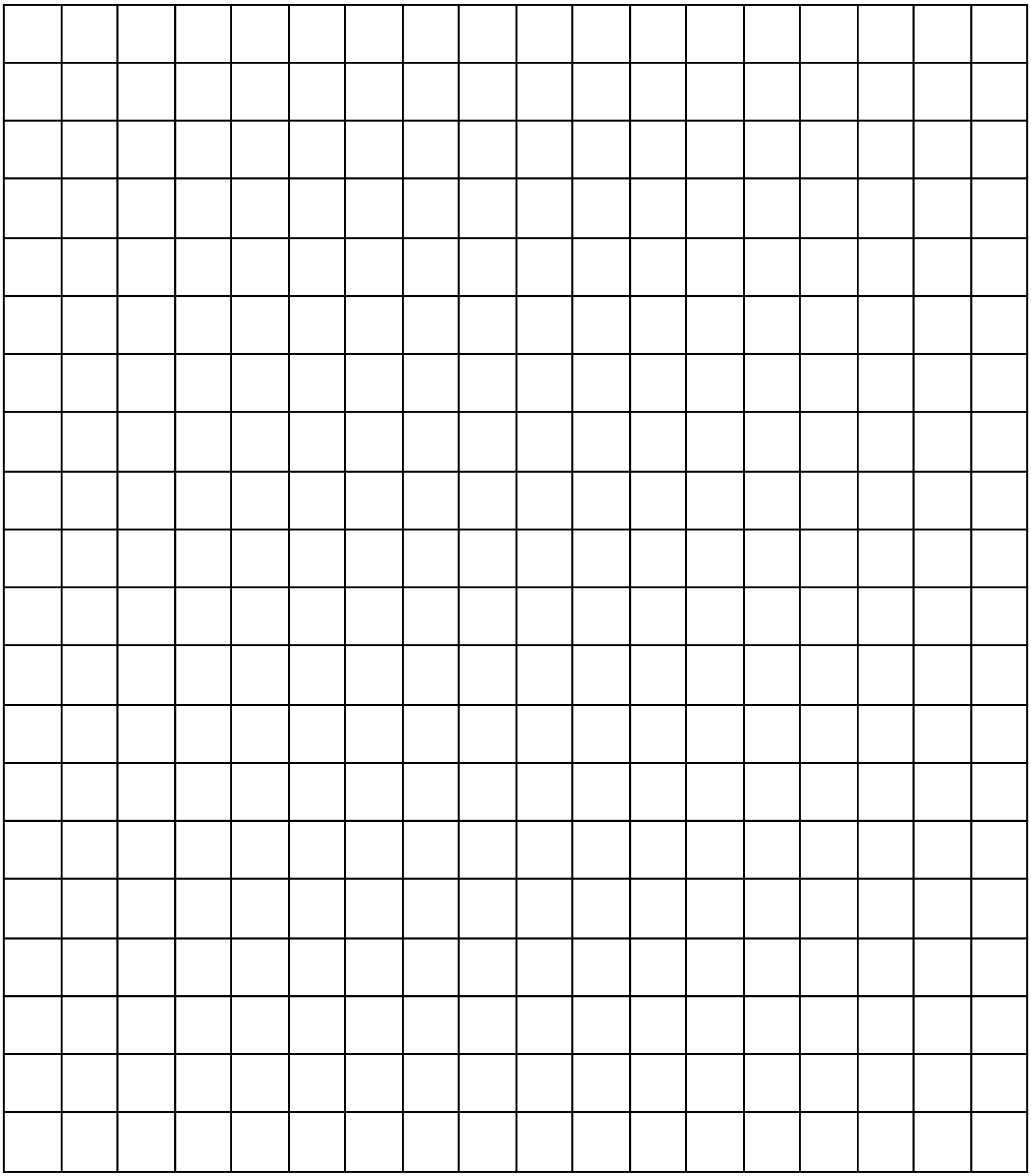
3.	4.
	
Area = __________ square inches	Area = __________ square inches

5. True or False? Explain your choice.

15 square inches = 15 square centimeters

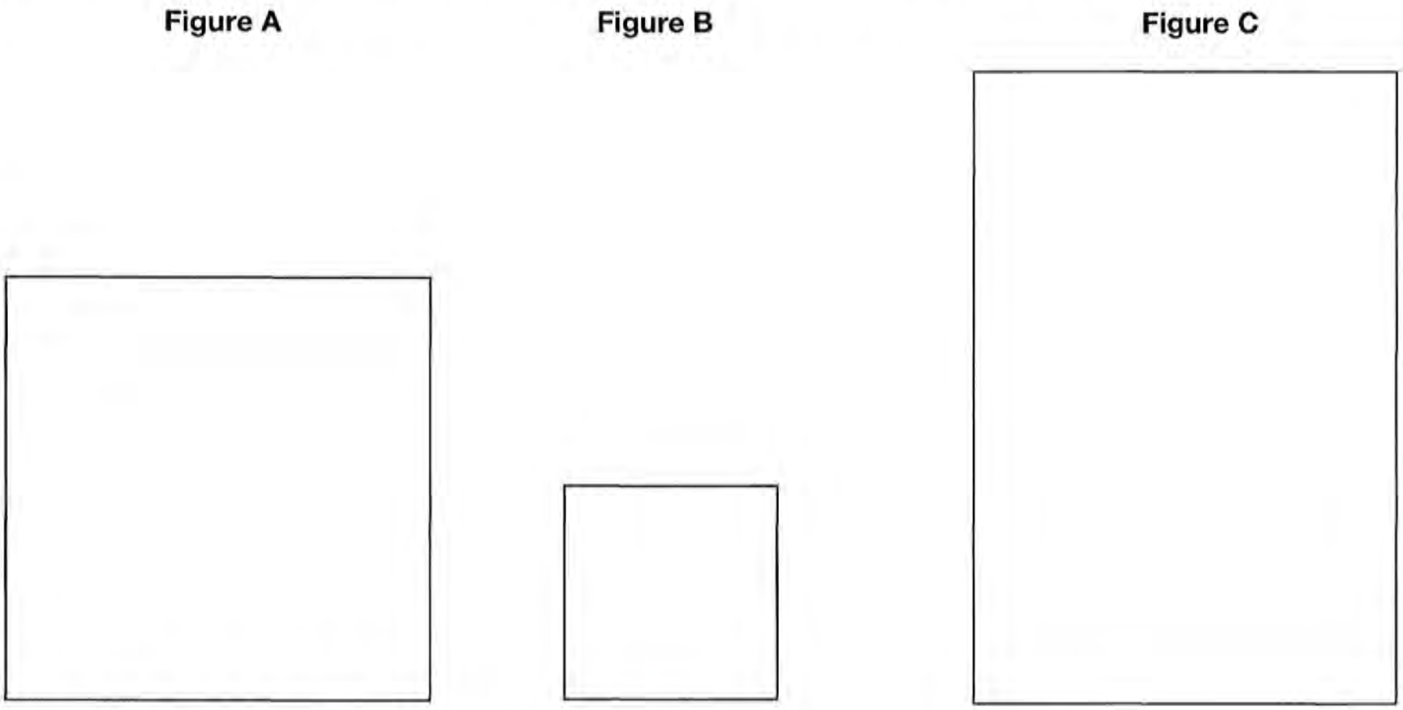
Square Inch Tiles

Square Centimeter Tiles



Name:____________________________ G3 U3 Lesson 1 - Let's Try It

Today we will explore the area of rectangles using square tiles. We will think about: Which rectangle has the largest area? The smallest area? How do you know?



1. What do we want to find out?

Which rectangle has the largest and smallest area.

2. Tile Figure A to find the area. **Area =** 4 **square units**

3. Tile Figure B to find the area. **Area =** 1 **square unit**

4. Tile Figure C to find the area. **Area =** 6 **square units**

5. Which rectangle has the largest area? Figure C

How do you know? 6 is the biggest number.

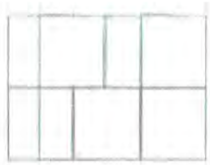
6. Which rectangle has the smallest area? Figure B

How do you know? It only has 1 square

7. Which rectangle has exactly 8 square units?

 = 1 square unit

A. 

B. 

C. 

Why? It is the only rectangle with no gaps and no overlaps.

8. When we measure the area we always make sure to use square units.

9. You are making a poster out of cardboard for a protest in downtown D.C. Should you cut cardboard that has an area of 9 square feet or 9 square centimeters? Explain your choice.

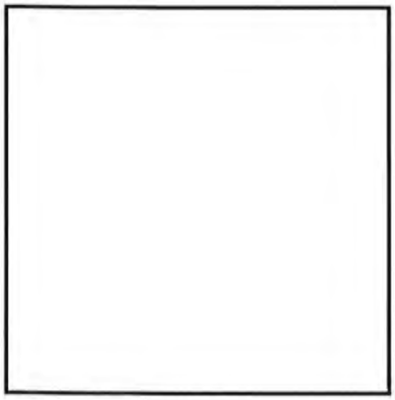
I will cut cardboard that has an area of 9 sq. ft. because 9 square centimeters would be too small.

Name:________________________________ G3 U3 Lesson 1 - Independent Work

Tile each shape to find the area. Remember, NO gaps and NO overlaps!

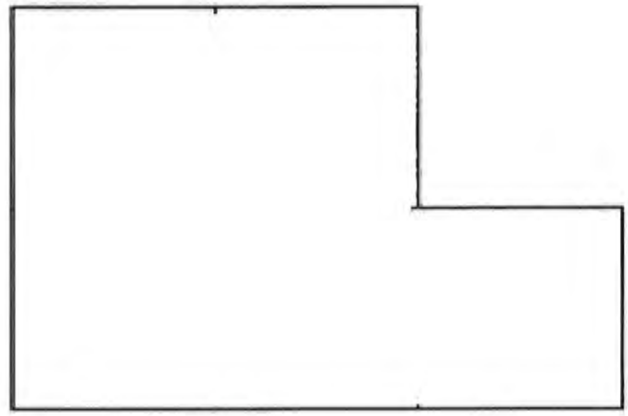
1.	2.
Area = 15 square inches	Area = 8 sq in

3.



Area = 4 sq in

4.



Area = 5 sq in

5. True or False? Explain your choice.

15 square inches = 15 square centimeters

False. Square inches are bigger than square centimeters so they are not equal. They are not the same.

G3 U3 Lesson 2

Measure the area of a rectangle by using equal groups and skip-counting

G3 U3 Lesson 2 - Students will measure the area of a rectangle by using equal groups and skip counting.

Warm Welcome (Slide 1): Tutor choice.

Let's Review (Slide 2): Yesterday we learned about area. So, what is area? Let's say it together! Area is the amount of space a flat shape, or 2-dimensional shape, takes up. And we learned yesterday that one way we can calculate area is to count the square tiles inside of a two-dimensional shape. **What are some examples in your lives of when you or other people might need to find the area?** Possible Student Answers, Key Points:

- The area for your floor if you want to buy carpet. We don't want to order too much or too little.
- The area of a bedroom so I know how much space do I have in a room for a bed?
- How much space a soccer field takes up.
- The area of the playground so we know how much space you have for wood chips.
- How much tile do you need for your classroom floor?
- How much paint do you need to paint the wall or paint a brick wall?

Let's Review (Slide 3): In this unit, we're going to learn how to find the area three different ways. Yesterday we learned the first way. What can you do to find the area? We learned that you can find the area by filling in a two-dimensional shape with square tiles. Remember it must have no gaps and no overlaps to make sure we fill the space completely. So, what is the area of this rectangle? Don't forget to say square units! 12 square units. Yes, the area is 12 square units.

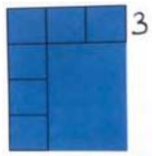
Frame the Learning/Connect to Prior Learning (Slide 4): Today, we will learn the second way to measure the area of rectangles and squares. Today we will explore how we can use what we know about equal groups and skip counting to find area. Today we'll be looking carefully at rows to help us calculate the area more efficiently. Show me rows with your arms (*rows are horizontal)*. Show me columns with your arms (*columns are vertical)*. Rows go side to side. Columns go up and down *clap! clap!* Let's say it together: Rows go side to side. Columns go up and down *clap! clap!* In the next session we will learn the last way to find the area and then you will have 3 different strategies to find the area. Let's get started!

Let's Talk (Slide 5): You just found the area of this rectangle by counting the squares like this (*count by 1s all the way up to 12 in the first rectangle*). You know the area is 12 square units. But look, I notice that when I look at the rows there are equal groups going across, there are 3 (*point to the first row*) and another 3 (*point to the second row*) and another 3 (*point to the third row*) and ANOTHER 3 (*point to the fourth row*). So instead of counting 1, 2, 3…4, 5, 6…7, 8, 9…10, 11, 12. I can count these groups of three by 3. Like this…3, 6, 9, 12 (*point to the rows as you count*).

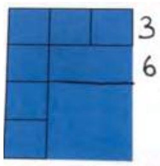
This is important because sometimes you're going to see a rectangle like this! Whoa, look at this rectangle (*point to the second rectangle)*. What is different about it? We can't see all the tiles. Some of the tiles were erased! When we don't have all the tiles filled in so we can't count all the tiles, but counting groups can help us! Just like we skip counted the equal groups in the rectangle on the left, we can do the same thing here.

If I imagine extending these lines for the rows and columns (*drag finger across*), I can see 3 and 3 and 3 and 3, just like I did on the rectangle on the left. So, guess what? Another way to measure the area of a rectangle or square is to find how many rows (*drag your finger across each row as you say "1 row, 2 rows, 3 rows 4 rows")* and find how many tiles in each row…1, 2, 3 (*point to each tile in the first row).* When you hear "each row" that means you look at one group, or one row, and see how many tiles there are.

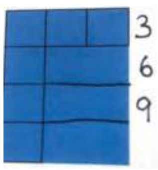
Even though some of the square tiles are missing, we see that we have 4 rows of 3 units. Say it with me: 4 rows of 3 units. Who can slide their finger across each row? (*Have student slide finger across each row and they say, "1 row, 2 rows, 3 rows, 4 rows").* Who can point to how many in each row? (*Have student point to 3 tiles in one row).* Finally you skip count to calculate the area.



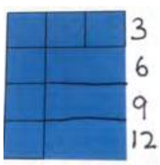
We will skip count by three four times. The first row has 3.



And, another 3 in the second row so now we're at 6.



And another 3 in the third row so now we're at 9.



And finally, another 3 in the last row so now we're at 12. So, this rectangle has an area of 12 squares. That means it has an area of 12 square units *(fill in the 12 in the sentence)*. That is the same amount we got when we counted ALL the squares! Let's read the math sentence together: 4 rows of 3 units = 12 square units.

Note: If students are struggling to skip count, you can have them whisper the number and say the last one in the row louder while you write the number. For example, whisper 1, 2, say and label 3. Whisper 4, 5, say and label 6, etc.

Note: The term "in each row" might be confusing for students, especially MLL learners. This is something you will have to continue to review. If students struggle with this concept, you can say, "When we say each row, look at the first row and see how many are in 1 row, or 1 group." You can also practice this with objects using "in each group" to describe the groups.

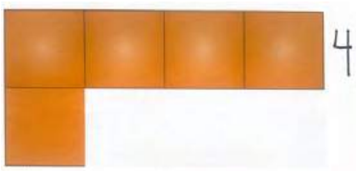
Let's Think (Slide 6): That was pretty easy, right? But what if you have a rectangle with no tiles? You're probably wondering, how do you find the number of rows and how many tiles in each row? Let me show you. Let's look at this rectangle. These are the side lengths. (*Trace sides with your finger*). First, watch me as I fill in this side length *(point to the vertical side length)* with tiles to figure out how many rows.

Let's Think (Slide 7): How many squares did I use? You used 2 squares. That means if we continue to fill in the tiles to form rows *(trace each row with your finger as you say it)*, we'd have 1 row, 2 rows.

So we can imagine we have 2 rows. Now I'm wondering how many tiles will be in each row? Remember when we say "each row" we can look at the first row and see how many tiles are in one group. We can figure that out by seeing how many tiles are in the top row. Let's fill in the top row with tiles.

Let's Think (Slide 8): So, we know that we have 2 rows and now we need to see how many tiles are in the top row? 4 tiles! We can see in 1 row there are 4 tiles. So we can imagine if we filled in all the tiles we would have: 2 rows of 4 tiles (*write "2 rows of 4 tiles" on the slide*). Say it with me: 2 rows of 4 tiles.

We can fill in all the tiles and count them like we did yesterday. But why might it be helpful to skip count the tiles in the rows instead of counting each square? It's faster!



When calculating the area we won't always have enough tiles, so we can use this strategy to help us. It is also much faster, especially if our rectangle is really large! If I know there are 2 rows and each row has 4 tiles, I can skip count by 4s two times. Watch me as I label the rows while I count. I can see 4 tiles here.

Then I can imagine 4 more tiles on this row, that's 8 in all/

If I skip count by 4s two times, I get 8 tiles. If I fill in the tiles and count them, would I also get 8 tiles? Yes you will still get 8 tiles if you count them. Let's check, count them all with me!

So, I can find the area of a rectangle or square by filling in and counting the square inch tiles *(point to each tile)*. But I can also find how many rows *(slide your finger across each row)* and how many tiles are in each row *(touch all the tiles in the first row),* then I can skip count because I'm imagining the tiles in each row. 4, 8. That will help me find the area of the flat shape without filling in all the tiles. It will save me a lot of time!

Let's Think (Slide 9): And finally, before we start practicing more together, let's review what we learned yesterday about using units to find area. Remember, whenever we're talking about units for area, what very important word do we use in all the units? Square! Yes we use square units. So if we're using inches to measure an area we say SQUARE INCHES. If we're using centimeters to measure area we say SQUARE CENTIMETERS. If we're using yards to measure area we say SQUARE YARDS.

Let's Try it (Slides 10-11): Now let's work on finding the area of rectangles by finding the number of rows and how many tiles are in each row. We are going to work on the first page step-by-step. Remember when we are finding the area we are finding what? The amount of space a flat shape takes up. There can be no gaps and no overlaps!

WARM WELCOME

Let's Review:

AREA is the amount of space a flat shape (two-dimensional shape) takes up.

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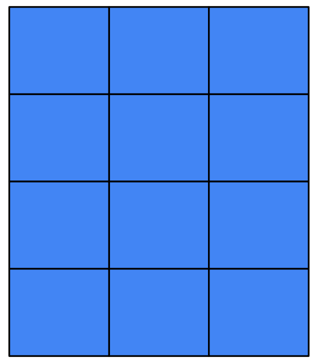
Let's Review:

To find the area of a rectangle, we can count the square tiles.



Remember, there must be no gaps and no overlaps!

Today we will measure the **area** of a rectangle by using equal groups and skip counting.

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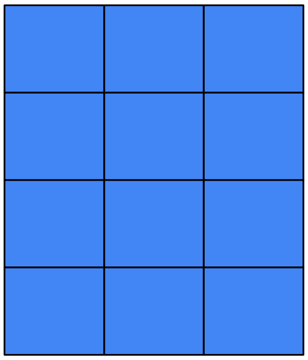
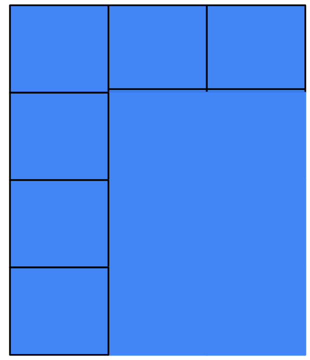
Let's Talk:

What are some other ways we can find the area?





Let's Think:

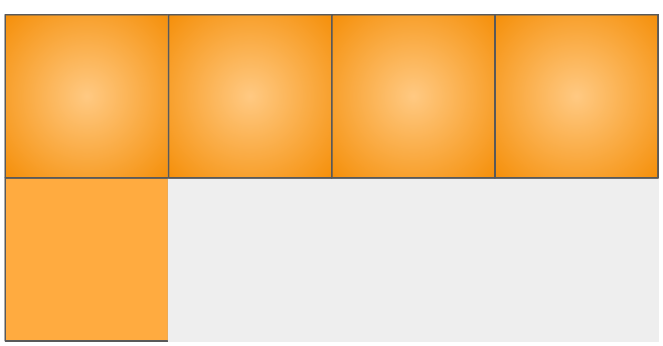
How many rows are in this rectangle?

Let's Think:

How many rows are in this rectangle?

Let's Think:

How many tiles in each row?



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Let's Think:

Review from yesterday

square units (sq un)

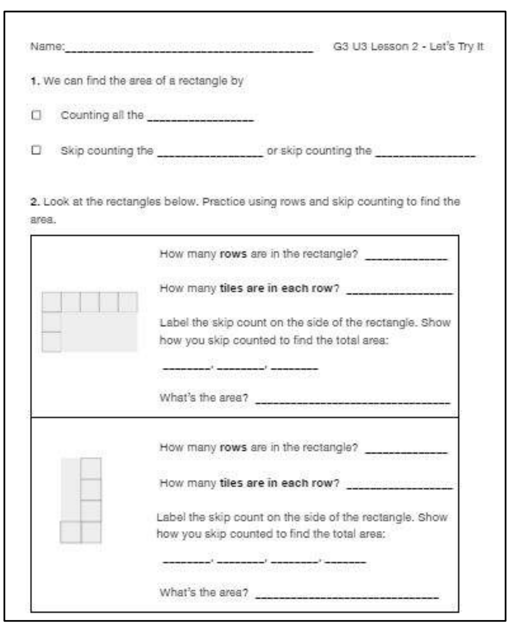
square inches (sq in)

square centimeters (sq cm)

square yards (sq yd)

Let's Try It:

Together, let's explore measuring the area of rectangles by skip counting the tiles in each row together!



Name:________________________ G3 U3 Lesson 2 - Let's Try It

1. We can find the area of a rectangle by

☐ Counting all the ______________

☐ Skip counting the ______________ or skip counting the ______________

2. Look at the rectangles below. Practice using rows and skip counting to find the area.

How many **rows** are in the rectangle? __________

How many **tiles are in each row**? ______________

Label the skip count on the side of the rectangle. Show how you skip counted to find the total area:

_______, _______, _______

What's the area? ______________________

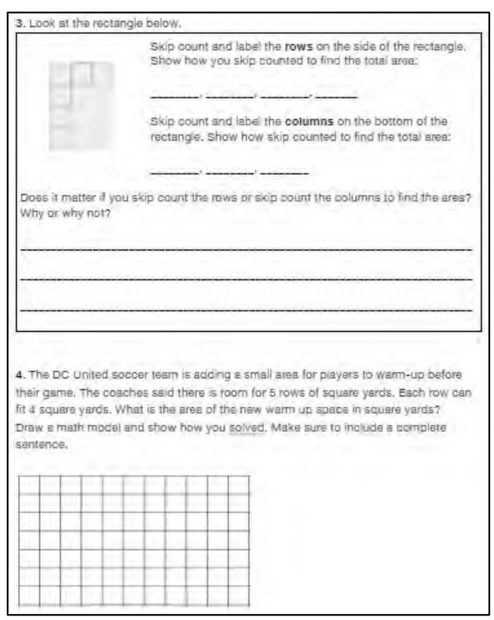
How many **rows** are in the rectangle? __________

How many **tiles are in each row**? ______________

Label the skip count on the side of the rectangle. Show how you skip counted to find the total area:

_______, _______, _______, _______

What's the area? ______________________



3. Look at the rectangle below.

Skip count and label the **rows** on the side of the rectangle. Show how you skip counted to find the total area:

_______, _______, _______, _______

Skip count and label the **columns** on the bottom of the rectangle. Show how skip counted to find the total area:

_______, _______, _______

Does it matter if you skip count the rows or skip count the columns to find the area? Why or why not?

____

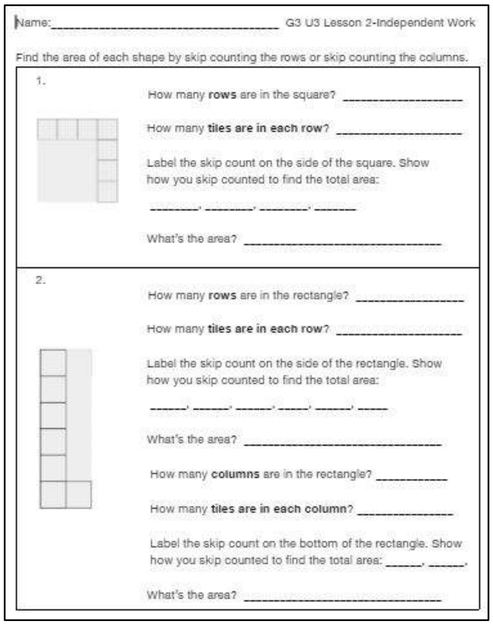
____

____

4. The DC United soccer team is adding a small area for players to warm-up before their game. The coaches said there is room for 5 rows of square yards. Each row can fit 4 square yards. What is the area of the new warm up space in square yards? Draw a math model and show how you solved. Make sure to include a complete sentence.

On your Own:

Now you can measure the area of rectangles by skip counting the tiles in each row on your own!



Name:______________________________ G3 U3 Lesson 2-Independent Work

Find the area of each shape by skip counting the rows or skip counting the columns.

1.

How many **rows** are in the square? ________________

How many **tiles are in each row**? _________________

Label the skip count on the side of the square. Show how you skip counted to find the total area:

_______, _______, _______, ______

What's the area? ___________________________

2.

How many **rows** are in the rectangle? _______________

How many **tiles are in each row**? _________________

Label the skip count on the side of the rectangle. Show how you skip counted to find the total area:

_____, _____, _____, _____, _____, _____

What's the area? ___________________________

How many **columns** are in the rectangle? __________

How many **tiles are in each column**? _____________

Label the skip count on the bottom of the rectangle. Show how you skip counted to find the total area: _____, _____.

What's the area? ___________________________

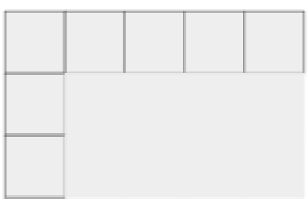
Name:________________________________

1. We can find the area of a rectangle by

☐ Counting all the ________________

☐ Skip counting the ________________ or skip counting the ________________

2. Look at the rectangles below. Practice using rows and skip counting to find the area.



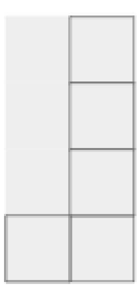
How many **rows** are in the rectangle? ____________

How many **tiles are in each row**? ________________

Label the skip count on the side of the rectangle. Show how you skip counted to find the total area:

_______, _______, _______

What's the **area**? ______________________________



How many **rows** are in the rectangle? ____________

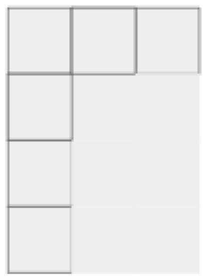
How many **tiles are in each row**? ________________

Label the skip count on the side of the rectangle. Show how you skip counted to find the total area:

_______, _______, _______, ______

What's the **area**? ____________________________

3. Look at the rectangle below.



Skip count and label the **rows** on the side of the rectangle. Show how you skip counted to find the total area:

________, ________, ________, _______

Skip count and label the **columns** on the bottom of the rectangle. Show how skip counted to find the total area:

________, ________, ________

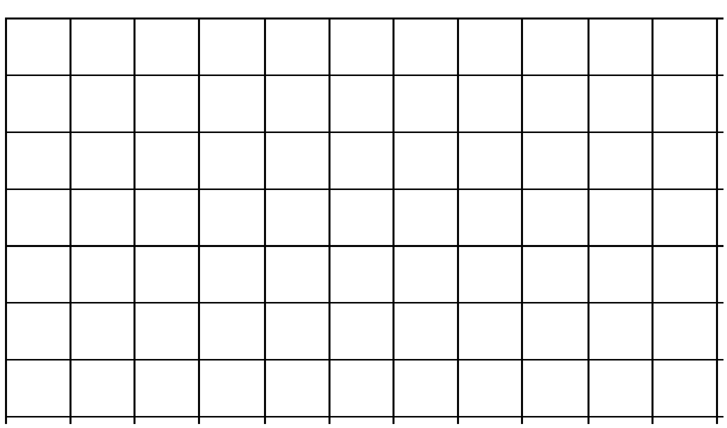
Does it matter if you skip count the rows or skip count the columns to find the area? Why or why not?

____

____

____

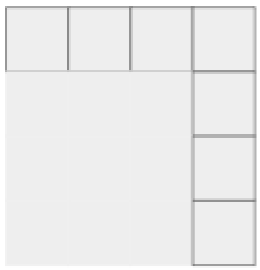
4. The DC United soccer team is adding a small area for players to warm-up before their game. The coaches said there is room for 5 rows of square yards. Each row can fit 4 square yards. What is the area of the new warm up space in square yards? Draw a math model and show how you solved. Make sure to include a complete sentence.



Name:________________________________ G3 U3 Lesson 2-Independent Work

Find the area of each shape by skip counting the rows or skip counting the columns.

1.



How many **rows** are in the square? ____________________

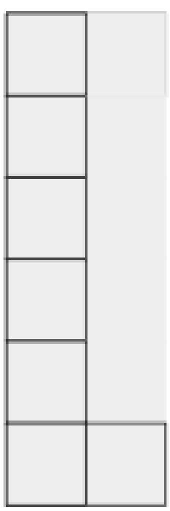
How many **tiles are in each row**? _____________________

Label the skip count on the side of the square. Show how you skip counted to find the total area:

_______, _______, _______, _______

What's the **area**? _________________________________

2.



How many **rows** are in the rectangle? __________________

How many **tiles are in each row**? _____________________

Label the skip count on the side of the rectangle. Show how you skip counted to find the total area:

______, ______, ______, _____, ______, _____

What's the **area**? _________________________________

How many **columns** are in the rectangle? ____________

How many **tiles are in each column**? ________________

Label the skip count on the bottom of the rectangle. Show how you skip counted to find the total area: ______, ______,

What's the **area**? _________________________________

Name:___________________________________

1. We can find the area of a rectangle by

☐ Counting all the tiles

☐ Skip counting the rows or skip counting the columns

2. Look at the rectangles below. Practice using rows and skip counting to find the area.

How many **rows** are in the rectangle? 3 rows

How many **tiles are in each row**? 5 tiles

Label the skip count on the side of the rectangle. Show how you skip counted to find the total area:

5, 10, 15

What's the **area**? 15 square units

How many **rows** are in the rectangle? 4 rows

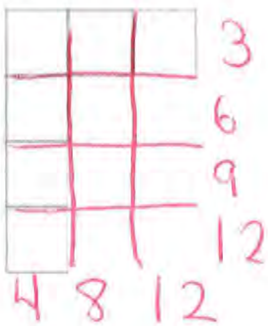
How many **tiles are in each row**? 2 tiles

Label the skip count on the side of the rectangle. Show how you skip counted to find the total area:

2, 4, 6, 8

What's the **area**? 8 square units

3. Look at the rectangle below.



Skip count and label the **rows** on the side of the rectangle. Show how you skip counted to find the total area:

3, 6, 9, 12

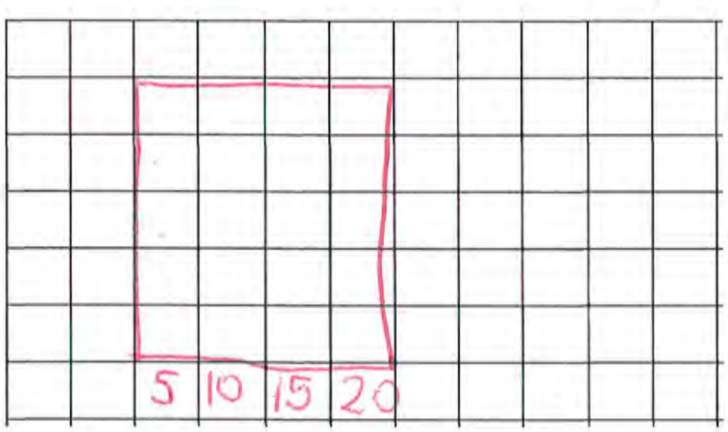
Skip count and label the **columns** on the bottom of the rectangle. Show how skip counted to find the total area:

4, 8, 12

Does it matter if you skip count the rows or skip count the columns to find the area? Why or why not?

No it doesn't matter. You can skip count all the rows or all the columns. It is the same number of squares.

4. The DC United soccer team is adding a small area for players to warm-up before their game. The coaches said there is room for 5 rows of square yards. Each row can fit 4 square yards. What is the area of the new warm up space in square yards? Draw a math model and show how you solved. Make sure to include a complete sentence.



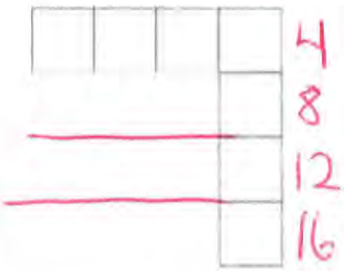
The area of the new space is 20 square yards.

Note: Skip counting by 5s might be easier than skip counting by 4s.

Name:______________________________ G3 U3 Lesson 2-Independent Work

Find the area of each shape by skip counting the rows or skip counting the columns.

1.



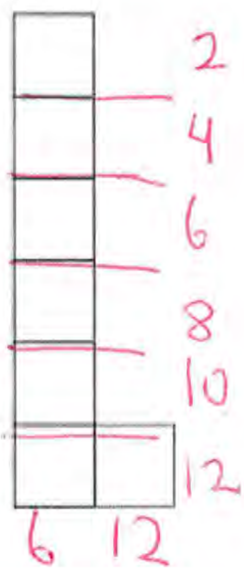
How many **rows** are in the square? 4 rows

How many **tiles are in each row**? 4 tiles

Label the skip count on the side of the square. Show how you skip counted to find the total area:
4, 8, 12, 16

What's the **area**? 16 square units

2.



How many **rows** are in the rectangle? 6 rows

How many **tiles are in each row**? 2 tiles

Label the skip count on the side of the rectangle. Show how you skip counted to find the total area:
2, 4, 6, 8, 10, 12

What's the **area**? 12 square units

How many **columns** are in the rectangle? 2 columns

How many **tiles are in each column**? 6 tiles

Label the skip count on the bottom of the rectangle. Show how you skip counted to find the total area: 6, 12,

What's the **area**? 12 square units

Note: point out that they can skip count rows or columns and they get the same total!

G3 U3 Lesson 3

Multiply the side lengths to find the area of rectangles

CITYTUTOR DC

G3 U3 Lesson 3 - Students will multiply the side lengths to find the area of rectangles

Materials:
- Grid paper to support students with practice page and independent work

Warm Welcome (Slide 1): Tutor choice.

Let's Review (Slide 2-3): We've been learning a lot about area! We know that area is the amount of space a flat shape takes up. So far, we've learned two ways you can find the area of a rectangle. We learned that you can find the area by filling in a shape with square tiles and counting them all. We also learned that you can find the area using equal groups and skip counting. We can do that by finding how many rows, how many tiles in each row and then skip counting the tiles in each row. We also explored that we can do the same thing with columns, by looking at the groups that are going up and down. Well today we're going to add to our area toolbox and we are going to learn a third way to find the area of rectangles and squares.

Frame the Learning/Connect to Prior Learning (Slide 4): Today we will multiply the side lengths to find the area of a rectangle. In our first unit, we learned about multiplication. We know that multiplication uses the TIMES sign and to multiply something means to make equal groups. We explored equal groups yesterday in rows and columns of rectangles and squares so today we'll connect that work to what we already know about multiplication.

Let's Talk (Slide 5): Before we learn how to measure the side lengths of the rectangle, let's go over some different ways you might see rectangles described. Look at this rectangle. T**urn and talk to the person next to you…what are some ways you could describe this rectangle and why?** Possible Student Answers, Key Points:
- There are 2 rows of 4
- There are 4 columns of 2
- There are 2 units by 4 units
- There are 2 rows by 4 columns
- The area is 12 square units

Those are all great ways to describe the rectangles. We can look at the rows and columns and describe it using different language that describes EQUAL groups. Let me show you another way.

Let's Think (Slide 6): Let's learn how to measure the side lengths to calculate area! Let's look at the top of this rectangle. This is the side length (*drag finger across the top*). To find the length of this side I look at how many columns we have, there are 4. So the length of this side is 4 units…1, 2, 3, 4 (*drag finger as you count*). Let's label this length as 4 units.

Now, let's find this side length, going up and down (drag finder). TO find the length of this sign, I look at how many rows we have, there are 2. So the length of this side is 2 units…1, 2 (*drag finger as you count*). Let's label this length as 2 units.

Let's Think (Slide 7): And look, I don't have to label every side length because the two sides that are opposite have the same length (*point*). So, another way to find the area of this rectangle is to multiply the two side lengths. We said that we had 2 rows of 4 and another way to say that is 2 groups of 4 and ANOTHER way to say that is 2x4. So we can multiply the sides to find the area, 2 times 4 is…8!

Let's Think (Slide 8): We just found two of the side lengths of this rectangle. What is the relationship between the side lengths and the number of tiles on a side? They are the same! If there are 2 tiles then the side length is 2. If there are 4 tiles, then the side length is four. Correct! You can count the tiles on the side to find the side length. Or you can find the side length by drawing those lines, like we just did.

Let's Think (Slide 9): It is really important that we understand and make the connection of WHY we can multiply the side lengths when finding the area. Yesterday we proved if we filled in all of the tiles of this rectangle we have 2 rows of 4 or 2 groups of 4. And, in your multiplication unit you learned that "rows of" or "groups of" means to multiply.

We have 2 rows of 4, or four and four (*point)*. We could add 4 + 4, or we could skip count by 4s two times. And you all know that repeated addition and skip counting are the same as multiplication! So when we multiply the side lengths, it's much more efficient than counting all the squares, and it's the same as skip counting, but it's faster once you know your multiplication facts. Really, you could find the area of a rectangle using any of the three strategies that makes sense to you. You can count the squares, skip count the rows or columns, OR multiply the side lengths!

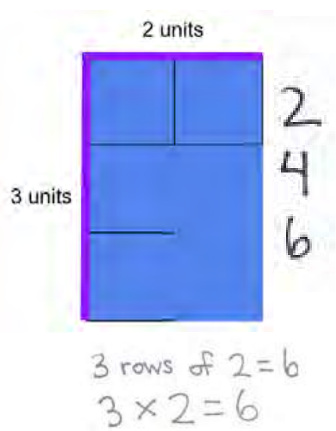
Could we multiply 2 units x 2 units to find the area of this shape? (*Point to the two parallel sides)* No! That doesn't show us how many rows AND how many are in each row. When we multiply the side lengths, we need to make sure we're multiplying the number of rows by the number of columns *(point to the two perpendicular side lengths)*.

Let's Think (Slide 10): Look at this area model. An area model is a rectangle without the tiles filled in. Let's use the side lengths to find the area of this rectangle. What are the side lengths? 3 units and 2 units! How can we find the area of a rectangle if we only know the side lengths? Possible Student Answers, Key Points:

- We could use the tiles to fill it in. If you didn't have tiles you could use grid paper and draw the side lengths, then count the squares.
- We could use the tiles to fill in the rows and fill in how many in each row. Then we skip count as we imagine all the tiles.
- We can multiply the side lengths.

Those are all terrific ideas, let's find the area by multiplying the side lengths. We know that one side is 3, so I can imagine there are three rows (*drag finger across 3 times*) and the other side is 2, so I can imagine there are 2 columns, or two in each row. So, to find the area I can do 3 x 2. And 3x2 is…6*!*

Let's Think (Slide 11): And, look! Here's the same rectangle with some tiles to show us why that makes sense. This side is 3 units, here are the 3 tiles *(point to each tile.)* We can see there are three rows. And, there will be how many tiles in each row? 2! How many tiles in each row is the same as the number of columns. How many columns? 2 columns!



Therefore we can skip count by 2s three times. 2, 4, 6 *(Label 2, 4, 6 next to each row).* So now we know 3 rows of 2 = 6. Or 3 x 2 = 6. *(Write these equations on the slide).* The area is 6 square units (*fill in 6 in the blank).*

Let's Think (Slide 12): Before we practice more together it's important to notice the difference between the units we use when we measure area and units we use when we measure length. What do you notice? All the area ones have the word square in them. Yes, when we find the area, we always have SQUARE units because we are finding the space it takes up, or counting how many squares, or tiles to fill in the rectangle. When we measure the side lengths, we put the unit without the word “square,” because we’re just measuring how long it is.

Let’s Think (Slide 16): To review, what are the three ways we can find the area of rectangles and squares?

Let’s Try it (Slides 17-18): Now let’s work on finding the area of rectangles by multiplying the side lengths. We are going to work on the first page step-by-step. Remember when we are finding the area we are finding what? The amount of space a flat shape, or two-dimensional shape, takes up. There can be no gaps and no overlaps! If you have trouble multiplying the side lengths that’s okay! We can use grid paper to help us draw the rectangle and see how to skip count.

WARM WELCOME

Let's Review:

AREA is the amount of space a flat shape (two-dimensional shape) takes up.

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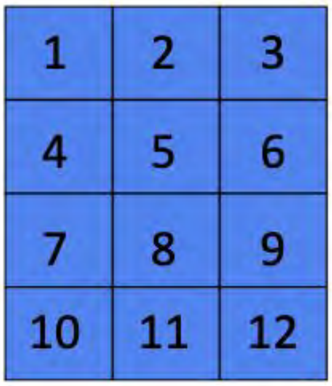
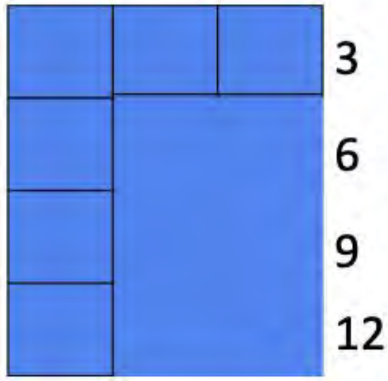
Let's Review:

How can we find the area of a rectangle?

We can fill the inside and count the square tiles.



We can skip count the equal groups.



Today we'll learn a new way…

?

Today we will **multiply** the side lengths to find the area of rectangles.

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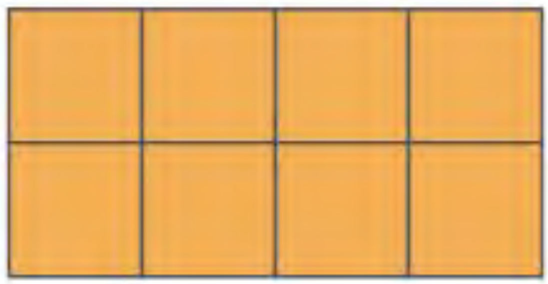
Let's Talk:

What are some ways we can describe this rectangle?

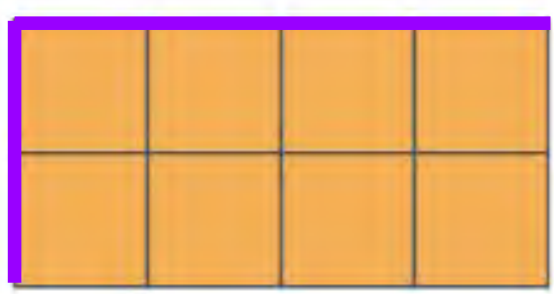


Let's Think:

Let's measure the side lengths.

_____ units

_____ units

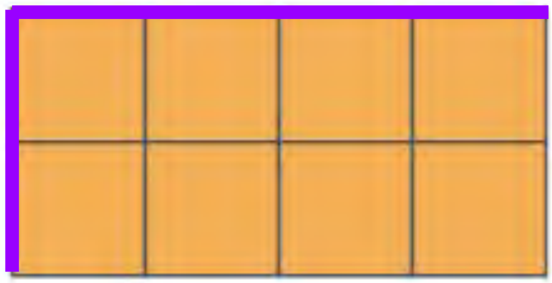


Let’s Think:

Let’s multiply to find area.

_____ units

_____ units



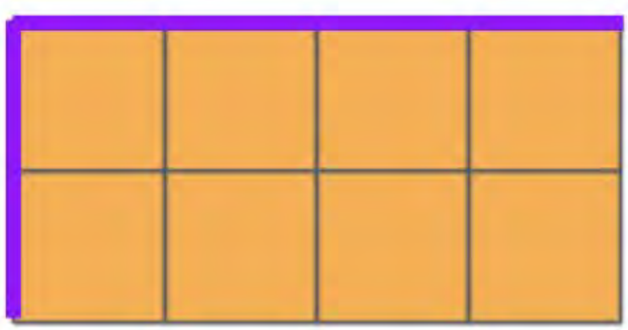
________ X _________ = _________ square units

Let’s Think:

What is the relationship between the side lengths and the number of tiles on a side?

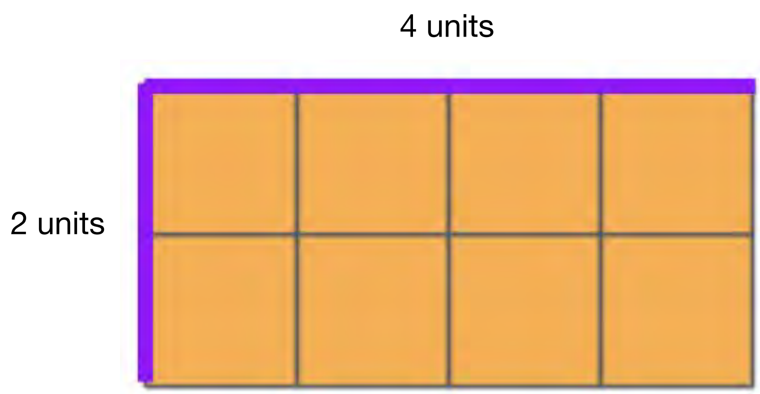
4 units

2 units



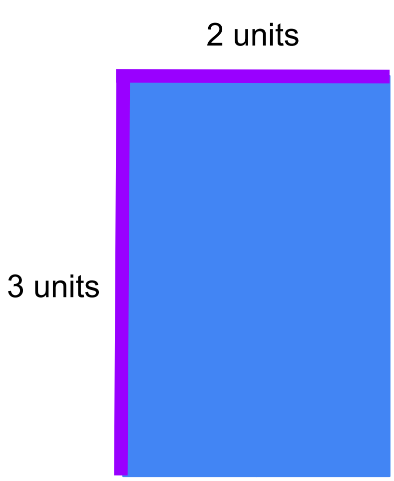
Let's Think:

Let's explore why it makes sense that we can multiply the side lengths to find the area.



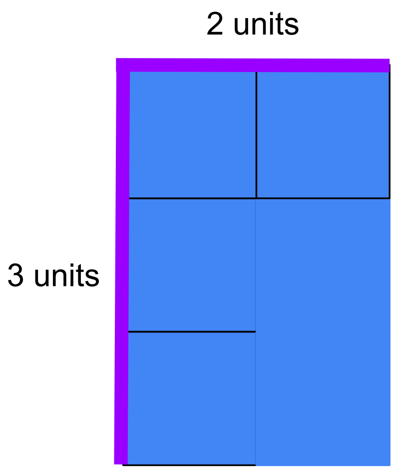
Let's Think:

Let's multiply side lengths to find the area!



Let's Think:

Let's multiply side lengths to find the area!



Let's Think:

What do you notice?

Area:	Side lengths:
square units (sq un)	units (un)
square inches (sq in)	inches (in)
square centimeters (sq cm)	centimeters (cm)
square yards (sq yd)	yards (yd)

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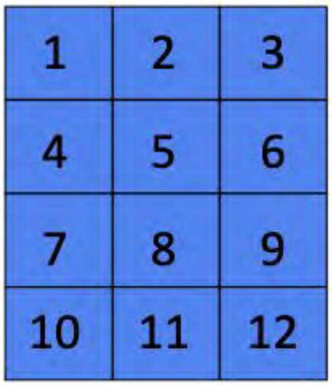
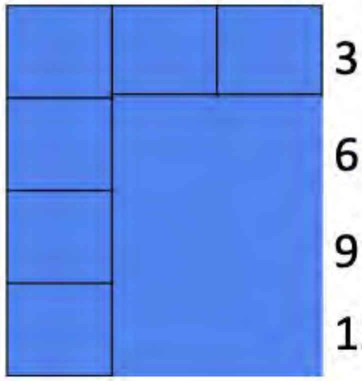
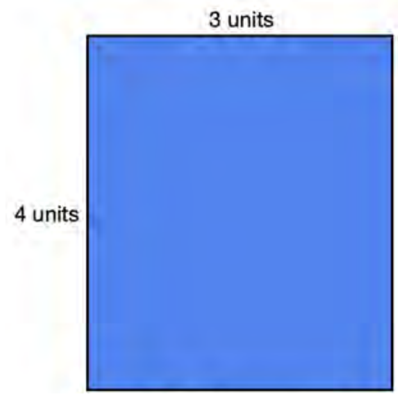
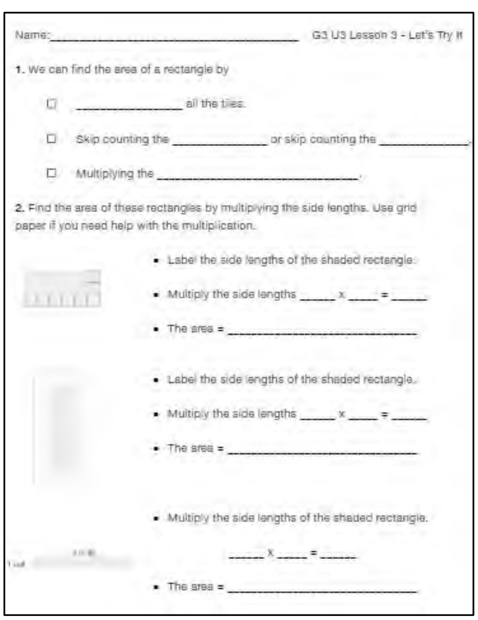
Let's Review: How can we find the area of a rectangle?

We can fill the inside and **count all** the square tiles.	We can **skip count** the equal groups.	We can **multiply** the side lengths.
		 **4 x 3 = 12 square units**

Let's Try It: Let's explore finding the area of rectangles by multiplying the side lengths together!



Name:______________________ G3 U3 Lesson 3 - Let's Try It

1. We can find the area of a rectangle by

- ☐ ____________ all the tiles.
- ☐ Skip counting the ____________ or skip counting the ____________.
- ☐ Multiplying the ______________________.

2. Find the area of these rectangles by multiplying the side lengths. Use grid paper if you need help with the multiplication.

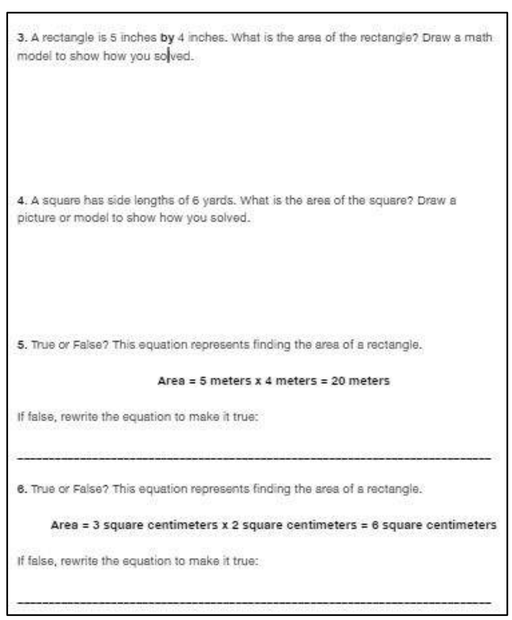
- Label the side lengths of the shaded rectangle.
- Multiply the side lengths _____ x _____ = _____
- The area = ______________________

- Label the side lengths of the shaded rectangle.
- Multiply the side lengths _____ x _____ = _____
- The area = ______________________

- Multiply the side lengths of the shaded rectangle.

_____ x _____ = _____

- The area = ______________________



3. A rectangle is 5 inches **by** 4 inches. What is the area of the rectangle? Draw a math model to show how you solved.

4. A square has side lengths of 6 yards. What is the area of the square? Draw a picture or model to show how you solved.

5. True or False? This equation represents finding the area of a rectangle.

Area = 5 meters x 4 meters = 20 meters

If false, rewrite the equation to make it true:

____

6. True or False? This equation represents finding the area of a rectangle.

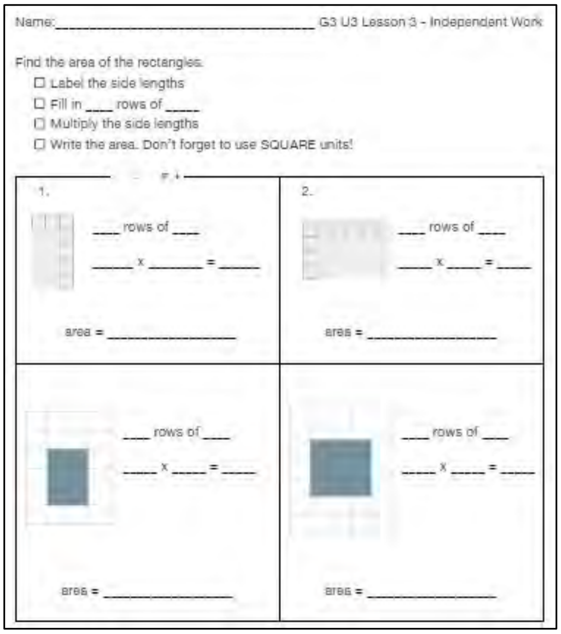
Area = 3 square centimeters x 2 square centimeters = 6 square centimeters

If false, rewrite the equation to make it true:

____

On your Own:

Now you can find the area of rectangles by multiplying the side lengths on your own!

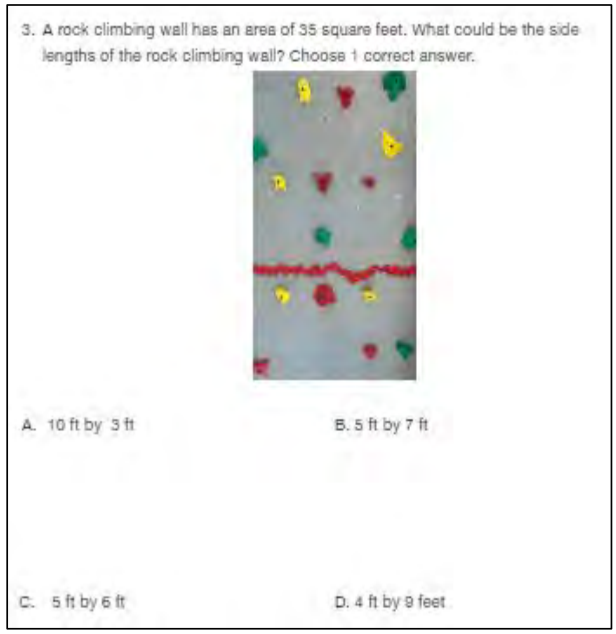


Name:_________________________________ G3 U3 Lesson 3 - Independent Work

Find the area of the rectangles.

- ☐ Label the side lengths
- ☐ Fill in ____ rows of _____
- ☐ Multiply the side lengths
- ☐ Write the area. Don't forget to use SQUARE units!

1. ____ rows of ____ ______ x _______ = ______ area = ________________	2. ____ rows of ____ _____ x _____ = _____ area = ________________
____ rows of ____ ______ x _____ = _____ area = ________________	____ rows of ____ _____ x _____ = _____ area = ________________



3. A rock climbing wall has an area of 35 square feet. What could be the side lengths of the rock climbing wall? Choose 1 correct answer.

A. 10 ft by 3 ft

B. 5 ft by 7 ft

C. 5 ft by 6 ft

D. 4 ft by 9 feet

1. We can find the area of a rectangle by…

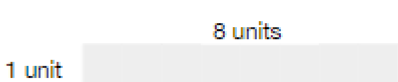
- ☐ _________________ all the tiles.
- ☐ Skip counting the _______________ or skip counting the _______________.
- ☐ Multiplying the ________________________________.
- ☐

---

2. Find the area of these rectangles by multiplying the side lengths. Use grid paper if you need help with the multiplication.

- Label the side lengths of the shaded rectangle.
- Multiply the side lengths ______ x _____ = ______
- The area = ______________________________

- Label the side lengths of the shaded rectangle.
- Multiply the side lengths ______ x _____ = ______
- The area = ______________________________



- Multiply the side lengths ______ x _____ = ______
- The area = ______________________________

3. A **rectangle** is **5 inches by 4 inches.** What is the area of the rectangle? Draw a math model to show how you solved.

4. A **square** has side lengths of **6 yards.** What is the area of the square? Draw a picture or model to show how you solved.

5. True or False? This equation represents finding the area of a rectangle.

Area = 5 m x 4 m = 20 meters

If false, rewrite the equation to make it true: ____

6. True or False? This equation represents finding the area of a rectangle.

Area = 3 square cm x 2 square cm = 6 square cm

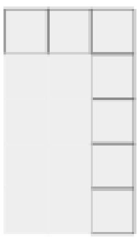
If false, rewrite the equation to make it true: ____

Name:_________________________________ G3 U3 Lesson 3 - Independent Work

Find the area of the rectangles.

- ☐ Label the side lengths
- ☐ Fill in ____ rows of _____
- ☐ Multiply the side lengths
- ☐ Write the area. Don't forget to use SQUARE units!

1.

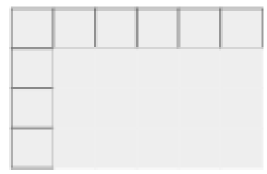


____ rows of ____

______ x ________ = ______

area = ___________________

2.

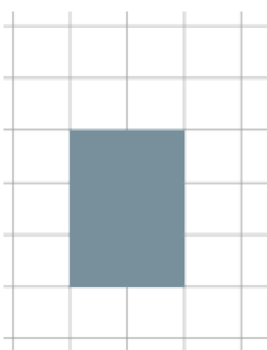


____ rows of ____

_____ x _____ = _____

area = ___________________

3.

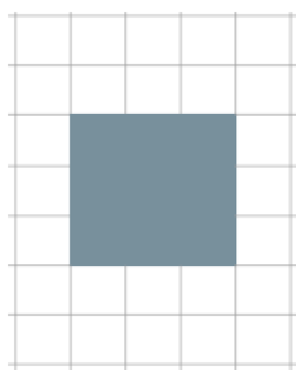


____ rows of ____

_____ x _____ = _____

area = ___________________

4.



____ rows of ____

_____ x _____ = _____

area = ___________________

5. A rock climbing wall has an area of 35 square feet. What could be the side lengths of the rock climbing wall? Choose one correct answer.

A. 10 ft by 3 ft

B. 5 ft by 7 ft

C. 5 ft by 6 ft

D. 4 ft by 9 feet

Name:______________________________ G3 U3 Lesson 3 - Let's Try It

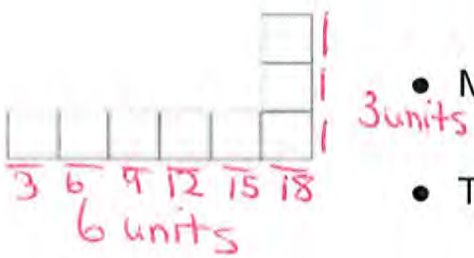
1. We can find the area of a rectangle by

☐ Counting all the tiles.

☐ Skip counting the rows or skip counting the columns.

☐ Multiplying the side lengths.

2. Find the area of these rectangles by multiplying the side lengths. Use grid paper if you need help with the multiplication.



- Label the side lengths of the shaded rectangle.
- Multiply the side lengths 3 x 6 = 18
- The area = 18 sq un

- Label the side lengths of the shaded rectangle.
- Multiply the side lengths 7 x 2 = 14
- The area = 14 sq un

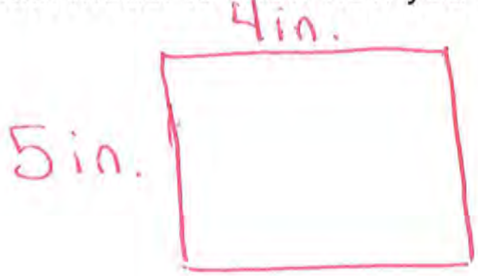
Note: They might need support using the grid paper to help them find the side lengths.

- Multiply the side lengths of the shaded rectangle.

1 x 8 = 8

- The area = 8 sq un

3. A **rectangle** is **5 inches by 4 inches.** What is the area of the rectangle? Draw a math model to show how you solved.



5 rows of 4

$5 \times 4 = 20$

Area = 20 sq in

4. A **square** has side lengths of **6 yards**. What is the area of the square? Draw a picture or model to show how you solved.

6 rows of 6

$6 \times 6 = 36$ 6, 12, 18, 24, 30, 36

Area = 36 sq yd

Note: They can draw this on grid paper to help them skip count by 6s.

5. True or False? This equation represents finding the area of a rectangle.

Area = 5 meters x 4 meters = 20 meters

If false, rewrite the equation to make it true:

Area = 5 meters x 4 meters = 20 square meters

6. True or False? This equation represents finding the area of a rectangle.

Area = 3 square centimeters x 2 square centimeters = 6 square centimeters

If false, rewrite the equation to make it true:

Area = 3 centimeters x 2 centimeters = 6 square cm

Name:______________________________ G3 U3 Lesson 3 - Independent Work

Find the area of the rectangles.

- ☐ Label the side lengths
- ☐ Fill in ____ rows of _____
- ☐ Multiply the side lengths
- ☐ Write the area. Don't forget to use SQUARE units!

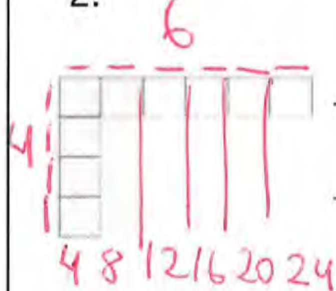
1.

5 rows of 3

5 x 3 = 15

area = 15 sq un

2.



4 rows of 6

4 x 6 = 24

area = 24 sq un

3 rows of 2

3 x 2 = 6

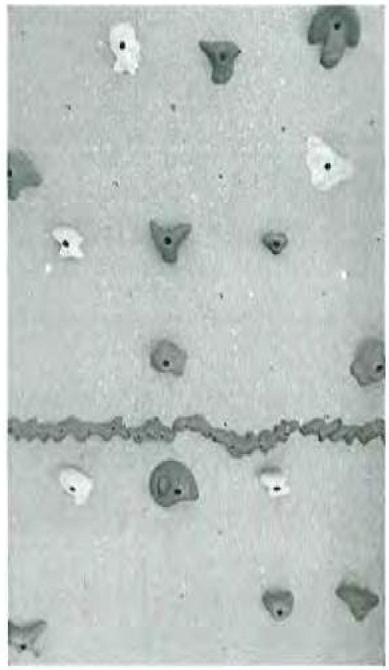
area = 6 sq un

3 rows of 3

3 x 3 = 9

area = 9 sq un

3. A rock climbing wall has an area of 35 square feet. What could be the side lengths of the rock climbing wall? Choose 1 correct answer.



A. 10 ft by 3 ft

$10 \times 3 = 30$

B. 5 ft by 7 ft

$5 \times 7 = 35$

C. 5 ft by 6 ft

$5 \times 6 = 30$

D. 4 ft by 9 feet

$4 \times 9 = 39$

4, 8, 12, 16, 20, 24, 28, 32, 36

G3 U3 Lesson 4

Decompose and recompose rectangles to compare areas

CITYTUTOR DC

G3 U3 Lesson 4 - Students will decompose and recompose rectangles to compare areas

Materials:

- Inch tiles and cm grid paper
    - Every students needs 20 inch tiles
    - Every student needs a piece of cm grid paper

Welcome (Slide 1): Tutor choice.

Let's Review (Slide 2-3): We've been making a lot of progress with learning about area! Let's remind ourselves, what is area? Area is the amount of space a flat shape takes up! And we've learned three different ways to find the area of a two-dimensional shape. Who remembers the three ways? Possible Student Answers, Key Points:

- We can count the tiles to find the area.
- We can find the area by skip counting the rows or columns to find the total squares, which is the area.
- We can find the area when we multiply the side lengths!

Frame the Learning/Connect to Prior Learning (Slide 4): Today we will decompose and recompose rectangles to compare areas. Decompose means to break apart and recompose means to put back together. Compare areas means to see if the area of one rectangle is bigger than, smaller than or the same as the area of another rectangle.

Let's Talk (Slide 5): With that in mind, **what do you notice about these shapes?** Possible Student Answers, Key Points:

- The rectangles look different and have different side lengths and number of rows and columns.
- They all have the same number of tiles so they all have the same area.
- One of the shapes isn't a rectangle, it's a hexagon.

Exactly! Rectangles and shapes made out of rectangles can have different side lengths and look different but have the same area, or take up the same amount of space. It's really important to calculate the area even if the rectangles look different to see if they have the same area or not.

Let's Think (Slide 6): I want to start by exploring how many different rectangles can we make with 6 square tiles. How many rectangles do you think we can make? *(Students guess).* If we only use these 6 square tiles to make a rectangle, what will the area be? 6 square units! That's right, no matter how we organize it, the area will be 6 square units since we're just rearranging the same number of tiles. We will compose, or make a rectangle, and then decompose, or take it apart, and then recompose, or make a new one with the same tiles. After you make a rectangle, we will draw it on our grid paper. Then we can decompose the rectangle and try to make it another way.

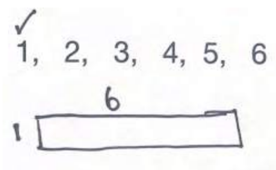
Students should work to compose different rectangles with 6 square tiles. After they compose them, show them how to draw it on the grid paper.

Let's share some of the rectangles we found that have an area of 6 square inches. Tell us the side lengths of the rectangle. You can say, "The area of a rectangle with 6 square inches can have a side length of _____ inches and a side length of _____ inches." *(Call on students to share. Make sure they follow this sentence frame so they can share accurately. Draw an example of the rectangle on the slide as they share.)*

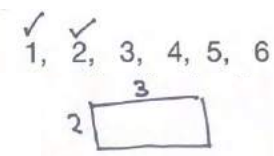
Let's Think (Slide 7): Let's check our work. Here are all the rectangles I found that have an area of 6 square units using the square inch tiles. How many rectangles are there? 4! Do they all have the same area? Yes! Do they all have the same side lengths? No! Let's label the side lengths. (*Label the side lengths, reinforcing how to count and label).*

What do you notice about the side lengths of Rectangle A and B? They both have a 2 and a 3 for side lengths but they are opposite. Correct! You can take a rectangle, for example this one that has 2 rows of 3, or 2 rows by 3 columns, and you can rotate it 90 degrees, or turn it like this *(model rotating with tiles or point to the second rectangle)*. Now you have 3 rows of 2 tiles or 3 rows by 2 columns. Your rows and columns switch places but your area, or total, stays the same! And, that's the same thing with Rectangles C and D, they have the same side lengths but they're switched!

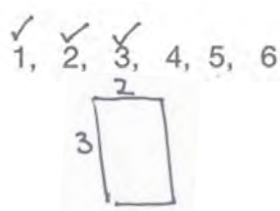
Let's Think (Slide 8): One way to find all the combinations is by moving the tiles around and making rectangles, like we just did. Another way is to skip count whole numbers and see if they go into the area evenly. Whole numbers are any of the numbers you say when you count by 1s starting at 0. Soon in third grade you will learn about fractions, which aren't whole numbers. But for now, let's focus on whole numbers.



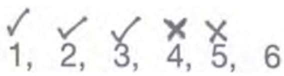
If I want to find all the rectangles that have an area of 6 square units, I can always start with 1 row of 6.



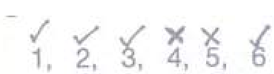
Now let's go in order and see if 2 is a factor of 6. Let's skip count by 2s together: 2, 4, 6. Yes, 2 goes into 6 evenly. It goes in how many times? *3 times!* Yes because I skip count by 2s 3 times to get six. So I could draw a rectangle with side lengths of 2 and 3. I can imagine 2 rows of 3 tiles.

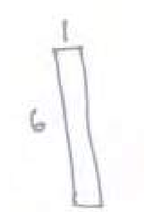


Next, let's see if 3 is a factor of 6. I can skip count by 3s. Let's count together…3, 6! Oh, 3 goes into 6 how many times? 2 times! Yes, 3 is a factor of 6 and it goes into 6 two times. We already knew that because if we have a rectangle that has 2 rows of 3, and we rotate it or turn it 90 degrees, then our rows and columns will switch places.



Next up is 4. Let's skip count by 4s together…4,8. Does 4 go into evenly? No! So 4 cannot be a side length for a rectangle with an area of 6 square units using whole numbers. Hmm, what about 5….can 5 be a side length for a rectangle with an area of 6 square units if we're only using whole numbers? Let's skip count by 5s together. 5, 10. Does 5 go into 6 evenly? No!





Now we're onto 6. We also know 6 and 1 are side lengths because it's the same as 1 row of 6 but we rotate the rectangle 90 degrees.

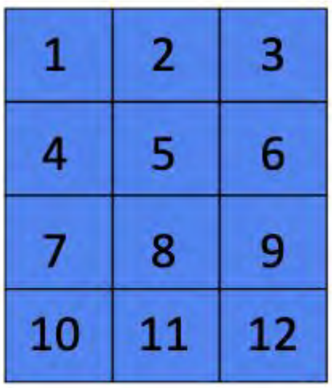
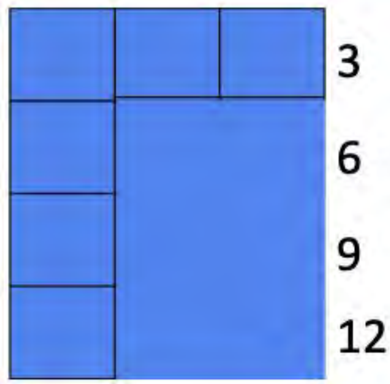
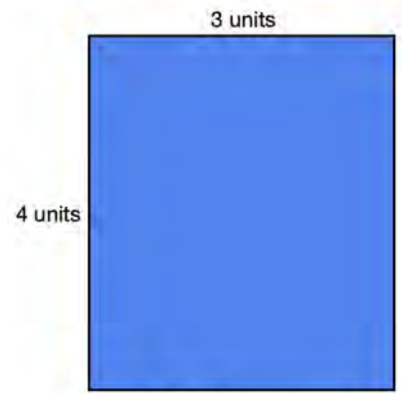
Let's Try it (Slides 9-10): Great job! Now let's work on comparing areas of rectangles. Don't forget to use your tiles to help you find ALL the different ways to make rectangles that have the same area and different side lengths! We are going to work on the first page step-by-step.

WARM WELCOME

Let's Review:

AREA is the amount of space a flat shape (two-dimensional shape) takes up.

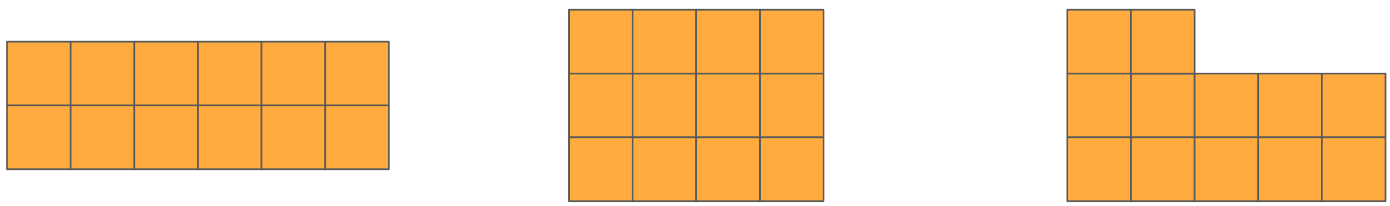
Let's Review: How can we find the area of a rectangle?

We can fill the inside and **count all** the square tiles.  	We can **skip count** the equal groups.  	We can **multiply** the side lengths.  **4 x 3 = 12 square units**

Today we will **decompose** and **recompose** rectangles to **compare areas.**

Let's Talk:

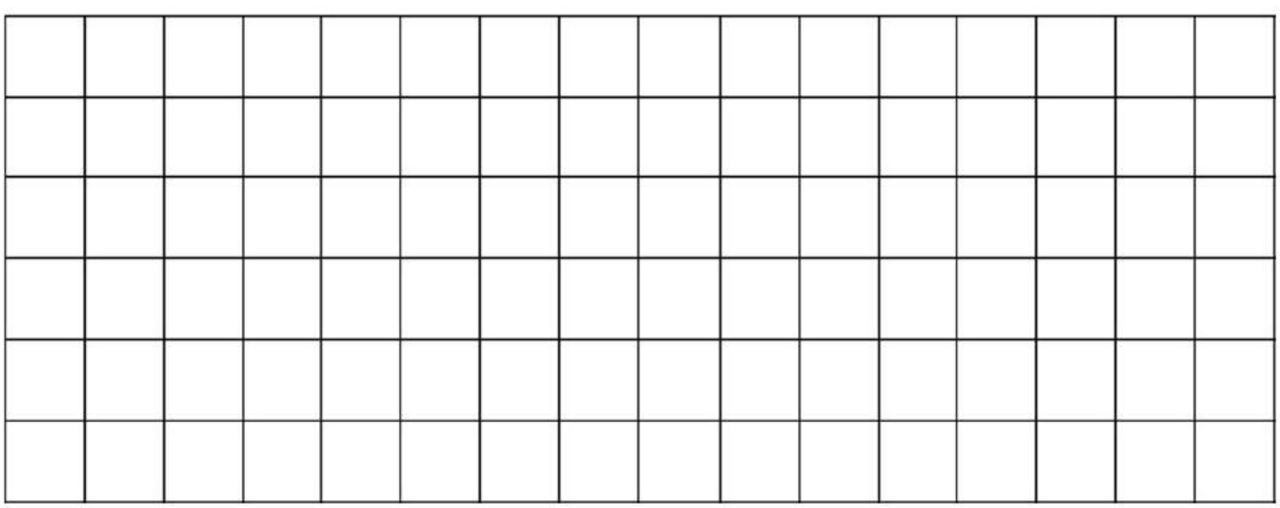
What do you notice?



Let's Think:

How many different rectangles can you make that all have an **area of 6 square inches**?

Record them on your grid paper as you go!



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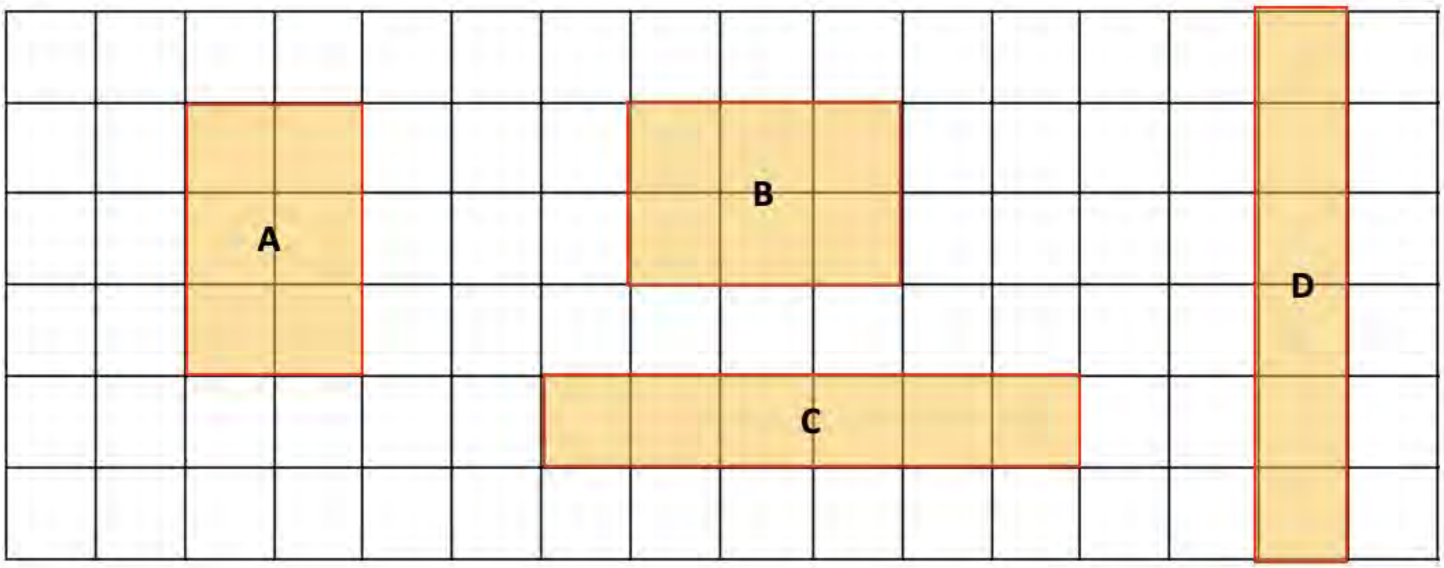
Let's Think:

Using the square inch tiles, there are four rectangles that have an area of 6 square units.



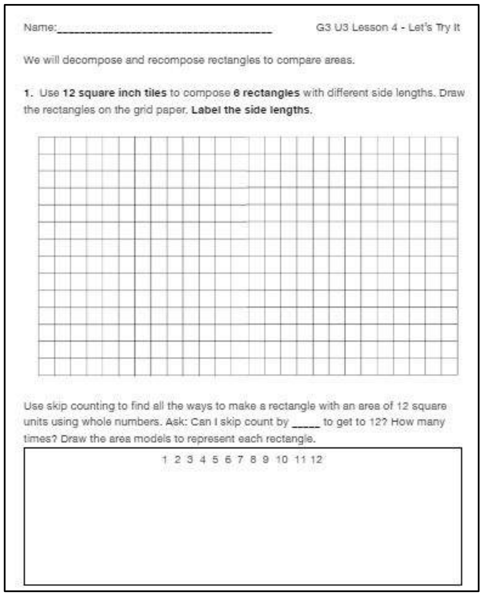
Let's Think:

I can use skip counting to help me find all the side lengths of a rectangle with an area of 6 square units?

1, 2, 3, 4, 5, 6

Let's Try It:

Let's explore comparing areas of rectangles together.



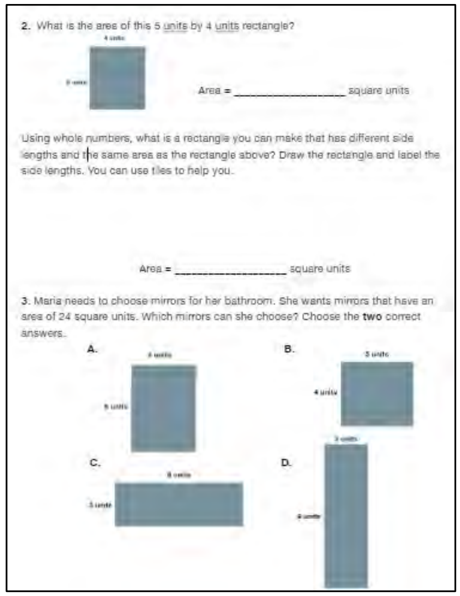
Name:___________________________ G3 U3 Lesson 4 - Let's Try It

We will decompose and recompose rectangles to compare areas.

1. Use **12 square inch tiles** to compose **6 rectangles** with different side lengths. Draw the rectangles on the grid paper. **Label the side lengths.**

Use skip counting to find all the ways to make a rectangle with an area of 12 square units using whole numbers. Ask: Can I skip count by _____ to get to 12? How many times? Draw the area models to represent each rectangle.

1 2 3 4 5 6 7 8 9 10 11 12



2. What is the area of this 5 units by 4 units rectangle?

Area = _______________ square units

Using whole numbers, what is a rectangle you can make that has different side lengths and the same area as the rectangle above? Draw the rectangle and label the side lengths. You can use tiles to help you.

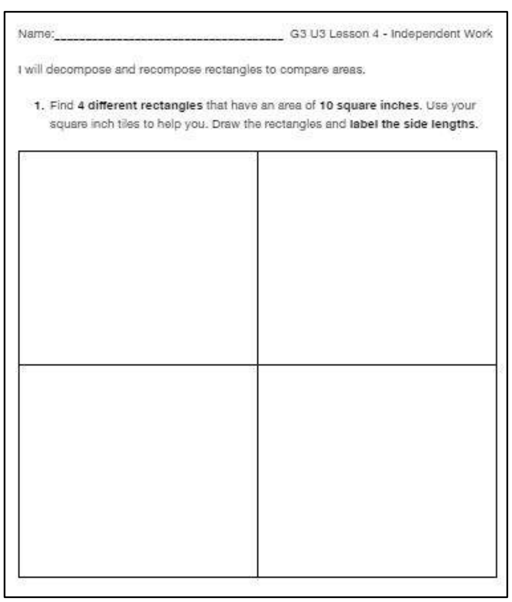
Area = _______________ square units

3. Maria needs to choose mirrors for her bathroom. She wants mirrors that have an area of 24 square units. Which mirrors can she choose? Choose the **two** correct answers.

A. B. C. D.

On your Own:

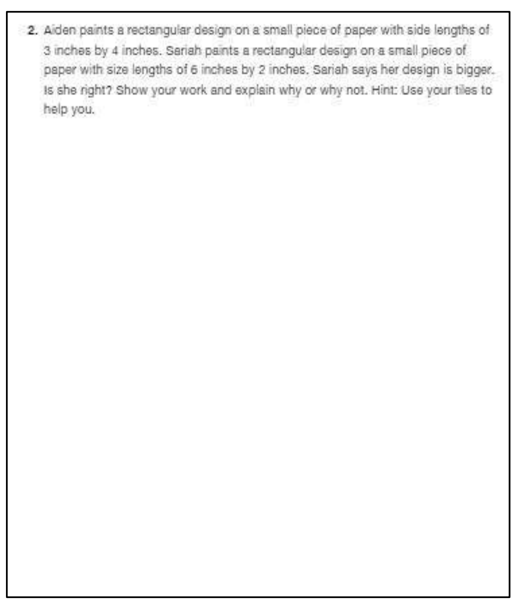
Now you can explore comparing areas of rectangles on your own!



Name:___________________________ G3 U3 Lesson 4 - Independent Work

I will decompose and recompose rectangles to compare areas.

1. Find **4 different rectangles** that have an area of **10 square inches**. Use your square inch tiles to help you. Draw the rectangles and **label the side lengths.**



2. Aiden paints a rectangular design on a small piece of paper with side lengths of 3 inches by 4 inches. Sariah paints a rectangular design on a small piece of paper with size lengths of 6 inches by 2 inches. Sariah says her design is bigger. Is she right? Show your work and explain why or why not. Hint: Use your tiles to help you.

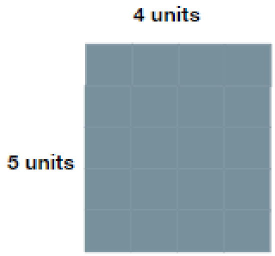
Name:____ G3 U3 Lesson 4 - Let's Try It

1. Use **12 square inch tiles** to compose **6 rectangles** with different side lengths. Draw the rectangles on the grid paper. **Label the side lengths**.

Use skip counting to find all the ways to make a rectangle with an area of 12 square units using whole numbers. Ask: Can I skip count by _____ to get to 12? How many times? Draw the area models to represent each rectangle.

1 2 3 4 5 6 7 8 9 10 11 12

2. What is the area of this 5 units by 4 units rectangle?



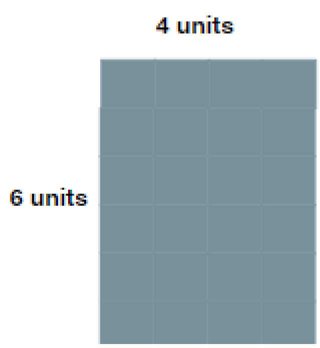
Area = ____________________ square units

Using whole numbers, what is a rectangle you can make that has different side lengths and the same area as the rectangle above? Draw the rectangle and label the side lengths. You can use tiles to help you.

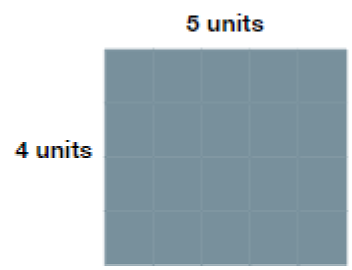
Area = ____________________ square units

3. Maria needs to choose mirrors for her bathroom. She wants mirrors that have an area of 24 square units. Which mirrors can she choose? Choose the **two** correct answers.

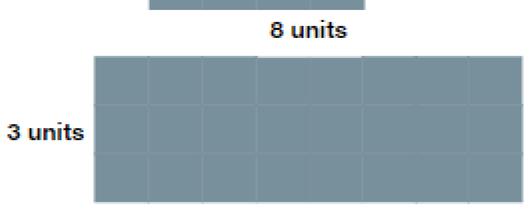
A.



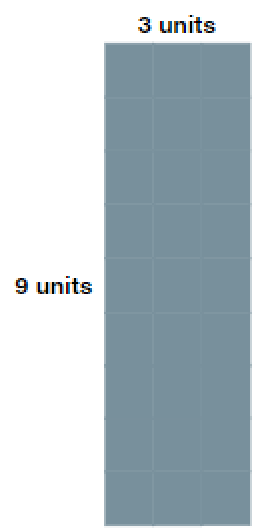
B.



C.



D.



Which mirror has the largest area? ________________________________

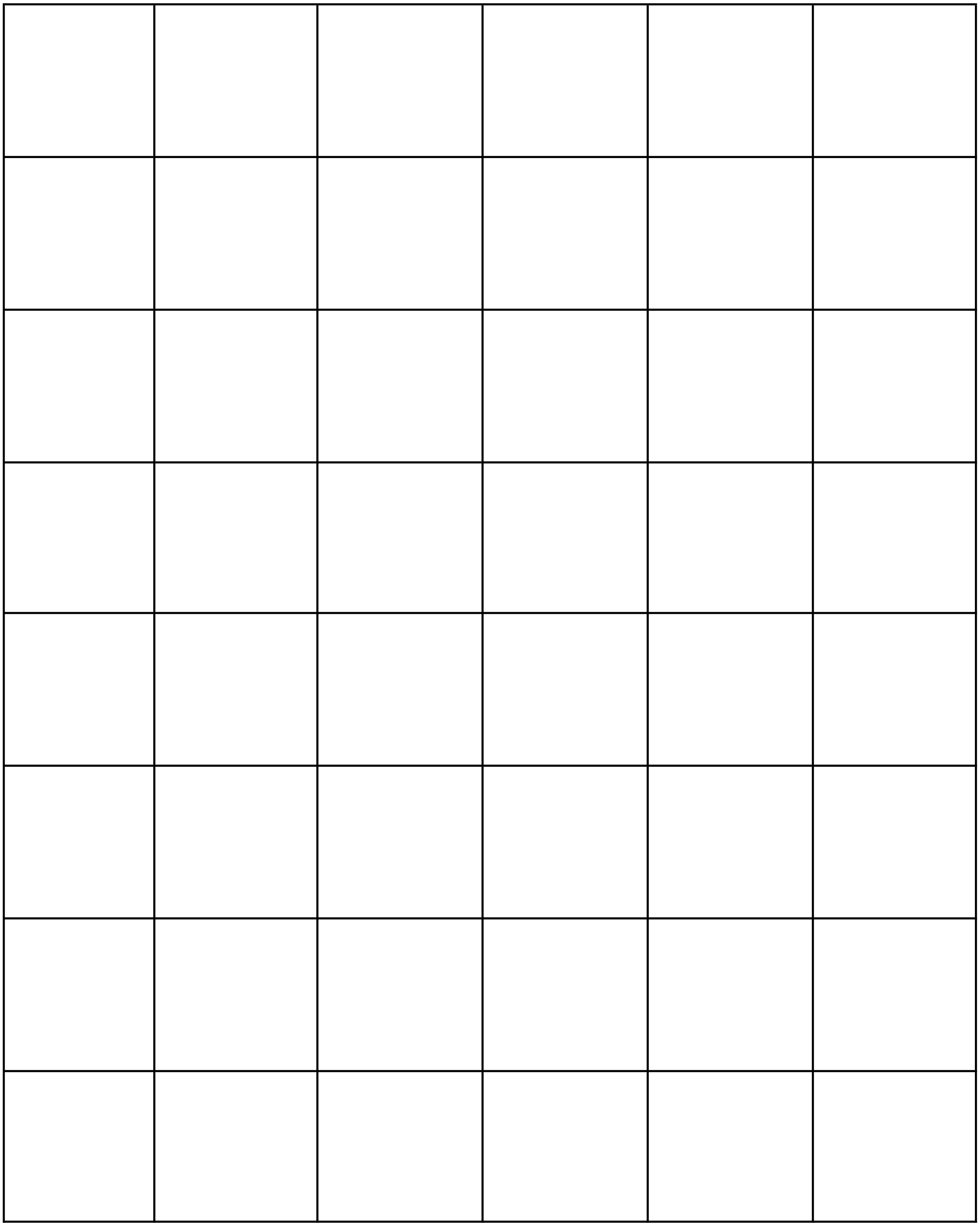
Which mirror has the smallest area? ________________________________

Which mirrors have the same area? ________________________________

1. Find **4 different rectangles** that have an area of **10 square inches**. Use your square inch tiles to help you. Draw the rectangles and **label the side lengths.**

2. Aiden paints a rectangular design on a small piece of paper with side lengths of 3 inches by 4 inches. Sariah paints a rectangular design on a small piece of paper with size lengths of 6 inches by 2 inches. Sariah says her design is bigger. Is she right? Show your work and explain why or why not. Hint: Use your tiles to help you.

Square Inch Tiles

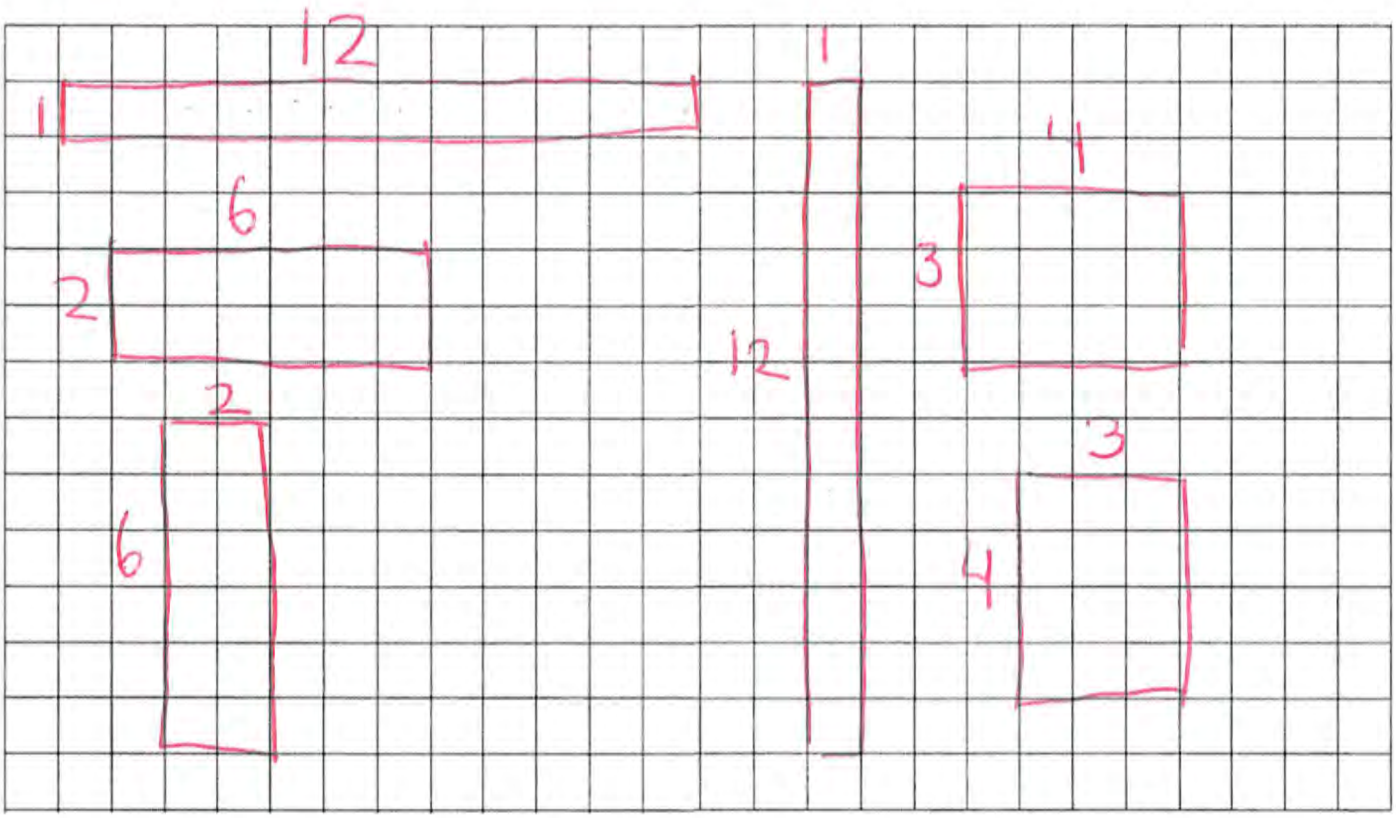


Grid Paper

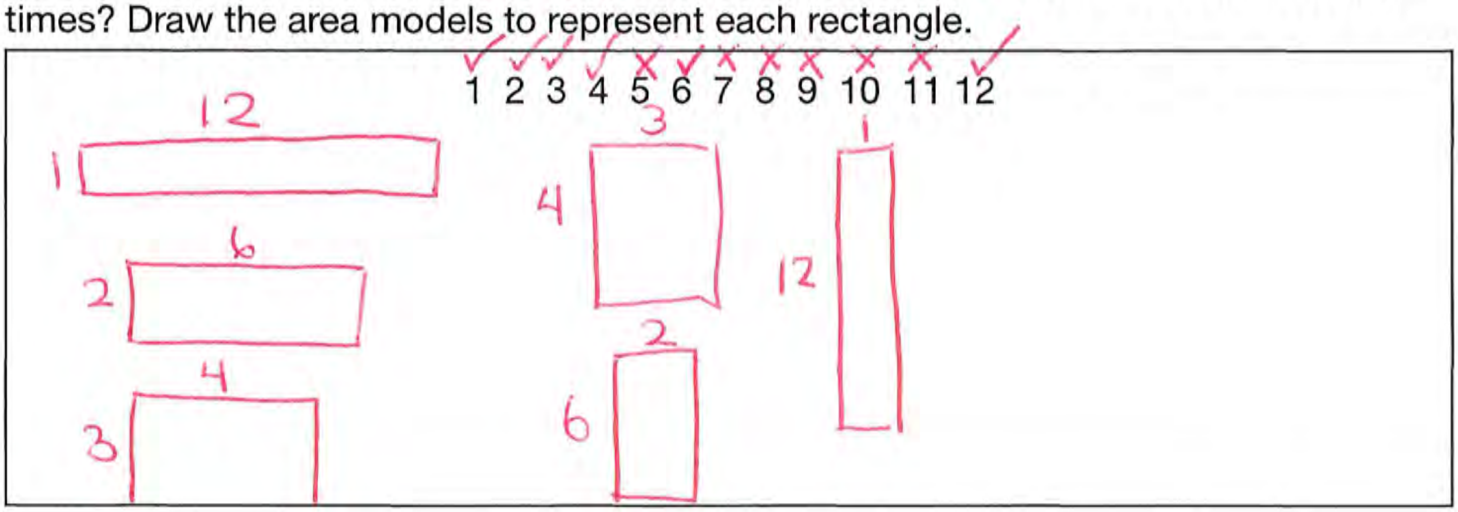
Name:______________________________

We will decompose and recompose rectangles to compare areas.

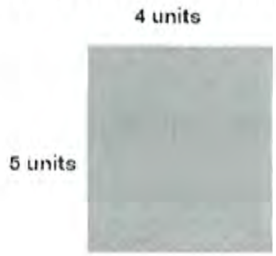
1. Use **12 square inch tiles** to compose **6 rectangles** with different side lengths. Draw the rectangles on the grid paper. **Label the side lengths**.



Use skip counting to find all the ways to make a rectangle with an area of 12 square units using whole numbers. Ask: Can I skip count by _____ to get to 12? How many times? Draw the area models to represent each rectangle.



2. What is the area of this 5 units by 4 units rectangle?



5 rows of 4
$5 \times 4 = 20$

Area = 20 square units

Using whole numbers, what is a rectangle you can make that has different side lengths and the same area as the rectangle above? Draw the rectangle and label the side lengths. You can use tiles to help you.

10

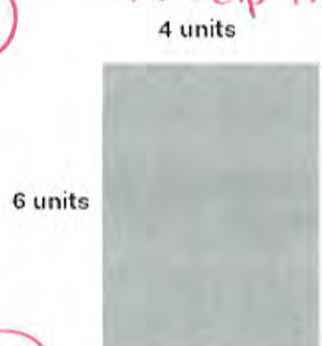
2 $\boxed{2 \times 10 = 20}$

Area = 20 square units

3. Maria needs to choose mirrors for her bathroom. She wants mirrors that have an area of 24 square units. Which mirrors can she choose? Choose the **two** correct answers.

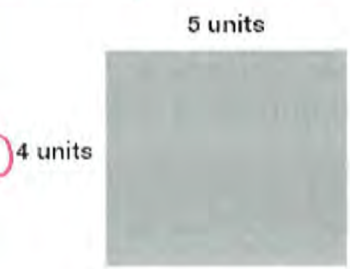
*Note: Students can draw on grid paper to help them find the area!

A.



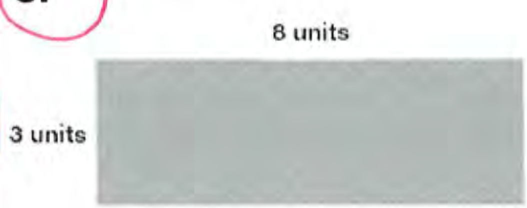
$6 \times 4 = 24$

~~**B.**~~



$4 \times 5 = 20$

C.



$3 \times 8 = 24$

~~**D.**~~

$9 \times 3 = 27$

Which mirror has the largest area? Figure D

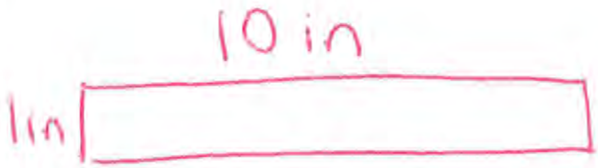
Which mirror has the smallest area? Figure B

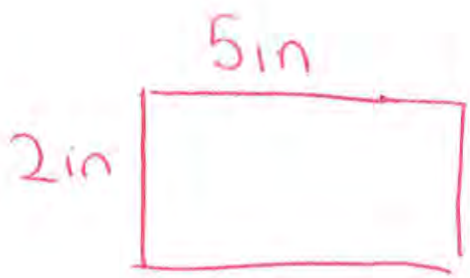
Which mirrors have the same area? Figures A and C

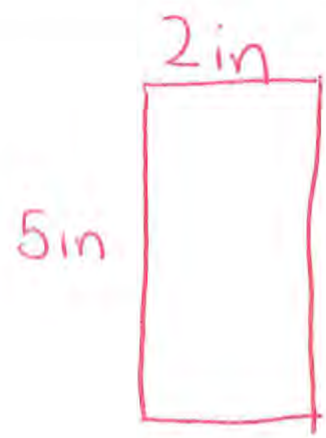
Name:__________________________________ G3 U3 Lesson 4 - Independent Work

I will decompose and recompose rectangles to compare areas.

1. Find **4 different rectangles** that have an area of **10 square inches**. Use your square inch tiles to help you. Draw the rectangles and **label the side lengths.**







2. Aiden paints a rectangular design on a small piece of paper with side lengths of 3 inches by 4 inches. Sariah paints a rectangular design on a small piece of paper with size lengths of 6 inches by 2 inches. Sariah says her design is bigger. Is she right? Show your work and explain why or why not. Hint: Use your tiles to help you. Note: Encourage them to draw a picture.

3 rows of 4
$3 \times 4 = 12$

6 rows of 2
$6 \times 2 = 12$

Sariah is wrong. The areas are both 12 square inches so they are the same size.

G3 U3 Lesson 5

Solve for the unknown side length of a rectangle when given one side length and the area

G3 U3 Lesson 5 - Students will solve for the unknown side length of a rectangle when given one side length and the area

Materials:

- 12 inch tiles per partner group
- cm grid paper for every student

Warm Welcome (Slide 1): Tutor choice.

Let's Review (Slide 2-3): We've been making a lot of progress with area! We know that area is the amount of space a flat (or 2-dimensional) shape takes up! We've learned about three ways to find the area of a 2-dimensional shape. Who remembers the three ways?

- We can count the tiles to find the area.
- We can skip count the rows or columns
- We can find the area when we multiply the side lengths!

And, yesterday we learned that rectangles can have the same area but different side lengths. For example, all of these rectangles have an area of 12 square units…this one has an area of 12 square units, so does this one, etc (*point as you go*). But they don't all look the same! This first rectangle has a side length of 6 units and a side length of 2 units (*point to rectangle on the left*) and the area is…(*count the total boxes*) 1, 2, 3…12 square units! But this rectangle (*point to rectangle on the right),* has a side length of 12 units and a side length of 1 unit and the area is still 12. Count it with me…1, 2, 3…12!

Frame the Learning/Connect to Prior Learning (Slide 4): So today, we're going to put it all together and we will solve for the unknown side length of a rectangle when given one side length and the area. What does unknown mean? Something we don't know it. Correct! That means that today, we will be given the area, we will be given one side length, and we will need to solve for the missing, or unknown, side length!

Let's Talk (Slide 5): Let's warm up our brains with a problem we learned about yesterday. So, Mr. Green is planting a rectangular garden that has an area of 12 square yards. What are the side lengths of different rectangles he could use for his garden? Work with your partner and use your tiles if they are helpful to you. Are these square tiles the same size as square yards? No! They're much smaller! That's right, these are much smaller but it's a model of what Mr. Green's garden could look like. Find some different options he could have for his garden that has an area of what? 12 square yards!

Let students work together with 12 tiles to make rectangles. Let them share some options of different rectangles that have an area of 12 square units.

Great job finding rectangles that have different side lengths with an area of 12 square units. Now we are going to solve problems where we know the area, but I am also going to give you one side length and you need to figure out the missing side length! For example, if I told you his garden was 12 square yards and one side length was 3 yards, you would have to solve for the missing side length. It will be fun! Let's try it.

Let's Think (Slide 6): Look at this rectangle. This rectangle has a missing side! I see that one side is 5 inches, we don't know the other side but look we do know the total area, it's 35 square inches! Hmm, so let me show you want we can do to find the missing side length…notice that we're going to use what we already know but we're going to work backwards.

Those are all great ideas! So, we know that this side length is 5 (*point*), which means that there are 5 rows with some tiles in each row and when we count them all up, we'll have a total area of 35 square inches.

$5 \times \_\_ = 35$

$35 \div 5 = \_\_\_$

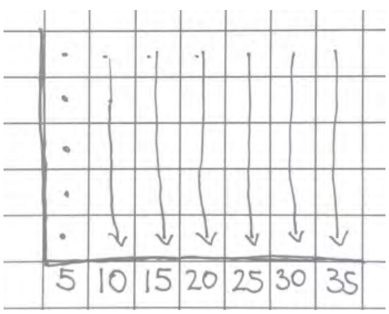
Well, that means that 5 groups of something will make 35. We can write an equation to help us represent that. Look, we know there's a total of 35 tiles so we know that 5 times SOMETHING will give us 35. So, think 5 x __ = 35. Or, another way to think about that is 35 divided by 5 will give us that unknown. So 35 ÷ 5= ___.

$5 \times \underline{7} = 35$

$35 \div 5 = \underline{7}$

One way we can figure out this unknown is to skip count by 5s, the side length we know, until we get to 35 and then see how many times we skip counted by 5s. Let's try it …5, 10, 15, 20, 25, 30, 35. Now we have to go back and count how many fingers we put up to get to 35. We counted by 5s how many times? SEVEN times to get to 35. So the other side length must be 7 inches because 5 x 7 = 35. So, 35 divided by 5 = 7.

Let's Think (Slide 7): And look, if I didn't know how to skip count I could use my grid paper. I can draw a side length that has 5 tiles. That represents my 5 rows. Then I can count by 5s until I get to 35. Be careful because the 5 represents 5 rows, but it also means we have 5 tiles in each column so we will skip count by 5s while tracing each column (*trace your finger down each column as you count by 5s).* Count with me… 5, 10, 15, 20, 25, 30, 35!



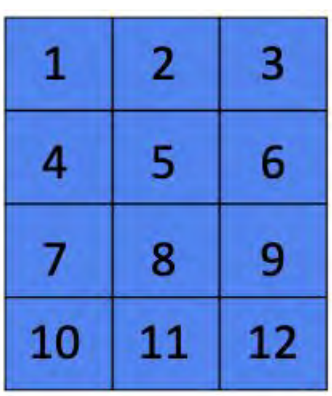
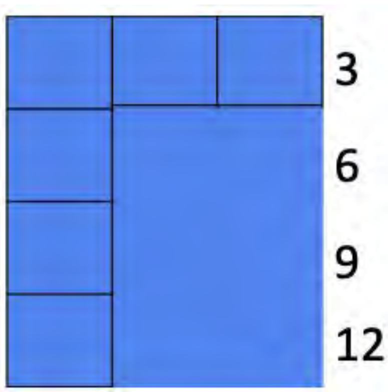
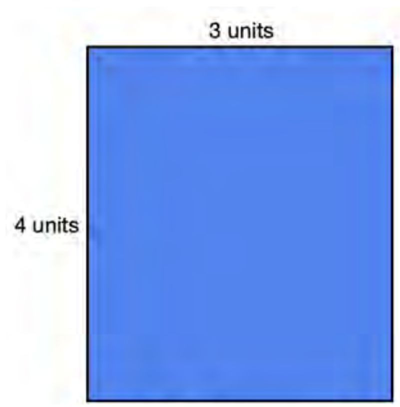
Now I can draw my other side length. I can see that I have 5 rows of 7. So, my missing side length must be 7 inches. The last thing I need to do is go back and check my work, I need to go back through and make sure that 5 groups of 7 is 35. I can do this a few ways…I can skip count, I can multiply, I can go back and count my area model. Pick a way to check our work and make sure that a rectangle with a side length of 5 and 7 makes 35.

Let's Try it (Slides 9-10): Now let's work on finding the unknown side length of rectangles. Remember the one side length we know tells us how many rows or how many columns, and we can skip count by that number until we get to our total area. This will help us find the missing side length. We are going to work on the first page step-by-step.

WARM WELCOME

Let's Review:

How can we find the area of a rectangle?

We can fill the inside and **count all** the square tiles.	We can **skip count** the equal groups.	We can **multiply** the side lengths.
		 **4 x 3 = 12 square units**

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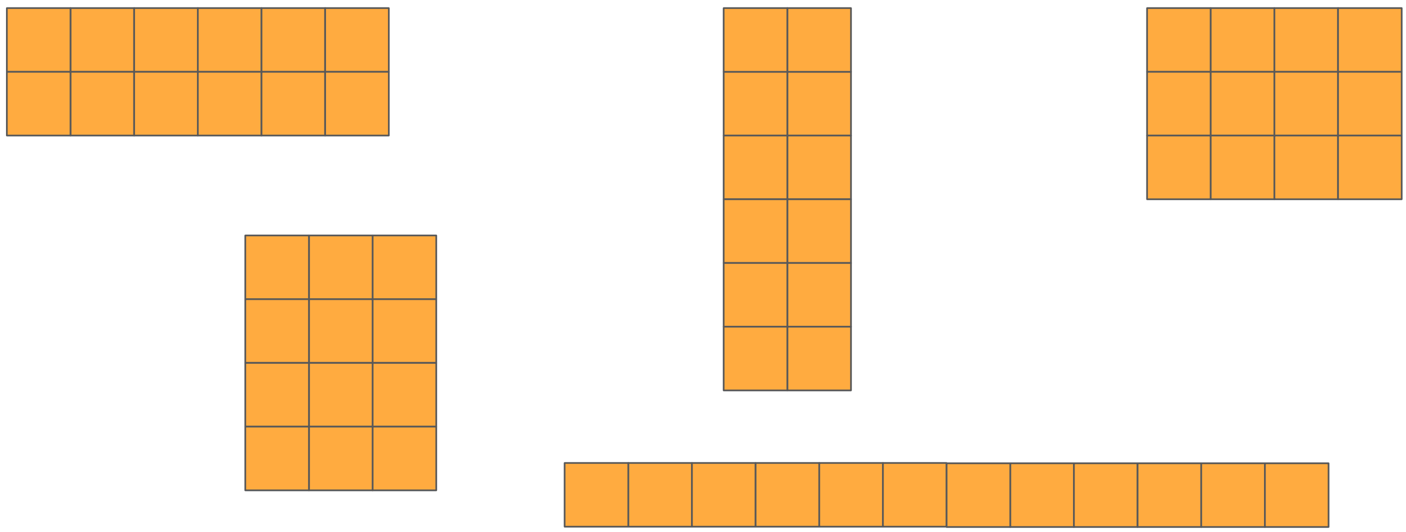
Let's Review:

Rectangles can have the same area but different side lengths.



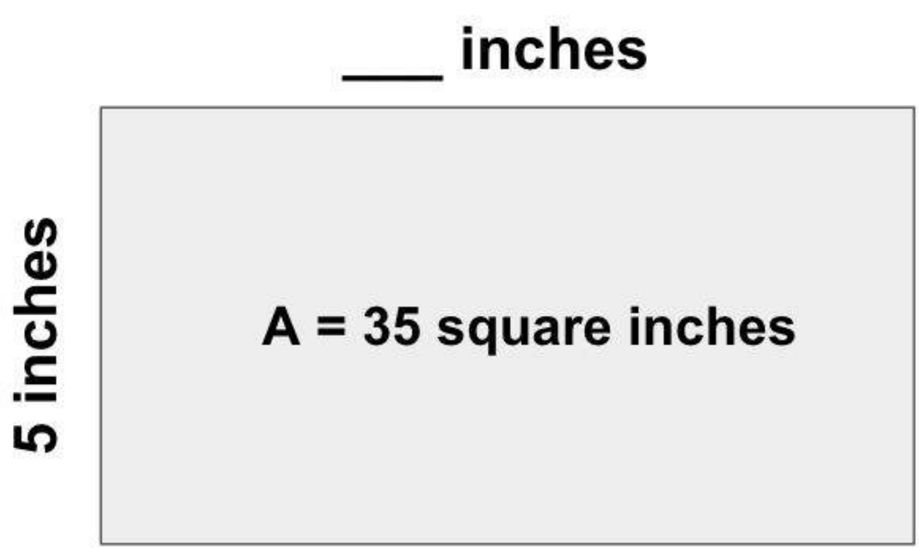
Today we will find the **unknown side length** of a rectangle.

Let's Talk:

Mr. Green is planting a rectangular garden that has an area of 12 square yards. What are the side lengths of different rectangles he could use for his garden?

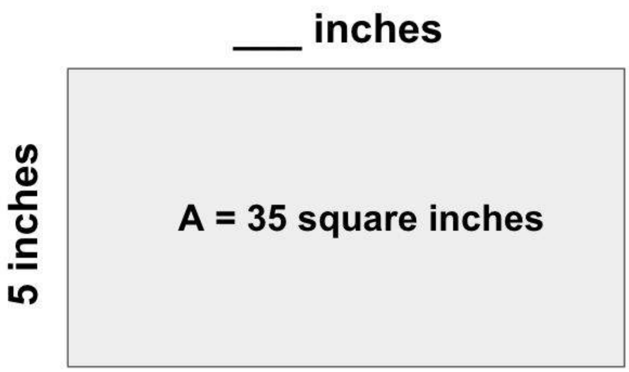
Let's Think:

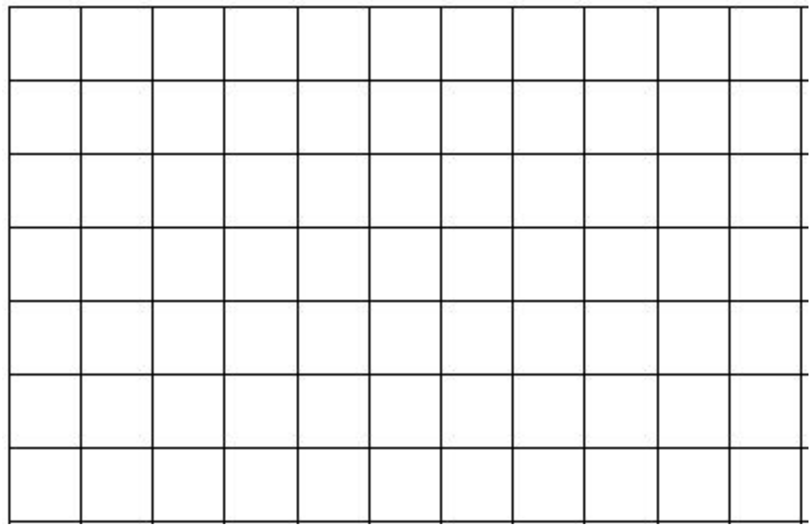
How can we find the missing side length?



Let's Think:

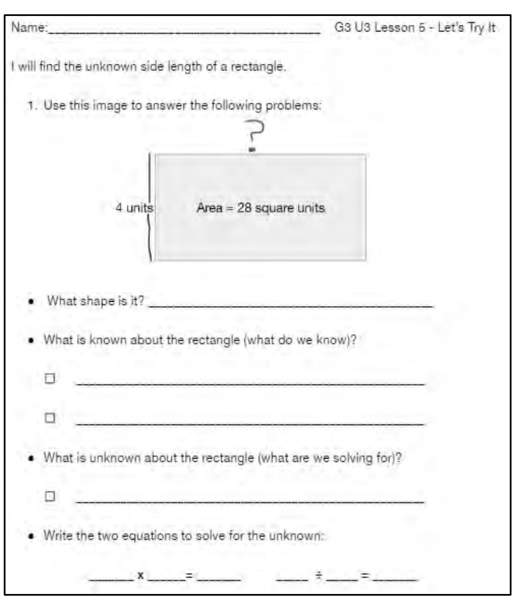
How can we find the missing side length?





Let's Try It:

Let's explore answering questions about area and the unknown side length together.



Name:_________________________ G3 U3 Lesson 5 - Let's Try It

I will find the unknown side length of a rectangle.

1. Use this image to answer the following problems:

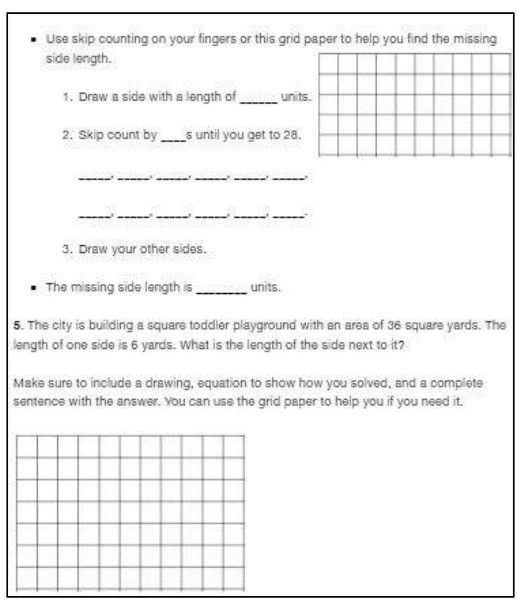
?

4 units

Area = 28 square units

- What shape is it? _______________________
- What is known about the rectangle (what do we know)?
  - ☐ _______________________
  - ☐ _______________________
- What is unknown about the rectangle (what are we solving for)?
  - ☐ _______________________
- Write the two equations to solve for the unknown:

_____ x _____ = _____ _____ ÷ _____ = _____



- Use skip counting on your fingers or this grid paper to help you find the missing side length.
  1. Draw a side with a length of _____ units.
  2. Skip count by ____s until you get to 28.

  _____, _____, _____, _____, _____, _____,

  _____, _____, _____, _____, _____, _____,

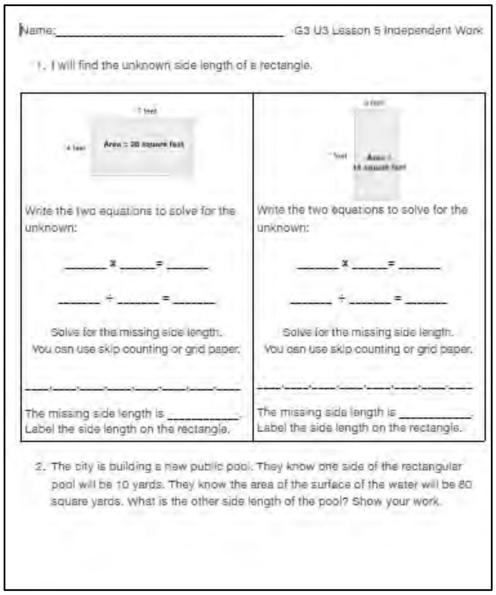
  3. Draw your other sides.
- The missing side length is _______ units.

5. The city is building a square toddler playground with an area of 36 square yards. The length of one side is 6 yards. What is the length of the side next to it?

Make sure to include a drawing, equation to show how you solved, and a complete sentence with the answer. You can use the grid paper to help you if you need it.

On your Own:

Now you can explore answering questions about area and the unknown side length your own!



Name:_______________________________ G3 U3 Lesson 5 Independent Work

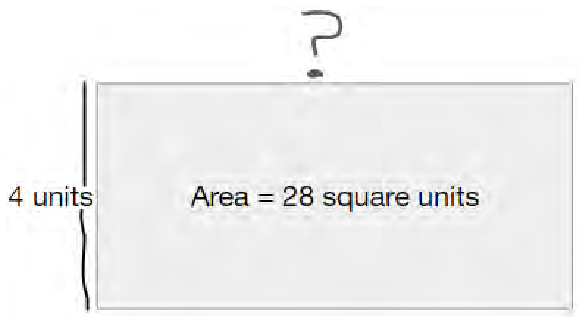
1. I will find the unknown side length of a rectangle.

Write the two equations to solve for the unknown:	Write the two equations to solve for the unknown:
______ x ______ = ______	______ x ______ = ______
______ ÷ ______ = ______	______ ÷ ______ = ______
Solve for the missing side length. You can use skip counting or grid paper.	Solve for the missing side length. You can use skip counting or grid paper.
The missing side length is __________. Label the side length on the rectangle.	The missing side length is __________. Label the side length on the rectangle.

2. The city is building a new public pool. They know one side of the rectangular pool will be 10 yards. They know the area of the surface of the water will be 80 square yards. What is the other side length of the pool? Show your work.

Name:____ G3 U3 Lesson 5 - Let's Try It

Use this image to answer the following problems:



1. What shape is it? ______________________________

2. What is **known** about the rectangle (what do we know)?

   ☐ ____

   ☐ ____

3. What is **unknown** about the rectangle (what are we solving for)?

   ☐ ____

4. Write the two equations to solve for the unknown:

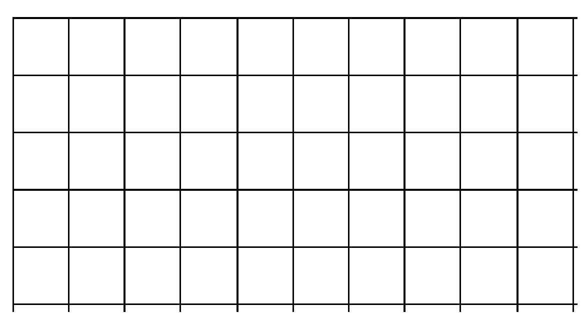
   _______ x ______= _______ _____ ÷ _____ = _______

5. Use skip counting on your fingers or this grid paper to help you find the missing side length.

   a. Draw a side with a length of ______ units.

   b. Skip count by ____s until you get to 28.

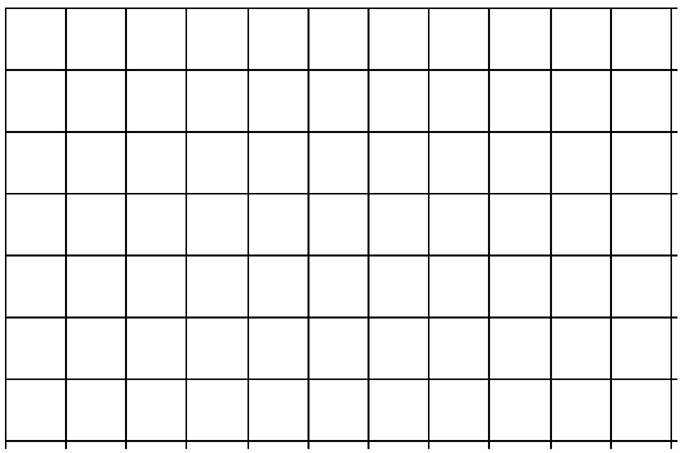
_____, _____, _____, _____, _____, _____, _____

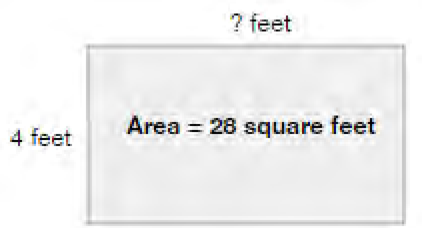
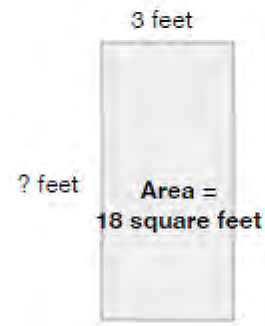


6. The missing side length is ________ units.

7. The city is building a square toddler playground with an area of 36 square yards. The length of one side is 6 yards. What is the length of the side next to it?

Make sure to include a drawing, equation to show how you solved, and a complete sentence with the answer. You can use the grid paper to help you if you need it.

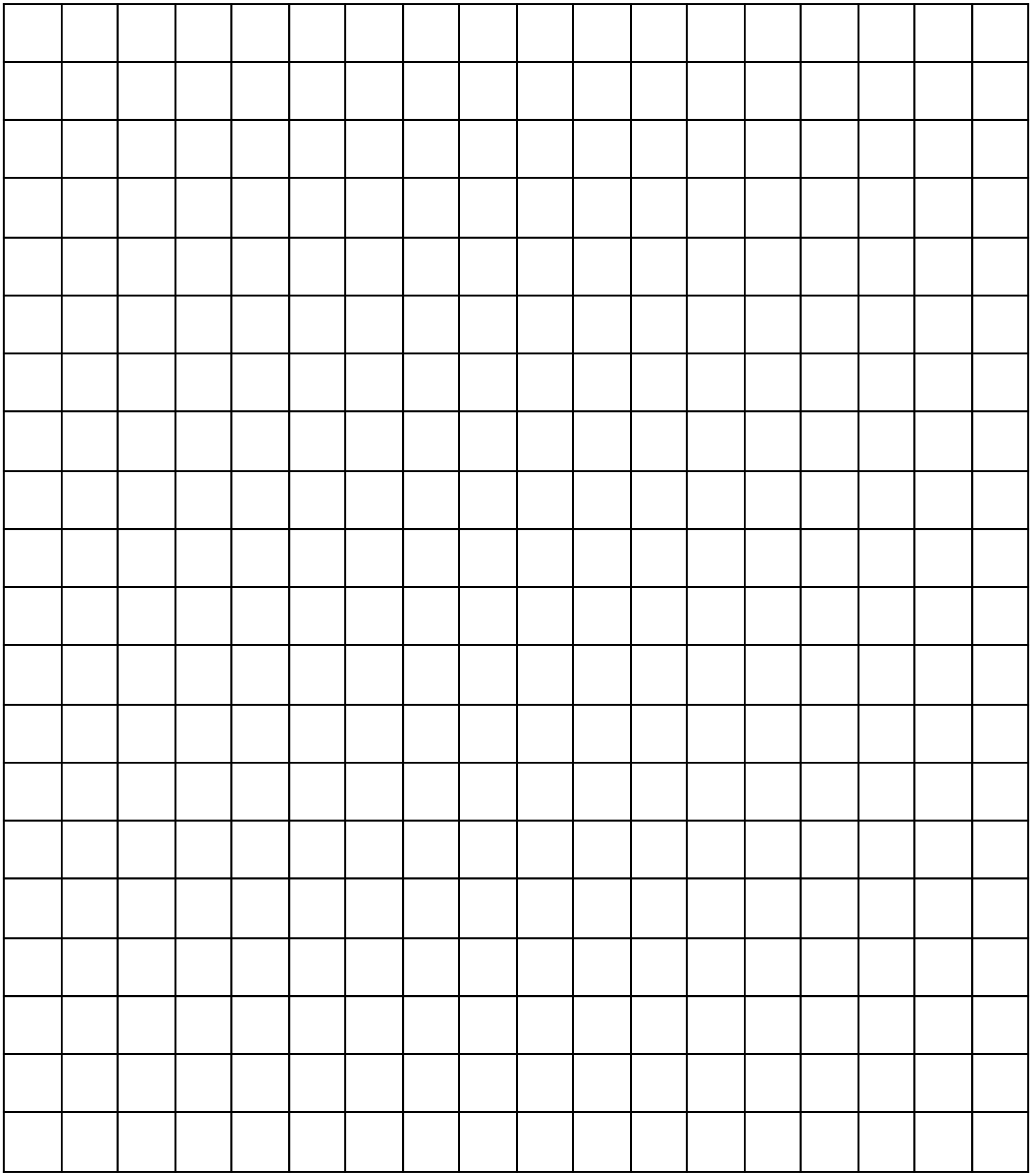


Find the unknown side length of a rectangle.	Find the unknown side length of a rectangle.
 1. Write the two equations to solve for the unknown: _______ x ______= _______ _______ ÷ _______ = _______ 2. Solve for the missing side length. You can use skip counting or grid paper. ____,____,____,____,____,____,____ 3. The missing side length is ___________. 4. Label the side length on the rectangle.	 1. Write the two equations to solve for the unknown: _______ x ______= _______ _______ ÷ _______ = _______ 2. Solve for the missing side length. You can use skip counting or grid paper. ____,____,____,____,____,____ 3. The missing side length is ___________. 4. Label the side length on the rectangle.

The city is building a new public pool. They know one side of the rectangular pool will be 10 yards. They know the area of the surface of the water will be 80 square yards. What is the other side length of the pool? Show your work.

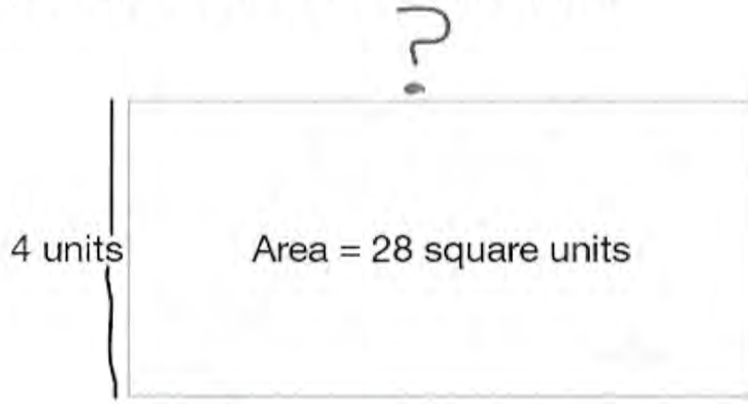
Square Inch Tiles

Square Centimeter Tiles



I will find the unknown side length of a rectangle.

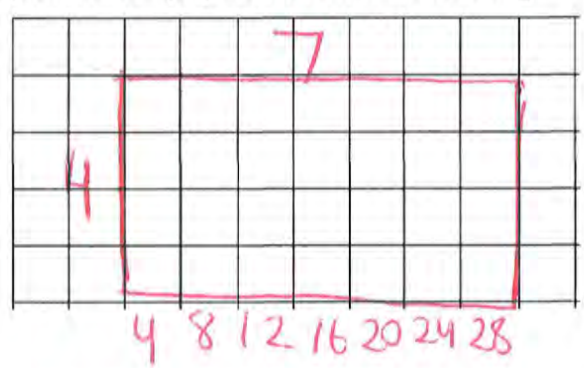
1. Use this image to answer the following problems:



- What shape is it? rectangle
- What is known about the rectangle (what do we know)?
  - ☐ Area= 28 square units
  - ☐ 1 side length= 4 units
- What is unknown about the rectangle (what are we solving for)?
  - ☐ The other side length
- Write the two equations to solve for the unknown:

4 x _____ = 28 28 ÷ 4 = _____

- Use skip counting on your fingers or this grid paper to help you find the missing side length.



1. Draw a side with a length of __4__ units.
2. Skip count by __4__s until you get to 28.

__4__ (1), __8__ (2), __12__ (3), __16__ (4), __20__ (5), __24__ (6),
__28__ (7), ____, ____, ____, ____, ____.

7 groups of 4 = 28

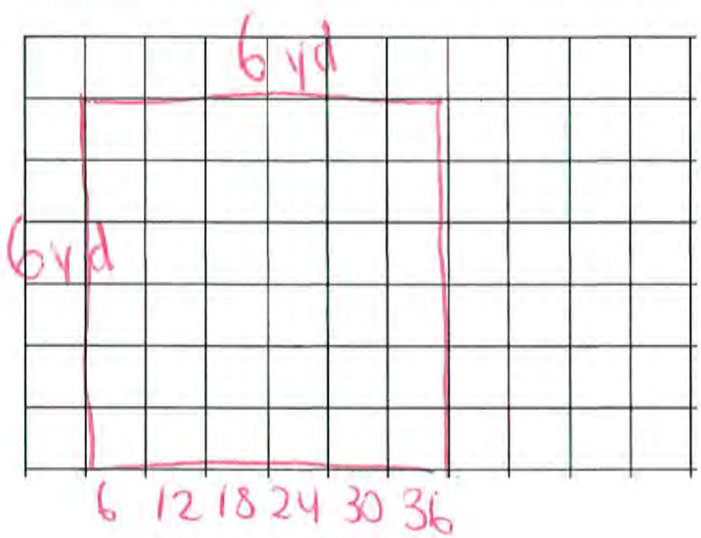
note: count how many times you skip counted by 7.

3. Draw your other sides.

- The missing side length is __7__ units.

5. The city is building a square toddler playground with an area of 36 square yards. The length of one side is 6 yards. What is the length of the side next to it?

Make sure to include a drawing, equation to show how you solved, and a complete sentence with the answer. You can use the grid paper to help you if you need it.



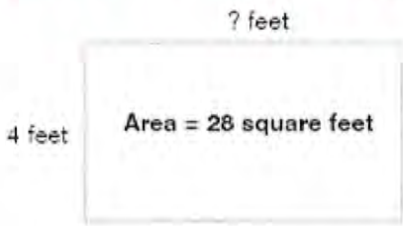
$6 \times \underline{6} = 36$

The length of the other side is 6 yds.

Name:______________________________ G3 U3 Lesson 5 Independent Work

1. I will find the unknown side length of a rectangle.

Note: They can draw it on grid paper if it helps.



Write the two equations to solve for the unknown:

4 x ______ = 28

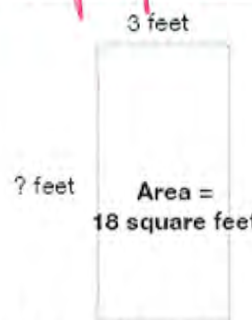
28 ÷ 4 = ______

Solve for the missing side length.
You can use skip counting or grid paper.

4, 8, 12, 16, 20, 24, 28, ______

1 2 3 4 5 6 7

The missing side length is 7 ft.
Label the side length on the rectangle.



Write the two equations to solve for the unknown:

3 x ______ = 18

18 ÷ 3 = ______

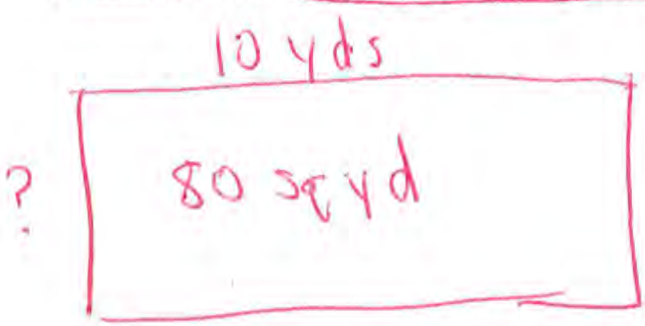
Solve for the missing side length.
You can use skip counting or grid paper.

3, 6, 9, 12, 15, 18, ______, ______

1 2 3 4 5 6

The missing side length is 6 ft.
Label the side length on the rectangle.

2. The city is building a new public pool. They know one side of the rectangular pool will be 10 yards. They know the area of the surface of the water will be 80 square yards. What is the other side length of the pool? Show your work.



10x ___ = 80

10x8 = 80

The other side length of the pool is 8 yards.

G3 U3 Lesson 6

Decompose rectangles using tiles

G3 U3 Lesson 6 - Students will decompose rectangles using tiles

Materials:

- Cut-able inch and centimeter tiles (only use the inch tiles for this lesson) for every student

Welcome (Slide 1): Tutor choice.

Let's Review (Slide 2): We've learned so much about area! We know that area is the amount of space a two-dimensional shape takes up and we're all becoming experts on calculating the area of rectangles.

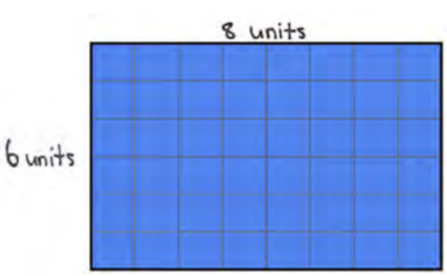
Frame the Learning/Connect to Prior Learning (Slide 3): Today we will decompose rectangles using tiling. Decompose means to break apart. So far in this unit, we have been finding the area of rectangles with smaller side lengths, like 2 inches, 3 inches, 4 inches, and 5 inches. Today we will look at rectangles with larger side lengths and think about how we can break the rectangle into two smaller rectangles to help us find the area.

Let's Talk (Slide 5): Let's look at this rectangle. **What do you notice and wonder?** Possible Student Answers, Key Points:

- It has a lot of squares! The lengths are longer than the numbers we've been working on in the previous lessons.
- I see 2 different color rectangles–the bigger blue one and the smaller yellow one. The big rectangle is cut into 2 smaller rectangles.
- I see a line dividing the rectangle into two parts.
- I see 3 different rectangles. The largest one, the blue one, and the yellow one.
- I wonder why the line is there cutting the rectangle.
- I wonder if the area changes if you cut a rectangle into smaller pieces.

Thank you for sharing! Those are so many great observations! You're right that this rectangle is cut into two smaller rectangles–the yellow rectangle and the bigger blue rectangle. Today we're going to answer many of those questions and explore many of those wonderings.

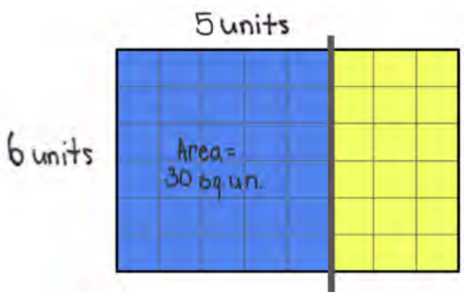
Let's Think (Slide 6): Before we look, let's review, how can we find the area of the big rectangle before it's cut into two smaller rectangles? We can count the squares. We can skip count the rows or columns. We can multiply the side lengths.



Right, we can count the squares or we can skip count the rows or columns, or we can multiply the side lengths. When there is a rectangle with longer side lengths, it will take us a REALLY long time to count all the squares. It might be hard for us to skip count or multiply the side lengths since it's harder to skip count with larger numbers. For example, in this rectangle, what are the side lengths? 6 units and 8 units! We might not know how to skip count by 6s or by 8s. If we try to multiply the side lengths, we might not know the product, or answer, for 6 x 8.

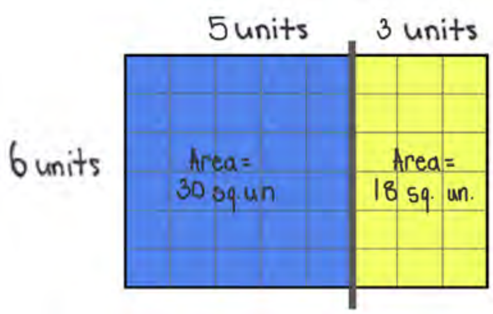
So, to make it easier to find the area, we can decompose or break apart the rectangle. If I want to decompose, or break apart this rectangle I can break apart the rows OR I can break apart the columns (*drag finger across and up and down*). One strategy I can use to decompose my rectangle is to think about a number I know how to skip count easily by.

Let's Think (Slide 7): This is the same rectangle, we still have 6 rows and 8 columns, but I'm going to think of it as two smaller rectangles to make it easier to find the area. Instead of thinking of this side length as 8, I'm going to break it into 5 and 3 (*count both sides to show how it's split*). The reason I'm breaking it into 5 and 3 is because I know how to count by fives really well so that can help me find the area.



Let's look at the blue rectangle first. What is the side length that shows how many rows we have? It's still 6 units (*label*). And, what is the side length of the blue rectangle that shows how many tiles in each row, or how many columns we have *(slide finger across the top horizontal side for the blue rectangle only)*? 5 units! Right, 5 units (*label)*.

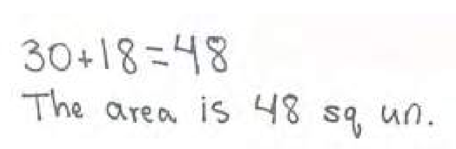
So, if we want to find the area of JUST the blue rectangle, we can multiply the side lengths. There are 6 rows of 5. And, 6 rows of 5 is the same as 6x5. That means we can count by 5 six times. Let's do that together. 5, 10, 15, 20, 25, 30, 35. *(Slide finger across each row as you skip count by 5s).* The area of the blue, or first rectangle is? 30 square units.



But, we're not done yet! We still need to find the area of the yellow rectangle. The first thing we need to do is find the side lengths. So, what is the side length that shows how many rows are in the yellow rectangle? It's 6 because there are 6 rows. Also opposite sides of a rectangle are equal. That's right. We know opposite sides of a rectangle are equal. If I know this side is 6 units, then I know this side (*trace opposite side length with finger),* is also 6 units. And, where is the side length for the yellow rectangle that shows how many tiles are in each row or how many columns there are? Let's count…1, 2, 3 units! So, this side length is? 3 units!

So we have 6 rows of 3. And, 6 rows of 3 is the same as what multiplication expression? 6 x 3. I can skip count by 3 six times. Let's do that together (*slide finger along each row as you count)...*3, 6, 9, 12, 15, 18. Or, if I don't know how to skip count, I can just add. So, the area of the yellow rectangle is? 18 square units!

Do you see how that was a little easier? Splitting the 8 into 5 and 3 gave us easier numbers to work with. So, now we know the area of the blue rectangle, and the area of the yellow rectangle. But, we aren't done yet. We have to find the area, or how many squares, of the blue and yellow together! What can we do with the 30 squares (*point)* and the 18 squares *(point)*? Put them together! Yes, we need to put them together*.* When we combine numbers, or bring them together, we are adding them!



So, the blue rectangle and the yellow rectangle together is…48 squares! I That means that the area is… 48 SQUARE units!

We just found the area of a rectangle with longer side lengths by decomposing, or breaking apart the rectangle. Great work!

Let's Think (Slide 8): Look at these 3 rectangles, **what do you notice?** Possible Student Answers, Key Points:
- They're all the same rectangle but they're just broken up differently.
- There are a lot of ways to break apart rectangles.
- You can break apart the number of columns or you can break apart the number or rows.

- You can break it down the middle and then you only need to find the area of one rectangle.
- A and C, the columns are broken up.
- B the rows are broken up.
- No matter how you break the bigger rectangle, the area will still be 48 square units.

Terrific thinking! You are exactly right that it doesn't matter how you decompose or break apart the rectangle. You can do it in a place that makes sense to you and then add the two areas back together to find the area of the bigger rectangle. You can decompose, or break apart the columns *(point to the first rectangle)*. You can decompose or break apart the rows *(point to the second rectangle)*. You can break it down the middle *(point to the third rectangle)*! Mathematicians get to be flexible and YOU get to choose what makes sense to YOU!

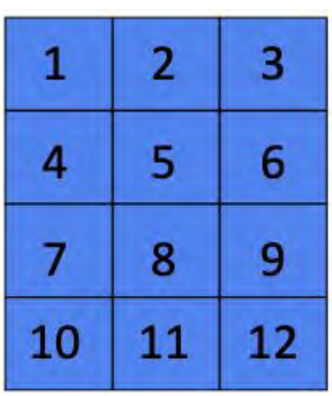
Let's Try it (Slides 9-10): Now let's work on decomposing the rectangles with tiling. Remember, decomposing rectangles is one way to help us find the area of larger rectangles. It doesn't matter where you decompose the rectangle as long as you use all the rows and columns. We are going to work on the first page step-by-step.

WARM WELCOME

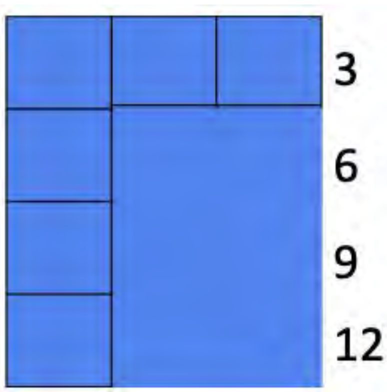
Let's Review:

AREA is the amount of space a 2-D shape takes up.

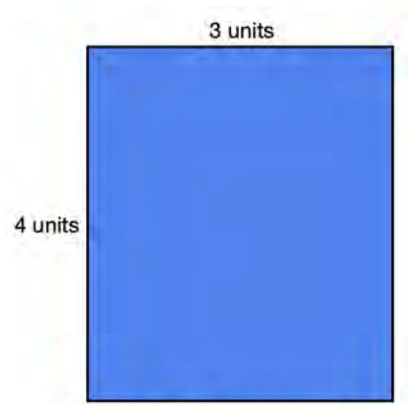
We can fill the inside and **count all** the square tiles.



We can **skip count** the equal groups.



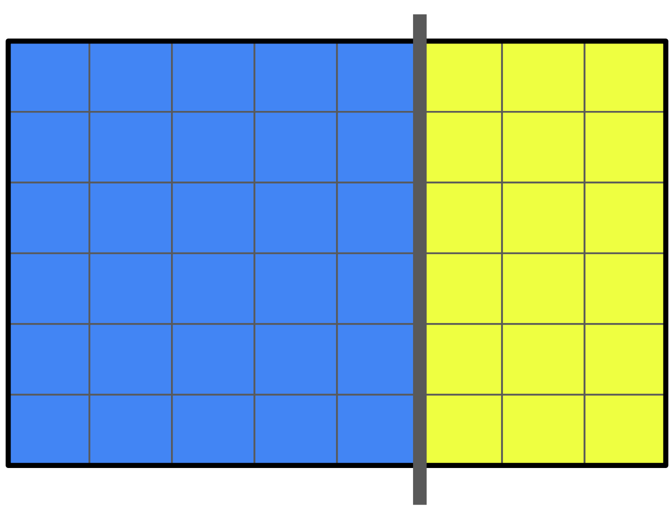
We can **multiply** the side lengths.



4 x 3 = 12 square units

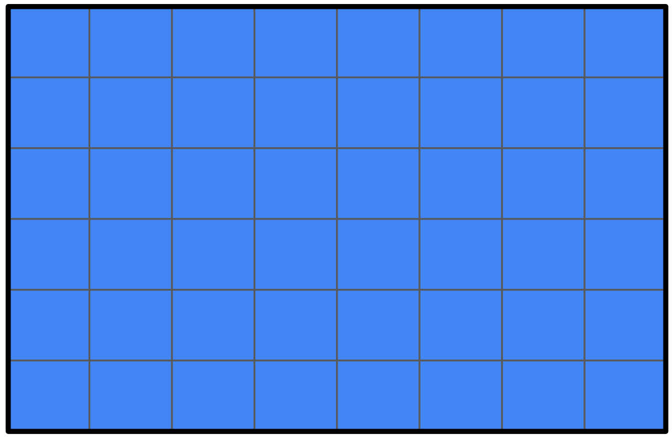
Today we <u>decompose</u> rectangles with square tiles.

Let's Talk: What do you notice and wonder about this rectangle?



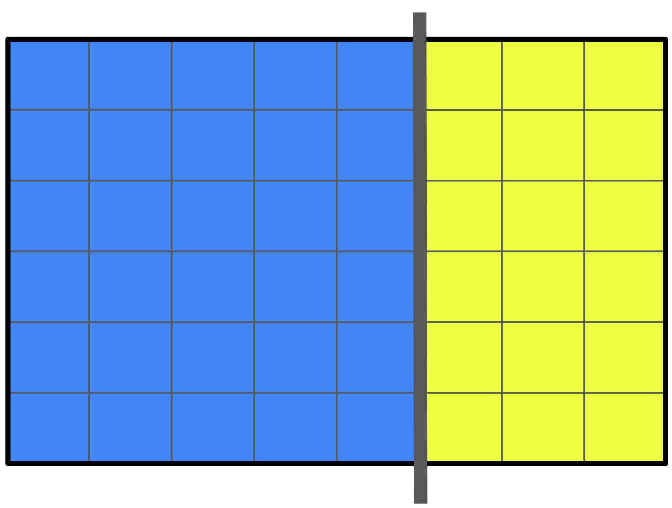
Let's Think:

How can we find the area of this large rectangle?



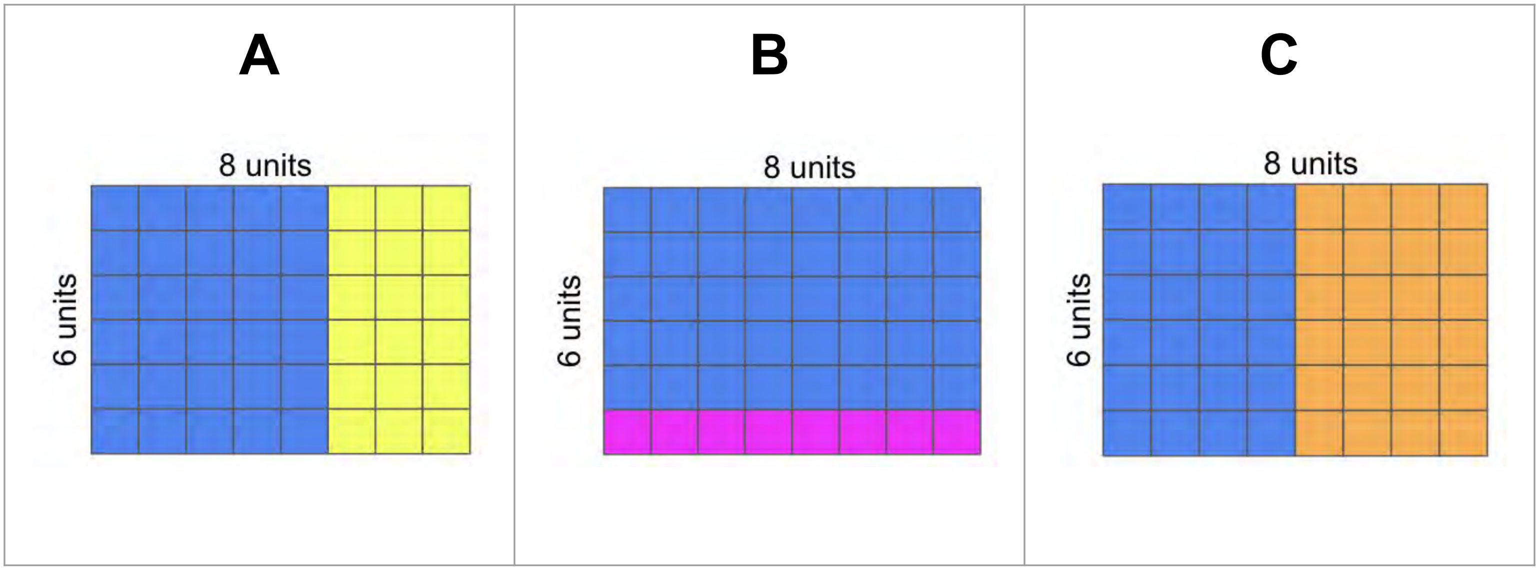
Let's Think:

How can we find the area of this large rectangle?



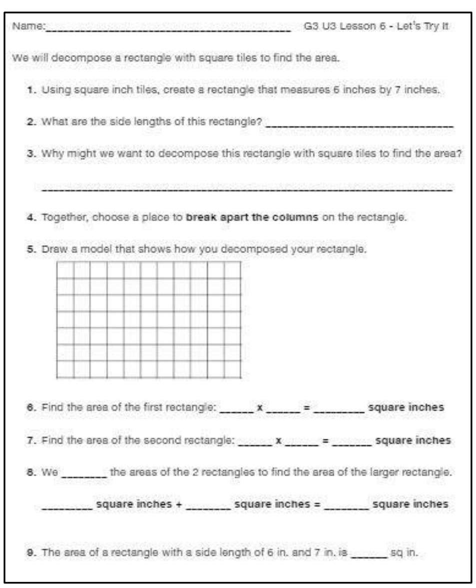
Let's Think:

What do you notice?



Let's Try It:

Let's explore decomposing rectangles with tiles together!



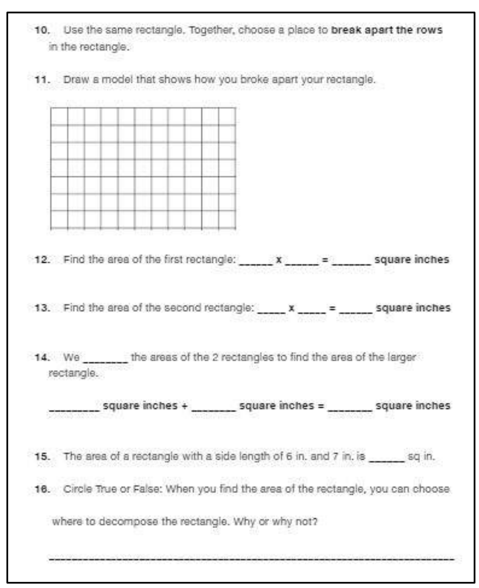
Name:____ G3 U3 Lesson 6 - Let's Try It

We will decompose a rectangle with square tiles to find the area.

1. Using square inch tiles, create a rectangle that measures 6 inches by 7 inches.
2. What are the side lengths of this rectangle? ______________________________
3. Why might we want to decompose this rectangle with square tiles to find the area?

   ____
4. Together, choose a place to **break apart the columns** on the rectangle.
5. Draw a model that shows how you decomposed your rectangle.
6. Find the area of the first rectangle: _____ x _____ = _______ **square inches**
7. Find the area of the second rectangle: _____ x _____ = ______ **square inches**
8. We _______ the areas of the 2 rectangles to find the area of the larger rectangle.

   _______ square inches + _______ square inches = _______ square inches
9. The area of a rectangle with a side length of 6 in. and 7 in. is _____ sq in.



10. Use the same rectangle. Together, choose a place to **break apart the rows** in the rectangle.
11. Draw a model that shows how you broke apart your rectangle.
12. Find the area of the first rectangle: _____ x _____ = _____ **square inches**
13. Find the area of the second rectangle: _____ x _____ = _____ **square inches**
14. We _______ the areas of the 2 rectangles to find the area of the larger rectangle.

    _______ square inches + _______ square inches = _______ square inches
15. The area of a rectangle with a side length of 6 in. and 7 in. is _____ sq in.
16. Circle True or False: When you find the area of the rectangle, you can choose

    where to decompose the rectangle. Why or why not?

    ____

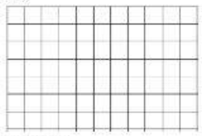
On your Own:

Now you can decompose rectangles with tiles on your own!

Name:______________________________ G3 U3 Lesson 6 - Independent Work

I will decompose a rectangle with square tiles to find the area.

1. Use your tiles. Create a rectangle that has side lengths of 6 inches by 8 inches.
2. Decompose or break apart your rectangle into 2 smaller rectangles.
3. Draw your rectangle on the grid paper. Draw a line where you chose to decompose the rectangle.



4. Find the area of the first rectangle.

   _____ x _____ = ______ square inches

5. Find the area of the second rectangle.

   _____ x _____ = ______ square inches

6. Add the areas of the smaller rectangles together.

   _____ square inches + _______ square inches = ________ square inches

7. A rectangle with side lengths of 6 inches by 8 inches has an area of ________ square inches.
8. 6 inches x 8 inches = _______ square inches.

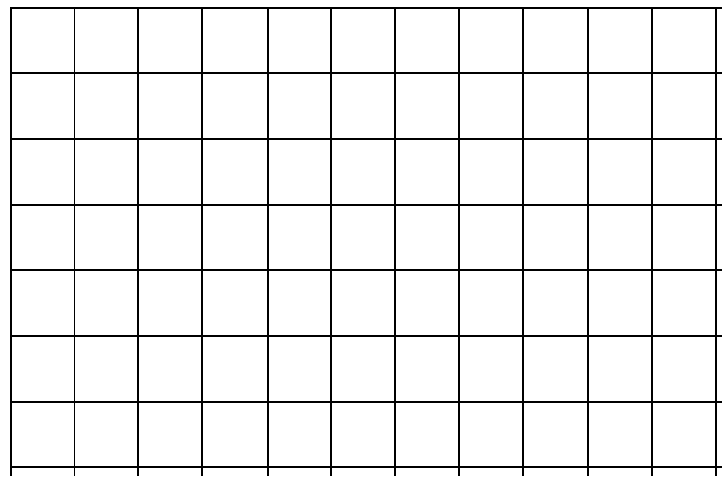
Name:____

1. Using square inch tiles, create a rectangle that measures 6 inches by 7 inches.

2. What are the side lengths of this rectangle? _______________________________

3. Together, choose a place to **break apart the columns** on the rectangle.

4. Draw a model that shows how you decomposed your rectangle.



5. Find the area of the first rectangle: ______ **x** ______ **=** _________ **square inches**

6. Find the area of the second rectangle: ______ **x** ______ **=** _______ **square inches**

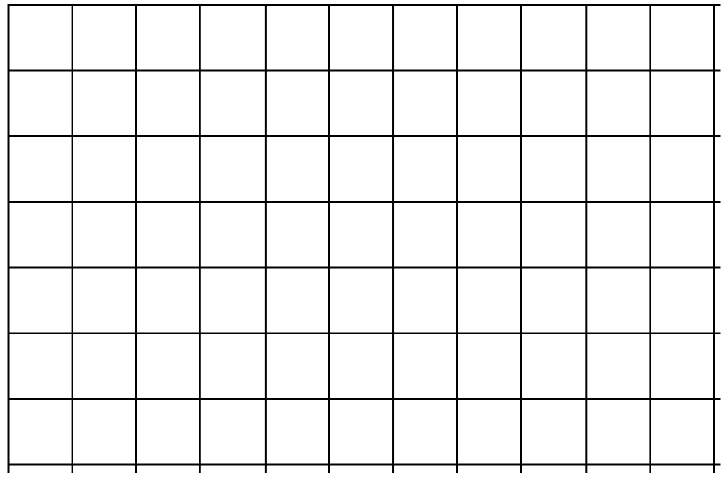
7. We add the areas of the 2 rectangles to find the area of the larger rectangle.

   _________ **square inches +** ________ **square inches =** ________ **square inches**

8. The area of a rectangle with a side length of 6 in. and 7 in. is ______ sq in.

9. Use the same rectangle. Together, choose a place to **break apart the rows** in the rectangle.

10. Draw a model that shows how you broke apart your rectangle.



11. Find the area of the first rectangle: ______ **x** ______ **=** _______ **square inches**

12. Find the area of the second rectangle: _____ **x** _____ **=** ______ **square inches**

13. We add the areas of the 2 rectangles to find the area of the larger rectangle.

_________ **square inches +** ________ **square inches =** ________ **square inches**

14. The area of a rectangle with a side length of 6 in. and 7 in. is ______ sq in.

15. True or False: When you find the area of the rectangle, you can choose where to decompose the rectangle. Why or why not?

____

____

____

____

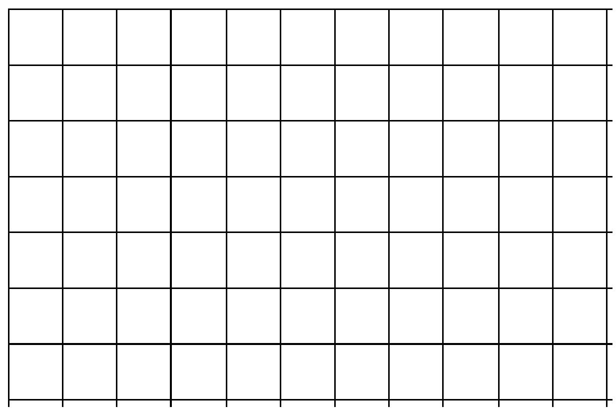
Name: ______________________________ G3 U3 Lesson 6 - Independent Work

I will decompose a rectangle with square tiles to find the area.

1. Use your tiles. Create a rectangle that has side lengths of 6 inches by 8 inches.

2. Decompose or break apart your rectangle into 2 smaller rectangles.

3. Draw your rectangle on the grid paper. Draw a line where you chose to decompose the rectangle.



4. Find the area of the first rectangle.

______ x ______ = _______ square inches

5. Find the area of the second rectangle.

______ x ______ = _______ square inches

6. Add the areas of the smaller rectangles together.

______ square inches + ________ square inches = _________ square inches

7. A rectangle with side lengths of 6 inches by 8 inches has an area of _________ square inches.

8. 6 inches x 8 inches = ________ square inches.

Square Inch Tiles

Square Centimeter Tiles

Name:____________________________________ G3 U3 Lesson 6 - Let's Try It

We will decompose a rectangle with square tiles to find the area.

1. Using square inch tiles, create a rectangle that measures 6 inches by 7 inches.

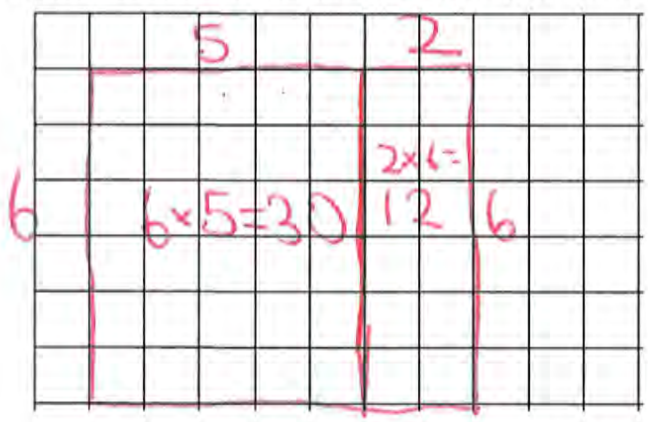
2. What are the side lengths of this rectangle? 6 inches and 7 inches

3. Why might we want to decompose this rectangle with square tiles to find the area?

It is a large rectangle. 6×7 is hard to multiply.

4. Together, choose a place to **break apart the columns** on the rectangle.

5. Draw a model that shows how you decomposed your rectangle.



6. Find the area of the first rectangle: 6 x 5 = 30 **square inches**

7. Find the area of the second rectangle: 2 x 6 = 12 **square inches**

8. We add the areas of the 2 rectangles to find the area of the larger rectangle.

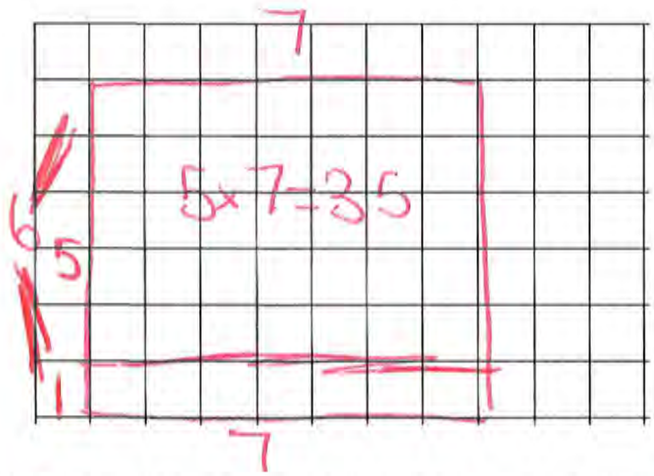
30 **square inches +** 12 **square inches =** 42 **square inches**

30+10=40 40+2=42

9. The area of a rectangle with a side length of 6 in. and 7 in. is 42 sq in.

10. Use the same rectangle. Together, choose a place to **break apart the rows** in the rectangle.

11. Draw a model that shows how you broke apart your rectangle.



12. Find the area of the first rectangle: 5 x 7 = 35 **square inches**

13. Find the area of the second rectangle: 1 x 7 = 7 **square inches**

14. We add the areas of the 2 rectangles to find the area of the larger rectangle.

35 **square inches +** 7 **square inches =** 42 **square inches**

35+7
5 2
40+2=42

15. The area of a rectangle with a side length of 6 in. and 7 in. is 42 sq in.

16. Circle True or False: When you find the area of the rectangle, you can choose where to decompose the rectangle. Why or why not?

You are still finding the total number of squares.

Name:______________________________ G3 U3 Lesson 6 - Independent Work

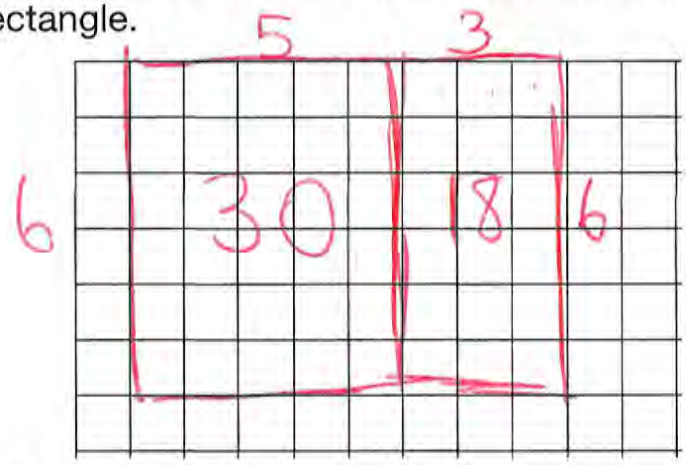
I will decompose a rectangle with square tiles to find the area.

1. Use your tiles. Create a rectangle that has side lengths of 6 inches by 8 inches.

2. Decompose or break apart your rectangle into 2 smaller rectangles.

3. Draw your rectangle on the grid paper. Draw a line where you chose to decompose the rectangle.

(example)



4. Find the area of the first rectangle.

6 x 5 = 30 square inches

5. Find the area of the second rectangle.

6 x 3 = 18 square inches

3, 6, 9, 12, 15, 18

6. Add the areas of the smaller rectangles together.

30 square inches + 18 square inches = 48 square inches

7. A rectangle with side lengths of 6 inches by 8 inches has an area of 48 square inches.

8. 6 inches x 8 inches = 48 square inches.

G3 U3 Lesson 7

Apply the distributive strategy to find the total area of a large rectangle by adding two products

G3 U3 Lesson 7 - Students will apply the distributive strategy to find the total area of a large rectangle by adding two products

Materials:

- Grid paper for every student

Welcome (Slide 1): Tutor choice.

Let's Review (Slide 2): We've been learning about area for a while now, we know that area is the amount of space a 2-D shape takes up. Yesterday, we explored how we can break apart rectangles into smaller rectangles to make them easier to work with. As mathematicians, we can be flexible and find ways that are more efficient for our brains. To remind you, yesterday we looked at a big rectangle that had side lengths of 6 units and 8 units. We learned that we can decompose, or cut, rectangles vertically, so cut the columns like A and C or we can cut the rows like B.

- With Rectangle A, we cut 8 columns into what? 5 and 3! That's right, so we thought of it as 6 groups of 5 and then 6 groups of 3 rather than 6 groups of 8 (*point to parts of the rectangle*).
- With Rectangle B, we cut 6 rows into what? 5 and 1! That's right, so we thought of it as 5 groups of 8 and 1 group of 8 rather than 6 groups of 8 (*point to parts of the rectangle*).
- And finally, with Rectangle C, we cut it right down the middle. We cut 8 columns into what? 4 and 4! That's right, so we thought of it as 6 groups of 4 and another 6 groups of 4 (*point to parts of the rectangle*).

Frame the Learning/Connect to Prior Learning (Slide 3): Today we will apply the distributive strategy to find the total area of a large rectangle by adding two products. Distributive strategy is the mathematical term for the strategy we started to use yesterday. It's when we decompose, or break apart, two rectangles , find the areas of each rectangle, then add those areas, or those products to find the total area of the BIG rectangle. Let me show you.

Let's Talk (Slide 4): I want to start by looking closely at two rectangles and some math that goes with them. Look closely at these two rectangles on this slide. **What's the same? What's different?** I know there's a lot of information on this slide so I'll give you a few minutes to collect your thoughts before we share. Possible Student Answers, Key Points:

- Both rectangles are decomposed into a blue rectangle and a pink rectangle.
- They both have the same side lengths, 6 and 8.
- They both broke 8 into 5 and then 3.
- The side lengths are labeled.
- They both add 30 + 18 = 48 at the bottom of the rectangles.
- They have an area of 48 square units.
- The first rectangle has all of the squares, so we could count them to find the area. But, the second one only has the side lengths filled in.
- The second rectangle has the equation written in the smaller rectangles.
- The second rectangle has (6 x 5) + (6x3) on the top of the equations

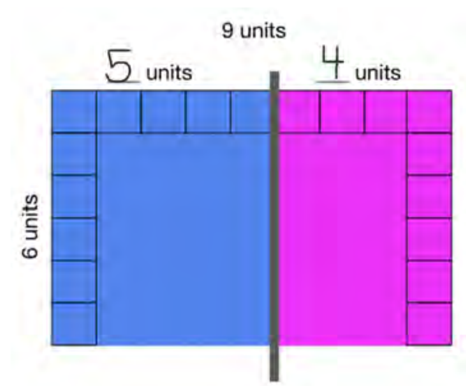
Those are great observations! One difference is that the first image has square tiles filled in and the second image has most of the tiles erased. The other difference is the second image as another part to the equation filled in (*point to the bolded part of the equation under the second image).* Today when we use the distributive strategy, we will learn how to write the equations that match the model to help us solve for the area.

Let's Think (Slide 5): Here we have a BIG, BIG rectangle. We want to find the area of the BIG rectangle (*trace side lengths*). Instead of using one of our three strategies to find an area, we're going to come back to what we did yesterday with cutting, or decomposing, BIG rectangles into smaller rectangles. Before we get to that, let's find the side lengths of this BIG rectangle.

What is the vertical side length, or how many rows does this rectangle have? 6 rows! That's right, so the length of this side is 6 units. And let's look across the top, how many columns are there? Remember, we're looking at the WHOLE side length (*drag finger across blue and pink*). 9 columns! That's right, so the length of this side is 9 units. So the dimensions or the BIG rectangle are 6 units by 9 units, so to find the area of the BIG rectangle, we can multiply the side lengths, what would that be? 6 x 9!

Just like we learned yesterday, we can multiply 6 x 9 but that can be a tricky multiplication equation to solve. Instead, we can decompose the rectangle into two smaller rectangles, let me show you.

Let's Think (Slide 6): Look at this! This is the same rectangle, we still have 6 rows and 9 columns (*count to show*). But, we decomposed it into smaller rectangles! Now, we have the blue rectangle and the pink rectangle which make up the BIG rectangle. On this one, we cut the columns.



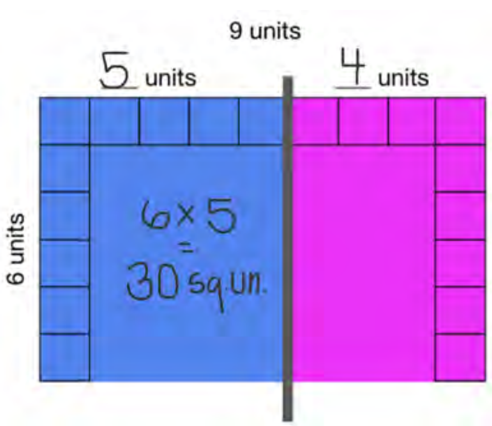
We decomposed the 9 units (*slide finger across)* into two smaller units *(point to the 2 blanks under the 9 on the image)*. How did I decompose the 9 units? Into 5 units and 4 units! That's right, we cut the 9 columns into 5 columns and then 4 columns (label on slide). So instead of looking at this rectangle as 6 groups of 9, now we're looking at it as 6 groups of 5 AND 6 groups of 5 (*point to rectangles*). We haven't done anything new yet. What we're learning today is how to show this with equations, watch me.

$$6 \times 9 = 6 \times (\underline{5} + \underline{4})$$

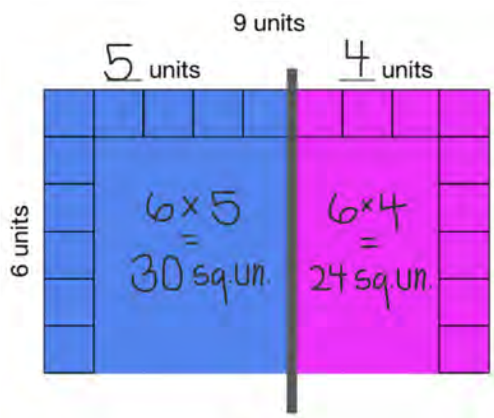
We can show this in our equation…6 x 9, which is the area of the BIG rectangle, is equal to, 6 groups of 5 AND 6 groups of 4 (*point to the 5 units and 4 units that you labeled on the rectangle).* So, we replaced the 9 with 5 and 4 because we split it into pieces. So, in our equation we can rename the 9 (*point to 9 in the equation)* as what? 5 + 4!

$$6 \times 9 = 6 \times (\overset{9}{\underline{5} + \underline{4}})$$

Before we keep going, these are called parenthesis (*point)*. Let's say it together…parenthesis! Parenthesis in math show how we group numbers. We are grouping the 5 and 4 together because it makes 9, and 9 is the side length of the larger rectangle. Let's look closely at this equation, 6 times 9 EQUALS 6 times 5 plus 4. Equal means THE SAME AS. So, 6 times 9 is THE SAME AS 6 times 5 plus 4 because 5 plus 4 equals 9*.* When we write the equation like this, we are showing that we decomposed, or broke up, the 9 into 5 units and 4 units.



Let's work together to find the area of each of the smaller rectangles. How can we calculate the area? Multiply the side lengths! Let's work with the blue rectangle first. We see 6 rows of 5 (point to sides) which is the same as 6 groups of 5, which is the same as 6 x 5. Take a moment to solve. So, what is the area of this rectangle? The area of the rectangle is 30 square units! That means if we filled in all the rows and columns and counted the squares, there would be how many squares? 30 squares. The product is 30. Remember product means the answer when we multiply.



Now let's find the area of the pink rectangle. What's the most efficient way to find the area? Multiply the side lengths! We didn't cut the rows, so we still have 6 rows but now we have 6 rows of 4 (*cover blue rectangle with hand*). So, the pink rectangle has 6 rows of 4, which is the same as what multiplication expression? 6x4. Take a moment to solve. What is the area of the pink rectangle? The area of the rectangle is 24 square units! That means if we filled in all the rows and columns and counted the squares, there would be how many squares? 24 squares. Let's write the multiplication equation inside the pink rectangle.

$$6 \times 9 = 6 \times (5 + 4)$$

$$6 \times 9 = (6 \times 5) \quad (6 \times 4)$$

Now let's show what we did with our equations, this is the new part! So, we found the area of the blue rectangle by distributing the 6 rows to the 5 columns. We found the area of the pink rectangle by distributing the 6 rows to the 4 columns. Let's write that as an equation to show how we found the area of the smaller rectangles. For the blue rectangle we multiplied what? 6 x 5.

$$6 \times 9 = 6 \times (5 + 4)$$

$$6 \times 9 = (6 \times 5) + (6 \times 4)$$

For the pink rectangle we multiplied what? 6 x 4! We write the expressions in parentheses to show how we grouped the numbers. It shows that we have two smaller rectangles. Which color is represented by the (6x5) in the rectangle? Blue! Which color is represented by the (6x4) in the rectangle? Pink!
Now what do we do with the areas of the two rectangles? We put them together! We combine them! Correct! We take the two products, or the two areas, and combine them. When we combine we add, so we will place a + sign in between the two multiplication expressions.

Note: Placing the addition sign after you write the equations can help students identify they are taking the blue and pink areas and adding them together. Often teachers will write the equations in order from left to right but this can help students connect the equation to the image.

$$6 \times 9 = 6 \times (5 + 4)$$

$$6 \times 9 = (6 \times 5) + (6 \times 4)$$

$$6 \times 9 = 30 \qquad 24$$

So, what is (6x5) or 6 rows of 5 tiles? We already solved that for the blue rectangles…30 square units! Let's draw an arrow to show that this 30 came from the (6x5) which is the blue rectangle.

And, what is the product of (6x4) or 6 rows of 4 tiles? We already solved that for the pink rectangle. 24 square units! Let's draw an arrow to show that this 24 came from the (6x4) which is the pink rectangle.

We are adding the 30 squares (*point to the blue rectangle)* with the 24 squares *(point to the the pink rectangle).* We will write a plus sign between the 30 sq. units and the 24 sq. units.

Take a moment to solve 30 + 24, you can use paper or do it in your head. What is it? 54! Right, so the total area of the large rectangle is 54 square units!

$$6 \times 9 = 6 \times (5 + 4)$$

$$6 \times 9 = (6 \times 5) + (6 \times 4)$$

$$6 \times 9 = 30 + 24$$

$$6 \times 9 = 54$$

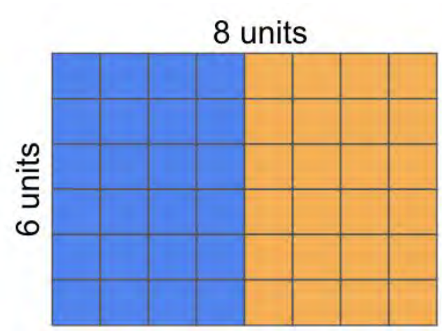
If we filled the rectangle in with squares and counted them there would be how many square units? 54 square units! So now we know 6 x 9 = 54. This strategy is called the distributive strategy. We took the 6 rows and distributed them to the 5 columns and to the 4 columns. We found the area of the large rectangle by finding the products of the sides of the smaller rectangles and adding them together.

Let's Try it (Slides 7-8): Now let's work on using the distributive strategy to find the area of a larger rectangle. Remember, we will be finding the areas of the smaller rectangles and then adding those areas together. When you find the area of a rectangle, if skipping counting on our fingers is hard for you, you can draw the rectangle on grid paper to help us. We are going to work on the first page step-by-step.

WARM WELCOME

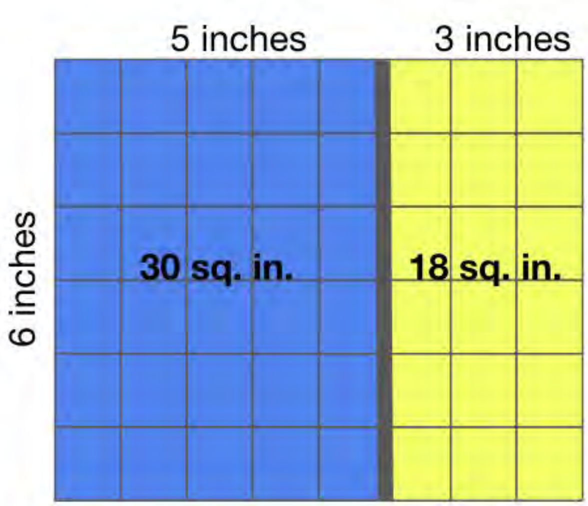
Let's Review:

We can break apart rectangles into smaller rectangles to find the area.

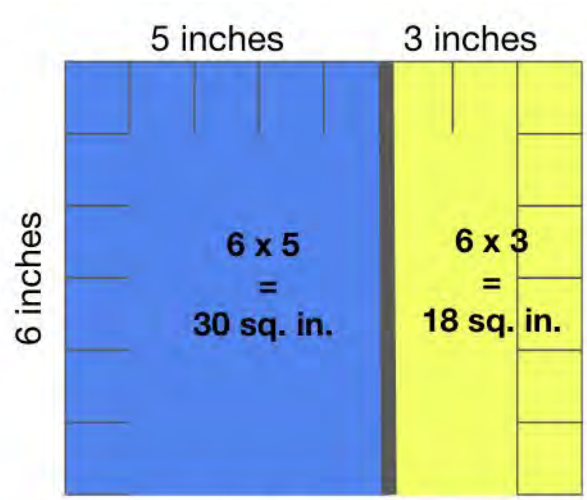
A	B	C
		

Today we apply the **distributive strategy** to find the **total area** of a large rectangle by **adding two products.**

Let's Talk: What is the **same**? What is **different**?



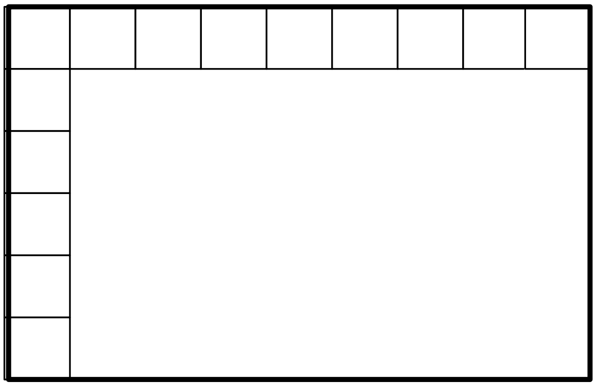
30 sq. in. + 18 sq. in
= 48 square inches



(6 x 5) + (6 x 3)
30 sq. in. + 18 sq. in
= 48 square inches

Let's Think:

Let's find the area using the distributive strategy



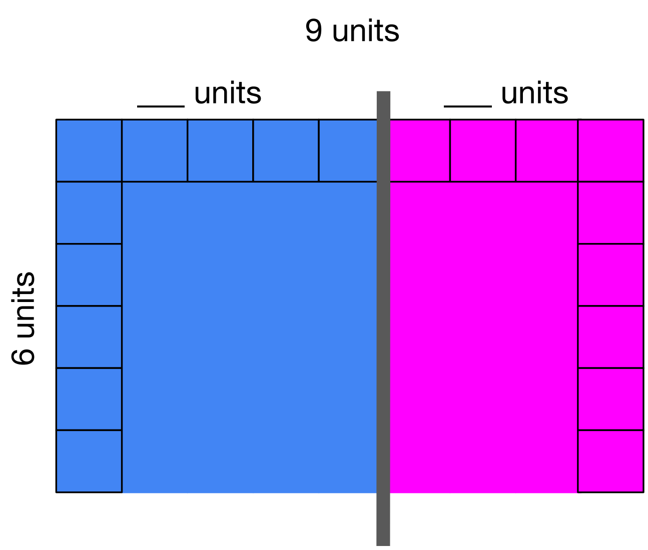
Let's start with a **BIG** rectangle…

_____ units by ____ units

____ x ____

Let's Think:

Let's find the area using the distributive strategy



6 x 9 = 6 x (______ + ______)

6 x 9 =

6 x 9 =

6 x 9 =

Let's Try It:

Let's explore decomposing rectangles with tiles together!

Name:_______________________________ G3 U3 Lesson 7 - Let's Try It

We will apply the distributive strategy to find the total area of a large rectangle by adding two products.

Use the rectangle to find the area of a rectangle that is 7 units by 6 units.

1. The larger rectangle is _______ units by ______ units.

   Area = ___ units x ___ units

2. To help us solve 7 x 6 we make two smaller rectangles by decomposing the length of 6 units into _______ units and _____ unit.

   6 units = ____ units + ___ unit.

3. Rename the 6 to make both sides of the equation equal, or the same.

   7 x 6 = 7 x (____ + _____)

4. The parenthesis show how to _________ the numbers.

5. Find the area of the dark gray rectangle:

   ________ rows of _______ units = ____________ square units.

   ________ x ________ = ___________ square units.

   The area of the dark gray rectangle is _________ square units. Write the equation in the dark gray rectangle to show the area.

6. Find the area of the light gray rectangle:

   ________ rows of _______ unit = ____________ square units.

   ________ x ________ = ___________ square units.

   The area of the light gray rectangle is _____________ square units. Write the equation in the light gray rectangle to show the area.

7. Find the area of the larger rectangle using the distributive strategy.

- Rename the 6 units with 5 units and 1 unit: **7 x 6 = 7 x (____ + _____)**
- Distribute the 7 rows to the 5 columns and the 7 rows to the 1 column. **7 x 6 = (____ x _____) + (_____ x _____)**
- Combine the areas of the smaller rectangles to find the area of the larger rectangle. **7 x 6 =** __________ + ____________

  7 x 6 = __________ **square units.**

The area of a rectangle that is 6 units by 7 units = _____________ square units.

If we filled in all the squares of the large rectangle and counted the squares, there would be __________ square units.

On your Own:

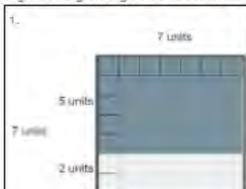
Now you can decompose rectangles with tiles on your own!

Name:_______________________________ G3 U3 Lesson 7 Independent Work

I will apply the distributive strategy to find the total area of a large rectangle by adding two products.

Look at the shape. Fill in the blanks in the equation to help you find the area of the larger rectangle using the distributive strategy.

1.



7 x 7 = ?

7 x 7 = (5+2) x 7

7 x 7 = (___ x ___) + (___ x ___)

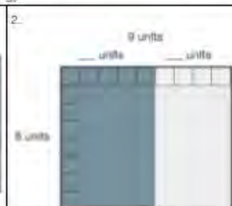
7 x 7 = __________ + __________

7 x 7 = ________

The area of a 7 units by 7 units square is:

____

2.



8 x 9 = ?

8 x 9 = 8 x (5 + 4)

8 x 9 = (___ x ___) + (___ x ___)

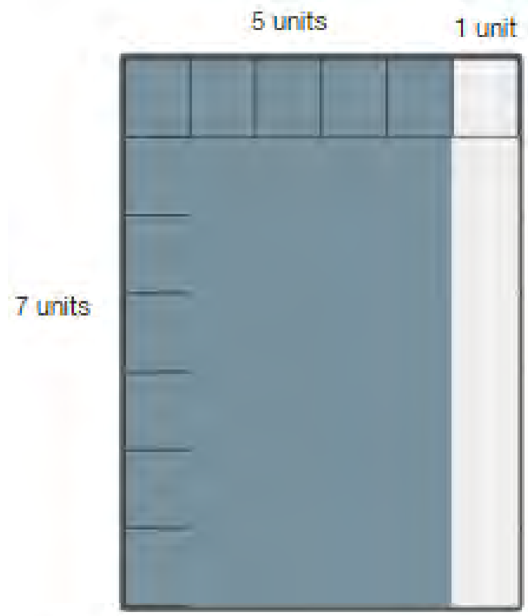
8 x 9 = __________ + __________

8 x 9 = ________

The area of an 8 units by 9 units rectangle is:

____

Use the rectangle to find the area of a rectangle that is 7 units by 6 units.



1. The larger rectangle is ________ units by _______ units.

   area = ___ units x ___ units

2. To help us solve 7 x 6 we make two smaller rectangles by decomposing the length of 6 units into ________ units and ______ unit.

   6 units = _____ units + ____ unit

3. Rename the 6 to make both sides of the equation equal, or the same.

   7 x 6 = 7 x (____ + _____)

4. The parenthesis show how to group the numbers.

5. Find the area of the **dark gray** rectangle:

   _________ rows of ________ units = _________ square units.

   _________ x __________ = _________ square units.

6. The area of the dark gray rectangle is ___________ square units. Write the equation in the dark gray rectangle to show the area.

7. Find the area of the **light gray** rectangle:

   _________ rows of ________ unit = _________ square units.

   _________ x __________ = _________ square units.

8. The area of the light gray rectangle is _________ square units. Write the equation in the light gray rectangle to show the area.

9. Find the area of the larger rectangle using the distributive strategy.

- Rename the 6 units with 5 units and 1 unit: **7 x 6 = 7 x (____ + _____)**

- Distribute the 7 rows to the 5 columns and the 7 rows to the 1 column. **7 x 6 = (____ x _____) + (_____ x _____)**

  ↓ ↓

- Combine the areas of the smaller rectangles to find the area of the larger rectangle. **7 x 6 =** ___________ **+** _____________

  7 x 6 = ____________ **square units.**

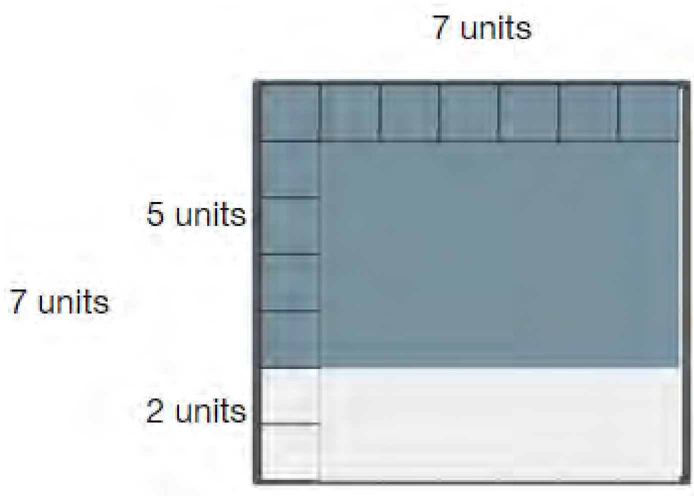
- The area of a rectangle that is 6 units by 7 units = _______________ square units.

- If we filled in all the squares of the large rectangle and counted the squares, there would be ____________ square units.

Name:____ G3 U3 Lesson 7 - Independent Work

Look at the shape. Fill in the blanks in the equation to help you find the area of the larger rectangle using the distributive strategy.

1.



7 x 7 = ?

7 x 7 = (5+2) x 7

7 x 7 = (____ x ____) + (____ x ____)

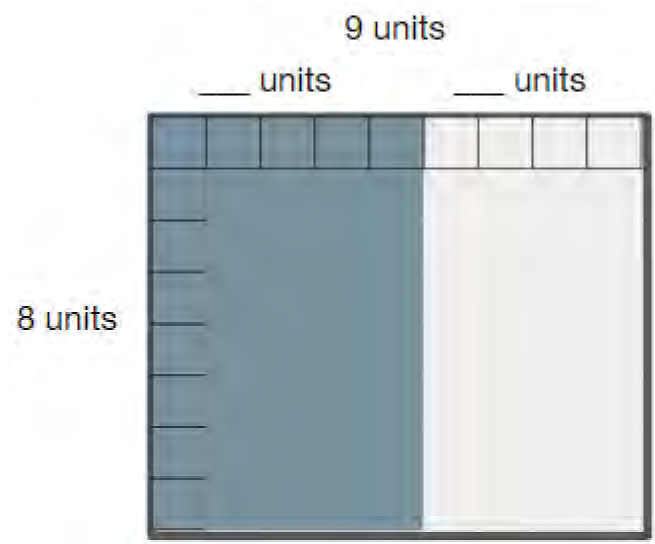
7 x 7 = ___________ + ___________

7 x 7 = _________

The area of a 7 units by 7 units square is:

____

2.



8 x 9 = ?

8 x 9 = 8 x (5 + 4)

8 x 9 = (____ x ____) + (____ x ____)

8 x 9 = ___________ + ___________

8 x 9 = _________

The area of an 8 units by 9 units rectangle is:

____

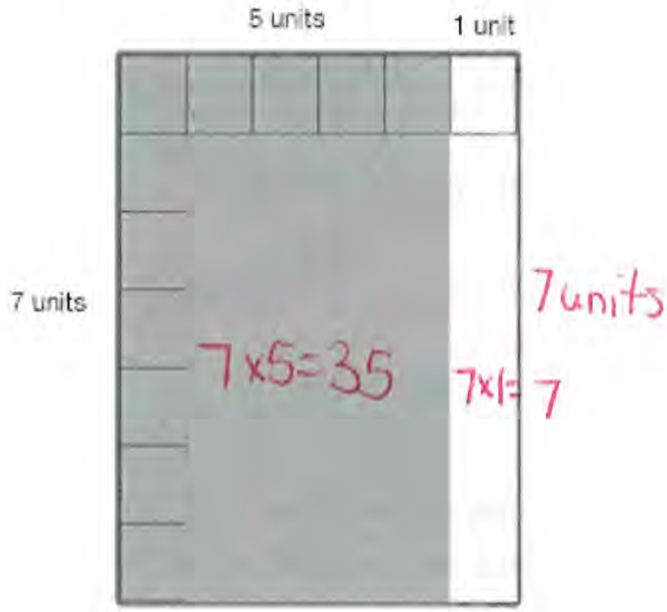
Square Inch Tiles (Grid Paper)

Square Centimeter Tiles (Grid Paper)

Name:______________________________

We will apply the distributive strategy to find the total area of a large rectangle by adding two products.

Use the rectangle to find the area of a rectangle that is 7 units by 6 units.



1. The larger rectangle is ___7___ units by ___6___ units.

Area = _7_ units x _6_ units

2. To help us solve 7 x 6 we make two smaller rectangles by decomposing the length of 6 units into ___5___ units and ___1___ unit.

6 units = _5_ units + _1_ unit.

3. Rename the 6 to make both sides of the equation equal, or the same.

7 x 6 = 7 x (_5_ + _1_)

4. The parenthesis show how to ___group___ the numbers.

5. Find the area of the dark gray rectangle:

7 rows of 5 units = 35 square units.

7 x 5 = 35 square units.

The area of the dark gray rectangle is 35 square units. Write the equation in the dark gray rectangle to show the area.

6. Find the area of the light gray rectangle:

7 rows of 1 unit = 7 square units.

7 x 1 = 7 square units.

The area of the light gray rectangle is 7 square units. Write the equation in the light gray rectangle to show the area.

7. Find the area of the larger rectangle using the distributive strategy.

- Rename the 6 units with 5 units and 1 unit: **7 x 6 = 7 x (** 5 **+** 1 **)**
- Distribute the 7 rows to the 5 columns and the 7 rows to the 1 column. **7 x 6 = (** 7 **x** 5 **) + (** 7 **x** 1 **)**
- Combine the areas of the smaller rectangles to find the area of the larger rectangle.

  7 x 6 = 35 **+** 7

  5+2

  7 x 6 = 42 **square units.**

The area of a rectangle that is 6 units by 7 units = 42 square units.

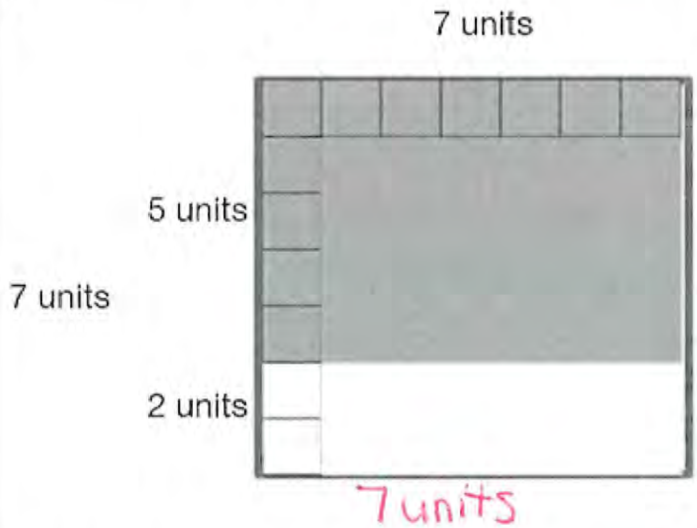
If we filled in all the squares of the large rectangle and counted the squares, there would be 42 square units.

Name:______________________________ G3 U3 Lesson 7 Independent Work

I will apply the distributive strategy to find the total area of a large rectangle by adding two products.

Look at the shape. Fill in the blanks in the equation to help you find the area of the larger rectangle using the distributive strategy.

1.



$7 \times 7 = ?$

$7 \times 7 = (5+2) \times 7$

note: put the 5 and 2 first because students can think "5 rows of 7" "2 rows of 7"

$7 \times 7 = (\underline{5} \times \underline{7}) + (\underline{2} \times \underline{7})$

$7 \times 7 = \underline{35} + \underline{14}$

30+10=40
5+4=9

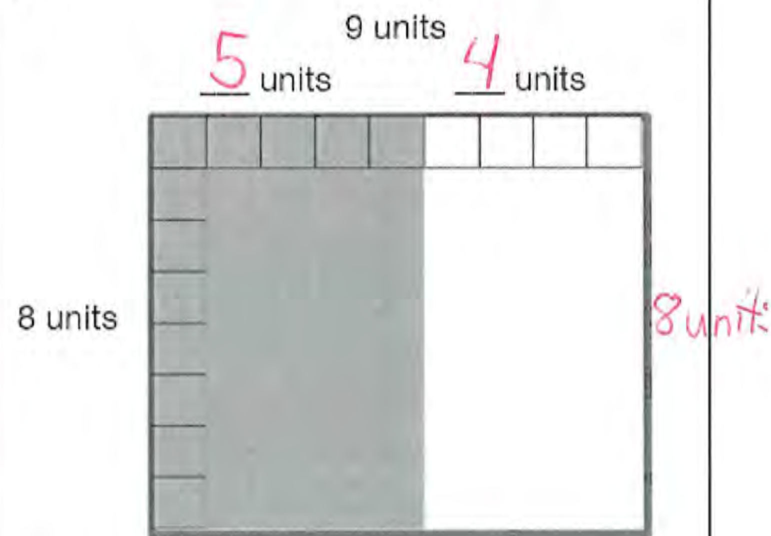
40+9=49

$7 \times 7 = \underline{49}$

The area of a 7 units by 7 units square is:

49 sq units

2.



$8 \times 9 = ?$

$8 \times 9 = 8 \times (5 + 4)$

$8 \times 9 = (\underline{8} \times \underline{5}) + (\underline{8} \times \underline{4})$

$8 \times 9 = \underline{40} + \underline{32}$

$8 \times 9 = \underline{72}$

The area of an 8 units by 9 units rectangle is:

72 sq units

G3 U3 Lesson 8
Decompose rectangles to show the distributive property

CITYTUTOR DC

G3 U3 Lesson 8 - Students will decompose rectangles to show the distributive property

Materials:
- Grid paper for every student

Warm Welcome (Slide 1): Tutor choice.

Frame the Learning/Connect to Prior Learning (Slide 2): We're more than halfway done with our unit on area! The last two sessions we have been learning how to decompose, or break apart, rectangles to find the area. Yesterday we started writing equations that matched how we decomposed rectangles. We called it the distributive strategy. Let's say it together…distributive strategy. You will use this strategy A LOT next year when you multiply really big numbers!

Frame the Learning/Connect to Prior Learning (Slide 3-4): Today we will continue to decompose rectangles to show the distributive strategy. What does decompose mean? Break apart! We will start to move from using tiles to using area models. An area model is where you don't see the squares but you can imagine they are there (*point to image of rectangles on Slide 3)*. We can imagine there are 6 rows of 8 in this larger rectangle (*trace the larger rectangle made up of the dark and light gray rectangles)*. The equations (*point)* may look confusing but the more we connect them to the rectangles, the better you will understand them. We will continue to understand these equations by decomposing, or breaking apart, rectangles.

Let's Talk (Slide 5): Let's warm up our brains and look closely at this equation. First, let's read the equation together…6 times 8 equals 6 times five plus 3. Talk to the person next to you, **share what you notice about the equation.** Possible Student Answers, Key Points:
- The equation on the left is 6 groups of 8
- The equation on the right is also 6 groups of 8 but the 8 is broken into 5 and 3.
- They are the same because 8 is the same as 5 and 3
- They both equal 48.

Those are all interesting ideas! Many of you shared that the two equations are the same or equivalent. The equation on the right just shows 8 and 5 and 3. We put 5+3 in parenthesis to show how we grouped the numbers, or to show one way we can break apart the 8. We will continue to use equations like this today to help us understand the distributive strategy.

Let's Think (Slide 6): Look at these two rectangles. **First, how are they the same?** Share with your partner. Possible Student Answers, Key Points:
- They have the same side lengths, 12 and 7 so they have the same area.
- Rectangle A has all of the tiles shown.
- Rectangle B just has the side lengths and no tiles.
- If we wanted to find the area of A, we could count all the tiles. But to find the area of Rectangle B, we have to either draw it on grid paper or use an equation to find the area.

That's right, these two rectangles are the exact same! The only difference is that Rectangle B doesn't have any of the tiles, so we have to do a little bit more math to find the area. With Rectanlg B, instead of showing a rectangular array with tiles, I erased the tiles and made it an area model. An area model is where you can't see the tiles. When we have an area model, we can imagine the 12 rows of 7 square unit tiles to find the area but we don't always need to see them. But the areas are the same. What are the side lengths? 12 units and 7 units! So, if we want to find the area, we can do 12x7.

Let's Think (Slide 7): But, wow, that's a big multiplication problem! Let's think about some ways that we could break up this rectangle to make it easier to find the area. Remember, we can break up the rows OR the columns. **So, what different ways can you decompose this rectangle?** Possible Student Answers, Key Points:

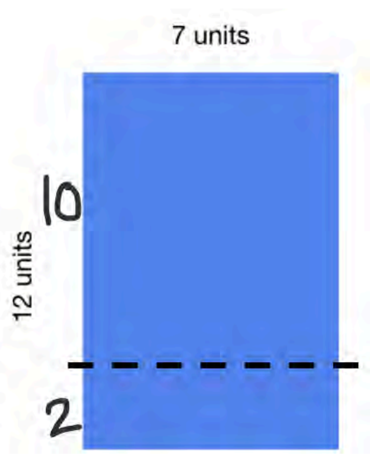
- I can decompose the 7 into 5 and 2 or 4 and 3.
- I can decompose the 12 into 10 and 2.
- I can decompose the 12 into 6 and 6 or 5 and 7.

Let's Think (Slide 8): All of those are ways we can decompose the rectangle! Here are a few examples.

- The one on the left cut the columns into 5 and 2. So, 12 groups of 5 and 12 groups of 2.
- The second one cut the rows into 6 and 6. So, 6 groups of 7 and another 6 groups of 7.
- The third one cut the rows also except they cut it into 2 and 10…those are both easy numbers to work with! So 2 groups of 6 and 10 groups of 6.
- And finally, the last rectangle cut the columns into 1 and 6. So 12 groups of 1 and then 12 groups of 6.

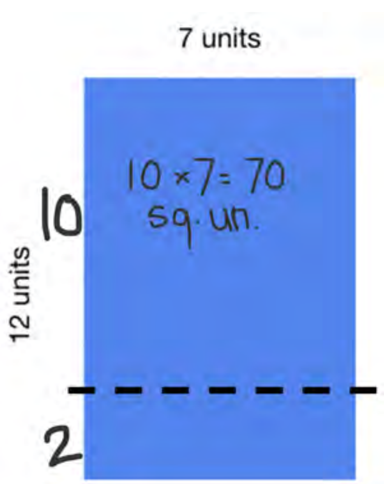
No matter how you cut this rectangle, you'll get the same area.

Let's Think (Slide 9): So, I chose a way to decompose this rectangle and I want you to see if you can figure out how I decided to cut it. Look at the equation *(point).* Let's read it together: 12 times 7 EQUALS 10 plus 2 times 7. This equation looks similar to the equation we looked at in our warm up but with different numbers. What part of the equation do you think shows how to decompose this rectangle? I see a 10 + 2. That's the same as 12 so maybe she split the 12 rows into 10 rows and 2 rows!



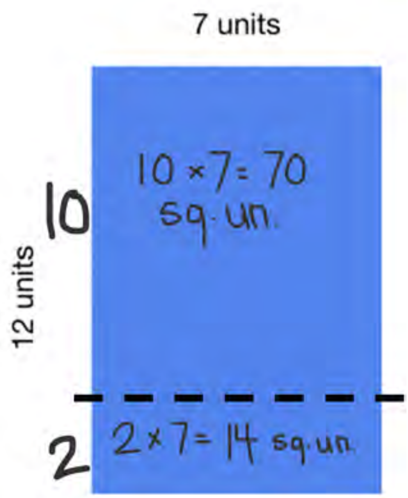
I know the equal sign means the same as, so I want both sides of the equation to be balanced, or the same. I see 12 x 7 on one side (*point*). I see 10 + 2 in parenthesis and then times 7 on the other side. I know 12 is the same as 10 + 2 so you can see I decided to break the 12 rows into 10 rows plus 2 rows *(slide your fingers across ten rows and 2 rows)*. In the equation I renamed the 12 as 10+2. So let me cut my rectangle to show that I cut the 12 rows into 10 rows and then 2 more rows.

You shared many ways to decompose this rectangle. Why do you think I chose to decompose, or break apart the 12 unto 10 and 2? 10 is really easy to multiply by! Exactly! We can just skip count by 10s on our fingers if we don't know how.



Let's use the distributive strategy to find the area of the larger rectangle. We already decomposed the rectangle. How can we find the area of the top rectangle? Multiply 10 x 7. Correct, I can imagine 10 rows of 7 which is the same as 10 times 7. We know 10 x 7! If you don't, skip count by tens 7 times. 10, 20, 30, 40, 50, 60, 70…So, 10 x 7? 70!

That means if I filled in all the rows and columns I would have how many tiles? 70 tiles. The area of the top smaller rectangle is? The area is 70 square units.



Now we need to find teh area of the bottom rectangle! I can imagine two rows of ______. Hmm what is this bottom side length? Well if this length is 7 units *(point to the top side)* then the opposite side length is also 7 units/

So 2 rows of 7, or 2 times 7 equals? 14! That's right, 7 + 7 is a doubles fact.What is the area of the bottom rectangle? The area of the bottom rectangle is 14 square units.

We just showed on our rectangle that we decomposed the 12 rows into 10 rows plus 2 rows. Then we found the area of the two smaller rectangles by multiplying the side lengths. Let's show what we did on the equation.

12 x 7 = (10 + 2) x 7

$12 \times 7 = (10 \times 7)\ (2 \times 7)$

We took 12 x 7 and to find the area we multiplied 10 x 7 and then we multiplied 2 x 7*.* We distributed the 7 columns to the 10 rows and the 7 columns to the 2 rows.

12 x 7 = (10 + 2) x 7

$12 \times 7 = (10 \times 7) + (2 \times 7)$

To find the area of the larger rectangle we have to do what with the area from the top rectangle and the area from the bottom rectangle? Combine them! Add them! Let's put a plus sign between those two multiplication expressions to show that we are adding those areas to find the area of the larger rectangle.

12 x 7 = (10 + 2) x 7

$12 \times 7 = (10 \times 7) + (2 \times 7)$

$12 \times 7 = 70 + 14$

We already solved for the areas. So, what's 10 x 7? 70! And, what's 2 x 7? 14!

12 x 7 = (10 + 2) x 7

$12 \times 7 = (10 \times 7) + (2 \times 7)$

$12 \times 7 = 70 + 14$

$12 \times 7 = 84$

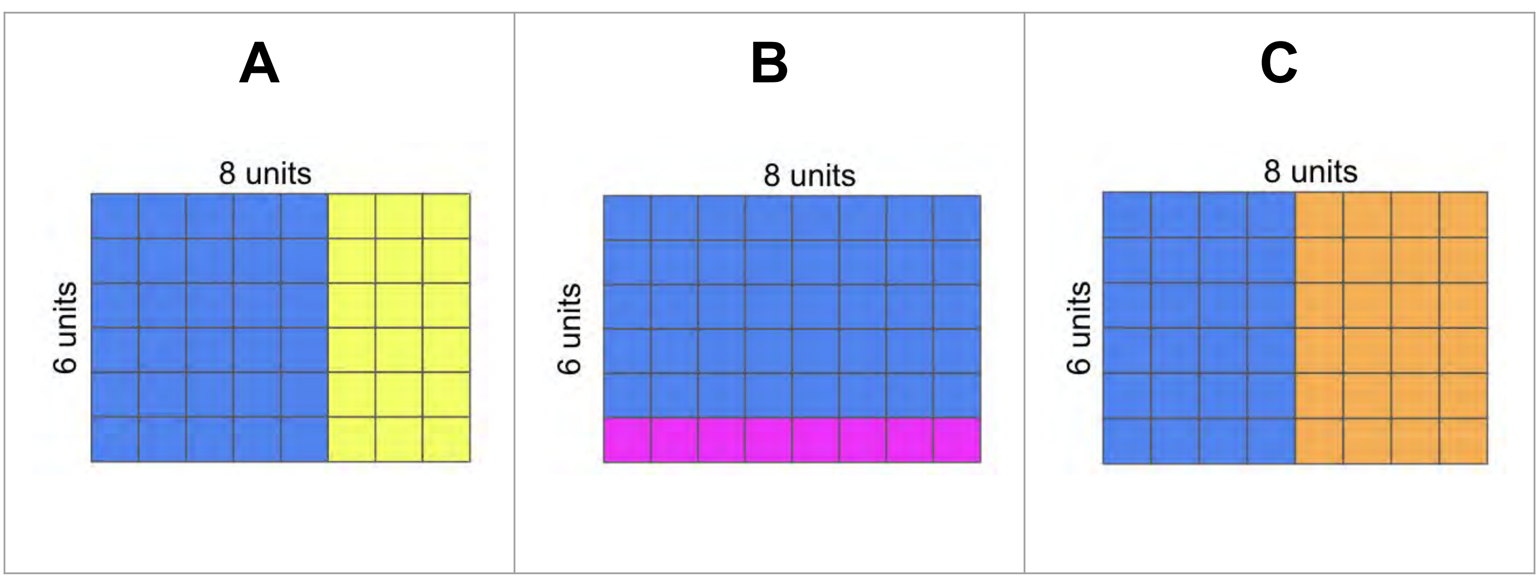
Finally 70 + 14? 84! So 12 x 7 = 84*.* What is the area of a rectangle with 12 rows and 7 columns? 84 square units!

We used the distributive strategy to help us solve. We decomposed the 12 rows into 10 rows and 2 rows. Then we found the area of the top rectangle and the bottom rectangle. Then we added those two areas together to find the area of the large rectangle! It's hard work but you're doing great!

Let's Try it (Slides 10-11): Now let's work on using the distributive strategy to find the area of a larger rectangle. Remember when we write the equations, we are thinking about how we decomposed, or broke apart, one of the side lengths. Then we think about how to find the area of the smaller rectangles. Then we add those areas together! We are going to work on the first page step-by-step.

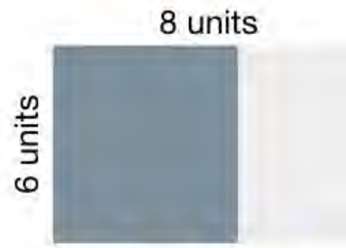
WARM WELCOME

Let's Review: We can break apart rectangles into smaller rectangles to find the area.



Let's Review:

We can use the **distributive strategy** to show how we break up rectangles.

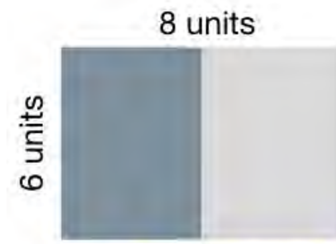


$6 \times 8 = 6 \times (5 + 3)$

$6 \times 8 = (6 \times 5) + (6 \times 3)$

$6 \times 8 = 30 + 18$

$6 \times 8 = 48$



$6 \times 8 = 6 \times (4 + 4)$

$6 \times 8 = (6 \times 4) + (6 \times 4)$

$6 \times 8 = 24 + 24$

$6 \times 8 = 48$

Today we will decompose rectangles to show the distributive strategy.

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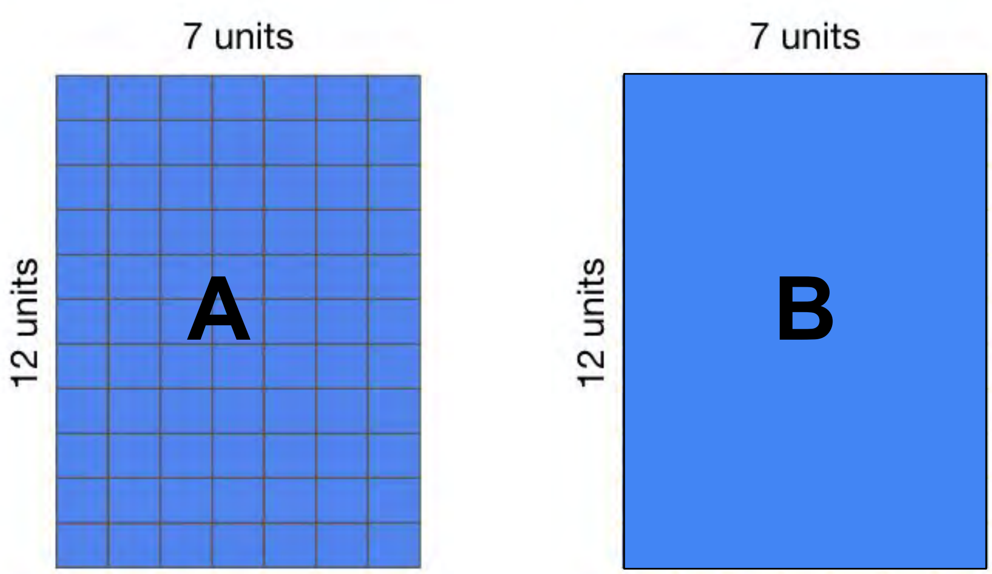
Let's Talk:

What do you notice about the equation?

$$6 \times 8 = 6 \times (5 + 3)$$

Let's Think:

How are these two rectangles the same? Different?



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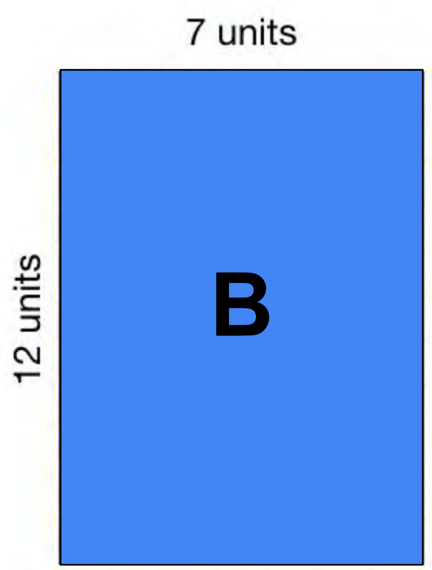
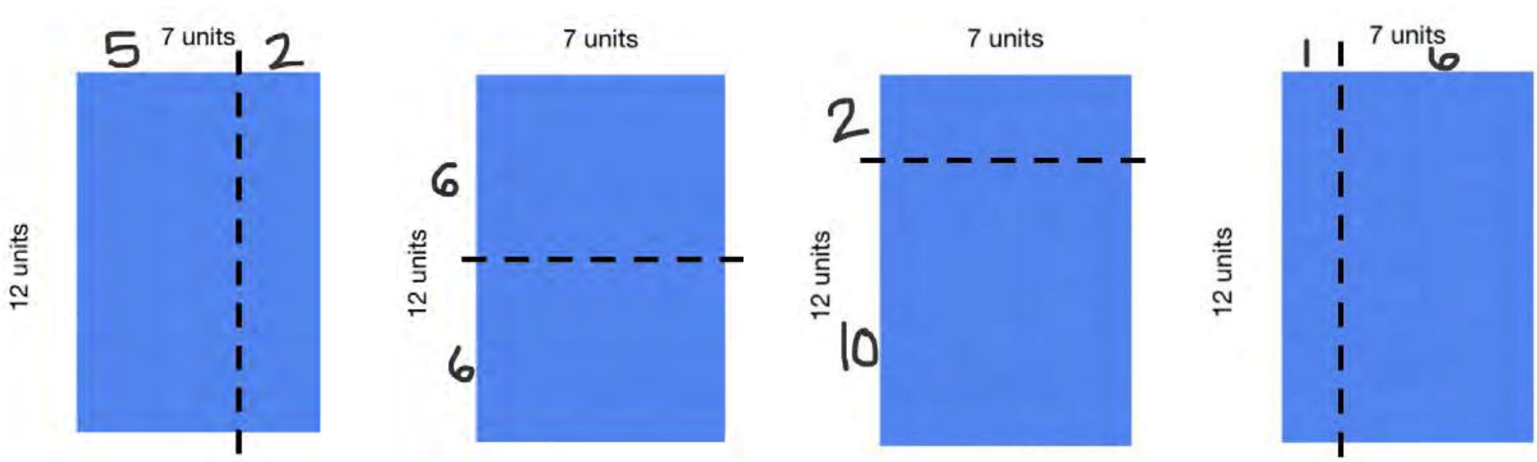
Let's Think:

What are some ways we can decompose this rectangle?



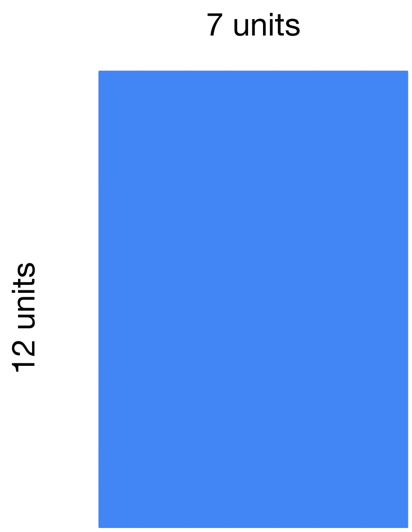
Let's Think:

We can split this rectangle LOTS of different ways.



Let's Think:

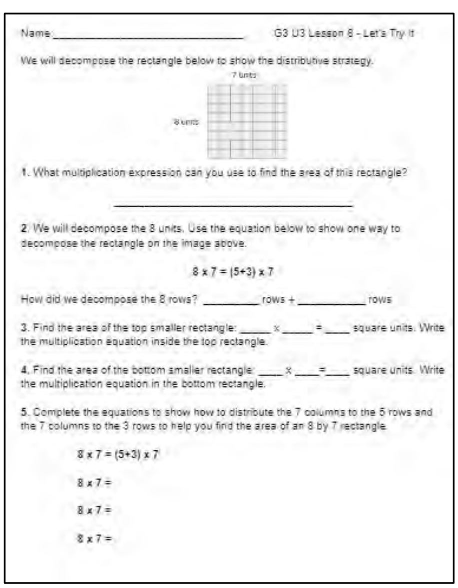
Where does the equation show how to decompose this rectangle?



$$12 \times 7 = (10 + 2) \times 7$$

Let's Try It:

Let's explore decomposing rectangles together!



Name:____________________________ G3 U3 Lesson 8 - Let's Try It

We will decompose the rectangle below to show the distributive strategy.

7 units

8 units

1. What multiplication expression can you use to find the area of this rectangle?

____

2. We will decompose the 8 units. Use the equation below to show one way to decompose the rectangle on the image above.

8 x 7 = (5+3) x 7

How did we decompose the 8 rows? _________ rows + __________ rows

3. Find the area of the top smaller rectangle: _____ x _____ = ____ square units. Write the multiplication equation inside the top rectangle.

4. Find the area of the bottom smaller rectangle: ____ x ____=____ square units. Write the multiplication equation in the bottom rectangle.

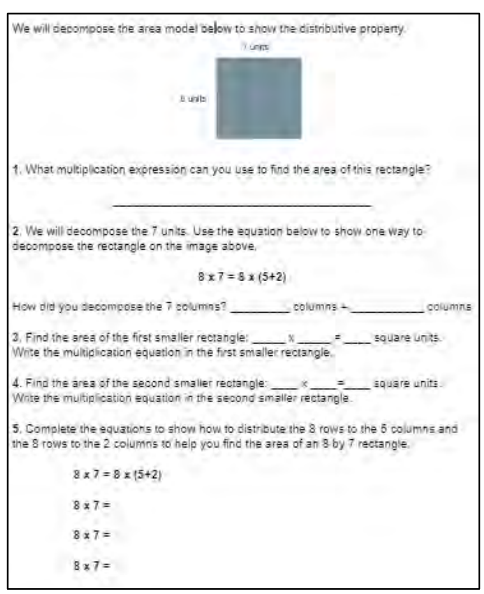
5. Complete the equations to show how to distribute the 7 columns to the 5 rows and the 7 columns to the 3 rows to help you find the area of an 8 by 7 rectangle.

8 x 7 = (5+3) x 7

8 x 7 =

8 x 7 =

8 x 7 =



We will decompose the area model below to show the distributive property.

7 units

8 units

1. What multiplication expression can you use to find the area of this rectangle?

____

2. We will decompose the 7 units. Use the equation below to show one way to decompose the rectangle on the image above.

8 x 7 = 8 x (5+2)

How did you decompose the 7 columns? _________ columns + ___________ columns

3. Find the area of the first smaller rectangle: _____ x _____ = ____ square units. Write the multiplication equation in the first smaller rectangle.

4. Find the area of the second smaller rectangle: ____ x ____=____ square units. Write the multiplication equation in the second smaller rectangle.

5. Complete the equations to show how to distribute the 8 rows to the 5 columns and the 8 rows to the 2 columns to help you find the area of an 8 by 7 rectangle.

8 x 7 = 8 x (5+2)

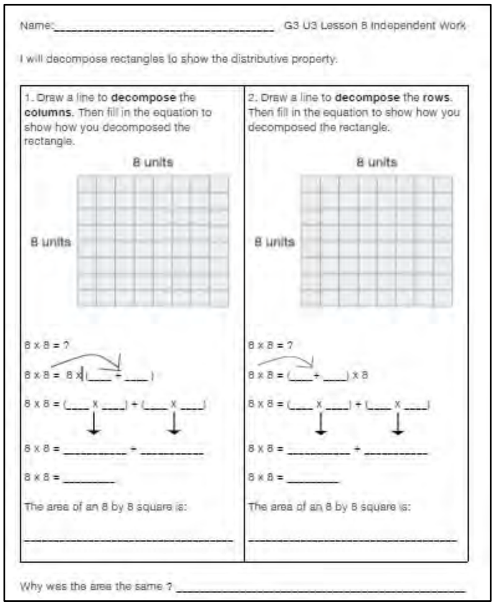
8 x 7 =

8 x 7 =

8 x 7 =

On your Own:

Now you can decompose rectangles on your own!



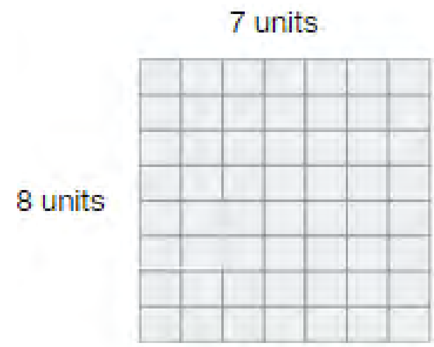
Name:______________________________ G3 U3 Lesson 8 Independent Work

I will decompose rectangles to show the distributive property.

1. Draw a line to **decompose** the **columns**. Then fill in the equation to show how you decomposed the rectangle.	2. Draw a line to **decompose** the **rows**. Then fill in the equation to show how you decomposed the rectangle.
8 units / 8 units	8 units / 8 units
8 x 8 = ?	8 x 8 = ?
8 x 8 = 8 x (___ + ___)	8 x 8 = (___ + ___) x 8
8 x 8 = (___ x ___) + (___ x ___)	8 x 8 = (___ x ___) + (___ x ___)
8 x 8 = ________ + ________	8 x 8 = ________ + ________
8 x 8 = ______	8 x 8 = ______
The area of an 8 by 8 square is: ____________________	The area of an 8 by 8 square is: ____________________

Why was the area the same ? ________________________________

Name:________________________________ G3 U3 Lesson 8 - Let's Try It



Let's decompose the rectangle below to show the distributive strategy.

1. What multiplication expression can you use to find the area of this rectangle?

____

2. We will decompose the 8 units. Use the equation below to show one way to decompose the rectangle on the image above.

8 x 7 = (5+3) x 7

How did we decompose the 8 rows? _________ rows + ___________ rows

3. Find the area of the top smaller rectangle: _____ x _____ = ____ square units. Write the multiplication equation inside the top rectangle.

4. Find the area of the bottom smaller rectangle: ____ x ____=____ square units. Write the multiplication equation in the bottom rectangle.

5. Complete the equations to show how to distribute the 7 columns to the 5 rows and the 7 columns to the 3 rows to help you find the area of an 8 by 7 rectangle.

8 x 7 = (5+3) x 7

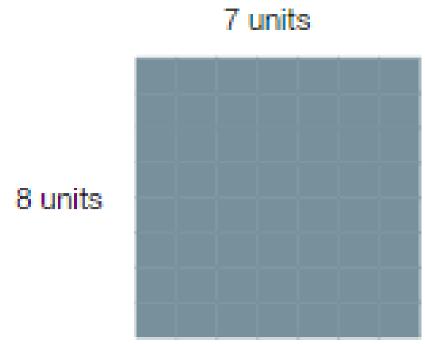
8 x 7 =

8 x 7 =

8 x 7 =

Let's decompose the rectangle below to show the distributive strategy.

1. What multiplication expression can you use to find the area of this rectangle?



____

2. We will decompose the 7 units. Use the equation below to show one way to decompose the rectangle on the image above.

8 x 7 = 8 x (5+2)

How did you decompose the 7 columns? _________ columns + ___________ columns

3. Find the area of the first smaller rectangle: _____ x _____ = ____ square units. Write the multiplication equation in the first smaller rectangle.

4. Find the area of the second smaller rectangle: ____ x ____=____ square units. Write the multiplication equation in the second smaller rectangle.

5. Complete the equations to show how to distribute the 8 rows to the 5 columns and the 8 rows to the 2 columns to help you find the area of an 8 by 7 rectangle.

8 x 7 = 8 x (5+2)

8 x 7 =

8 x 7 =

8 x 7 =

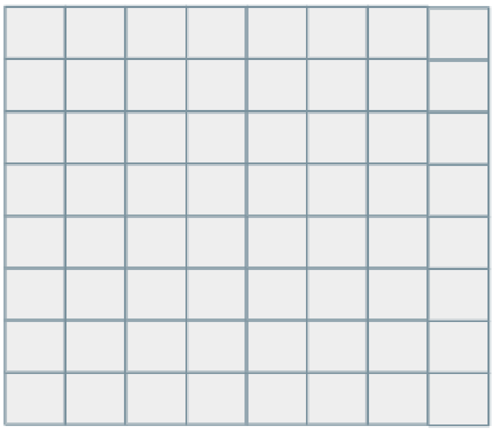
Name:________________________________ G3 U3 Lesson 8 Independent Work

I will decompose rectangles to show the distributive property.

1. Draw a line to **decompose** the **columns**. Then fill in the equation to show how you decomposed the rectangle.

8 units

8 units



8 x 8 = ?

8 x 8 = 8 x (____ + ____)

8 x 8 = (____ x ____) + (____ x ____)

8 x 8 = ___________ + ___________

8 x 8 = _________

The area of an 8 by 8 square is:

____

2. Draw a line to **decompose** the **rows**. Then fill in the equation to show how you decomposed the rectangle.

8 units

8 units

8 x 8 = ?

8 x 8 = (____+ ____) x 8

8 x 8 = (____ x ____) + (____ x ____)

8 x 8 = ___________ + ___________

8 x 8 = _________

The area of an 8 by 8 square is:

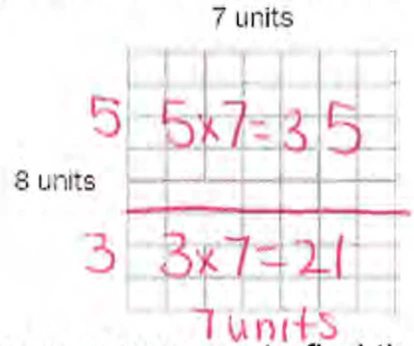
____

Why was the area the same ? ____

Square Inch Tiles (Grid Paper)

Square Centimeter Tiles (Grid Paper)

We will decompose the rectangle below to show the distributive strategy.



1. What multiplication expression can you use to find the area of this rectangle?

8 x 7

2. We will decompose the 8 units. Use the equation below to show one way to decompose the rectangle on the image above.

8 x 7 = (5+3) x 7

How did we decompose the 8 rows? __5__ rows + __3__ rows

3. Find the area of the top smaller rectangle: __5__ x __7__ = __35__ square units. Write the multiplication equation inside the top rectangle.

4. Find the area of the bottom smaller rectangle: __3__ x __7__ = __21__ square units. Write the multiplication equation in the bottom rectangle.

5. Complete the equations to show how to distribute the 7 columns to the 5 rows and the 7 columns to the 3 rows to help you find the area of an 8 by 7 rectangle.

8 x 7 = (5+3) x 7

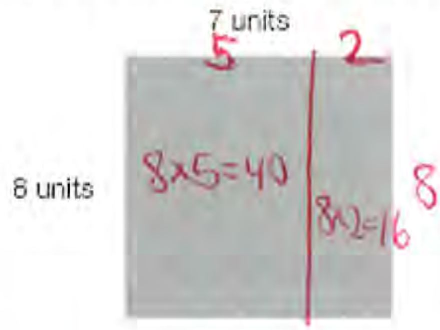
8 x 7 = (5x7)+(3x7)

8 x 7 = 35 + 21

30+20=50
5+1=6
50+6=56

8 x 7 = 56

We will decompose the area model below to show the distributive property.



1. What multiplication expression can you use to find the area of this rectangle?

8 x 7

2. We will decompose the 7 units. Use the equation below to show one way to decompose the rectangle on the image above.

8 x 7 = 8 x (5+2)

*Notes On this side we are decomposing the columns.

How did you decompose the 7 columns? 5 columns + 2 columns

3. Find the area of the first smaller rectangle: 8 x 5 = 40 square units.
Write the multiplication equation in the first smaller rectangle.

4. Find the area of the second smaller rectangle: 8 x 2 = 16 square units.
Write the multiplication equation in the second smaller rectangle.

5. Complete the equations to show how to distribute the 8 rows to the 5 columns and the 8 rows to the 2 columns to help you find the area of an 8 by 7 rectangle.

8 x 7 = 8 x (5+2)

8 x 7 = (8x5)+(8x2)

8 x 7 = 40+16

8 x 7 = 56

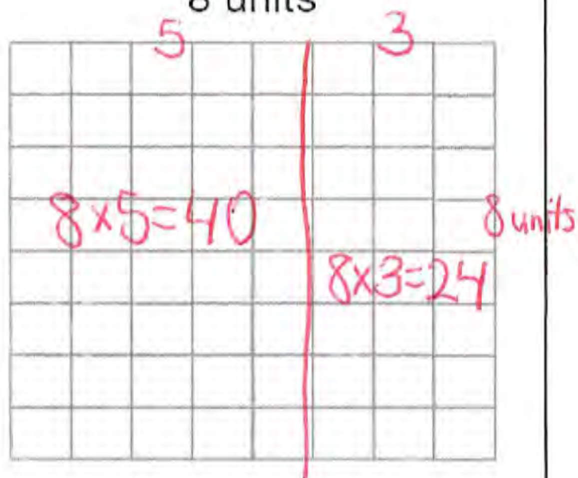
Name:______________________________ G3 U3 Lesson 8 Independent Work

I will decompose rectangles to show the distributive property.

1. Draw a line to **decompose** the **columns**. Then fill in the equation to show how you decomposed the rectangle.

8 units

8 units



8 x 8 = ?

8 x 8 = 8 x (5 + 3)

8 x 8 = (8 x 5) + (8 x 3)

8 x 8 = 40 + 24

8 x 8 = 64

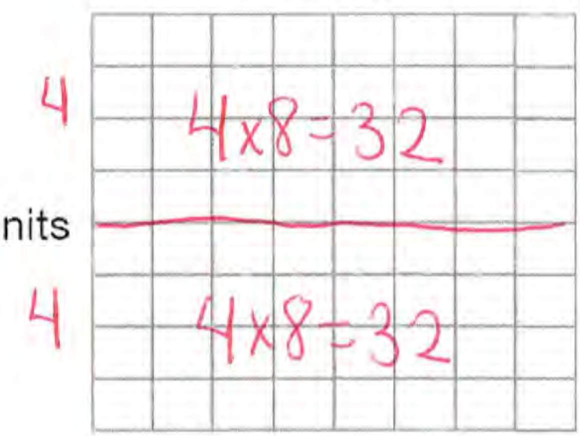
The area of an 8 by 8 square is:

64 sq. units

2. Draw a line to **decompose** the **rows**. Then fill in the equation to show how you decomposed the rectangle.

8 units

8 units



8 x 8 = ?

8 x 8 = (4 + 4) x 8

8 x 8 = (4 x 8) + (4 x 8)

8 x 8 = 32 + 32

8 x 8 = 64

The area of an 8 by 8 square is:

64 sq units

Why was the area the same ? They both have 8 rows of 8 so have the same total number of squares.

G3 U3 Lesson 9

Find the area of shapes made out of rectangles by decomposing the shape into smaller rectangles

G3 U3 Lesson 9 - Students will find the area of shapes made out of rectangles by decomposing the shape into smaller rectangles

Materials:

- Grid paper for every student

Warm Welcome (Slide 1): Tutor choice.

Let's Review (Slide 2): Over the last three sessions we've learned that you can decompose, or break apart rectangles into smaller rectangles to help you find the area. We know that we can break rectangles horizontally or vertically to help us find the area. This is a really helpful strategy when the rectangles have larger side lengths and a strategy you will use A LOT next year in fourth grade when you multiply really big numbers!

Let's Review (Slide 3): We also learned that when we take the rectangle, break it apart, find the area of the smaller rectangles, then add their areas to find the area of the larger rectangle that's called the DISTRIBUTIVE STRATEGY. Say it with me…distributive strategy! In this example, we broke the 12 into 10 and 2, which is still 12. So we did 10 groups of 7 AND 2 groups of 7, which is the same as 12 groups of 7 and gives us a total area of 84.

Frame the Learning/Connect to Prior Learning (Slide 4): Today we find the area of polygons, or shapes, that aren't rectangles or squares–sometimes you'll hear them called rectilinear figures. But, we can use what we know about finding the area of rectangles to decompose these shapes into rectangles and squares to help us find the area.

Let's Talk (Slide 5): Look at this shape. **What do you notice about this shape? What do you think are some ways you can find the area of this shape?** Possible Student Answers, Key Points:

- It's not a rectangle like the other shapes we've been looking at.
- It has a big rectangle on the bottom and then one stacked on top of it.
- We could cut it across and then we'd have a smaller rectangle at the top and a bigger rectangle on the bottom.
- We could cut it up and down and then we'd have a square on the left and a rectangle on the right.
- To find the area, we can count all of the squares.
- To find the area, we can cut it into two rectangles and then multiply the side lengths of the smaller rectangles and add the two areas together.
- We could fill in the rest of the rectangle and then take that white part away!

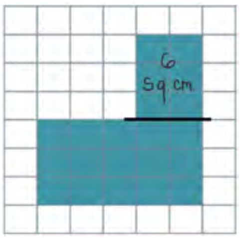
I heard so many great ideas of how we can find the area of this shape. Just like when we find the area of a rectangle, we could count the squares inside of this shape. But, we won't always have the square tiles shown on the inside, so we want to think about how else we can find area using what we already know. Today we will think about how we can break apart this shape into smaller rectangles or squares and then find the area of both rectangles and add the areas back together. It is very similar to the steps we took when decomposing a rectangle, let me show you. So, imagine that you have a pair of scissors and we want to cut this shape so that we end up with rectangles. **Does anyone see a place where we can cut this shape and end up with rectangles? Come trace it with your fingers!**

Let's Think (Slide 6): Very nice, you all thought of a few different ways to cut this shape to end up with rectangles. Let's make sure that we see all the ways…

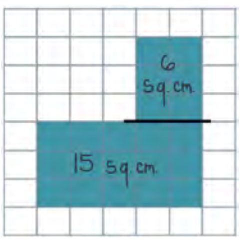
- One place I can cut is vertically, like in Example A. If I cut up and down (*trace with fingers*), then I am left with a square and a rectangle (*point*).

- I can also cut horizontally, like in Example B. If I cut across (*trace with fingers)*, then I am left with a big rectangle on the bottom and a smaller rectangle on the top (*pointl).*
- And finally, I could cut it two places and make 3 smaller shapes. I could cut horizontally AND vertically (*trace with fingers)* and then I am left with a big square and two of the same sized rectangles (*point).*

Let's Think (Slide 7): As you can see, there is not one right way to decompose this shape into rectangles to find the area.



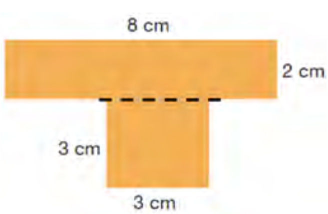
For now, let's explore Example B, where we are cutting the shape horizontally, like this (*draw line*). Now that we cut it, how many rectangles do we have? 2! Let's find the area of the top rectangle. Talk to the person next to you. What is the area? 6 square centimeters! That's right, the area is 6 square cm. We see 3 rows of 2 which is the same as 3x2 and 3x2=6. We know the units are cm because we see it says one square = 1 square cm. Let's label 6 sq cm in the rectangle to remember.



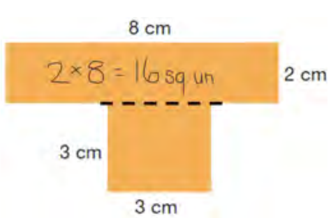
Now let's find the area of the bottom rectangle *(point)*. First, let's think about the dimensions of this rectangle. What is this vertical side length (*point*)? 3! And, let's look at the horizontal side length, this one is tricky because the top is attached to the recntalge up here (*point).* But, we can still figure the side length, we can either count the top and we see 3 units and 2 more units here, which is 5 units. But look, we also know hthat opposites sides have the same length, so if we can't find the top, w can just find the bottom, and then bottom is 5 units. So this bottom rectangle has dimensions of 3 units by 5 units. So, what's the area of this rectangle? 15 square cm!

But, we're not done. We have the area of both rectangles, but we don't have the area of the whole rectinlinear figure. So, what can we do? We need to add the areas! So we need to add 6 and 15 to find the whole area. So, what is the area of the whole figure? The area of this shape = 21 square cm! That's right, the area of the whole figure is 21 square centimeters.

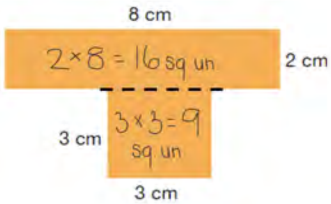
Let's Think (Slide 8): Look at this shape. What's different now? We don't see the square tiles anymore! It's an area model. Some of the side lengths are labeled. Correct. Now the image doesn't have the squares filled in and we need to imagine them. But, we can still follow the same strategy to find the area. We can break this shape into smaller rectangles, find the areas, and then add the areas together. But this time we will need to think carefully about the side lengths and then multiply the side lengths to find the area.



Who can come up and show where to decompose, or break apart this shape into two rectangles? Oh, there are a few ways! But, let's imagine we can only make ONE cut, we'd have to cut it here (*draw horizontal line*). Rememeber, there is not JUST one right way to decompose this shape into rectangles to find the area but for now, we will choose to decompose the rectangle here.



How many rectangles do we see now? 2! Let's find the area of the top rectangle. Talk to the person next to you, what are the dimensions of the top rectangle? I see the side lengths are 2 cm by 8 cm. That's right, the top is 8 cm and the side is 2 cm–even though the left side isn't labeled, we can check the opposite side. So, we can imagine 2 rows of 8 which is the same as 2 x 8, which is 16 square cm.



Now let's look at this bottom rectangle. What do you notice is special about it? The rows and the columns are both 3 cm, so it must be a square! Yes, when all the sides of a rectangle are equal, that means it's a special kind of rectangle called a square. So, what's the area of this square? 9 square cm! That's right, 3 groups of 3 is…3, 6, 9!

We know the area of the top rectangle, 16, and we know the area of the bottom rectangle, 9. Now we need to combine those areas. So, what is 16 + 9? 25 square cm!

Let's Try it (Slides 9-10): Now let's work on decomposing the shapes into rectangles to find the area together! Remember, we will find smaller rectangles in the shape, find the areas of those rectangles, and then add those areas together to find the area of the whole shape! We are going to work on the first page step-by-step.

WARM WELCOME

Let's Review: We can break apart rectangles into smaller rectangles to find the area.

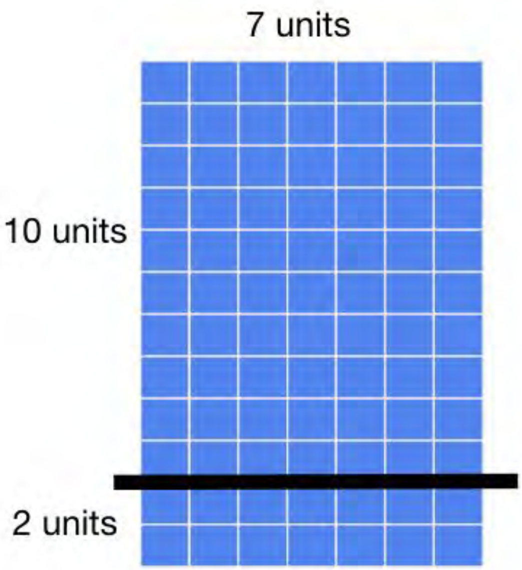
A

B

C

Let's Review:

We can use the distributive strategy to find the area of rectangles.



$$12 \times 7 = (10 + 2) \times 7$$

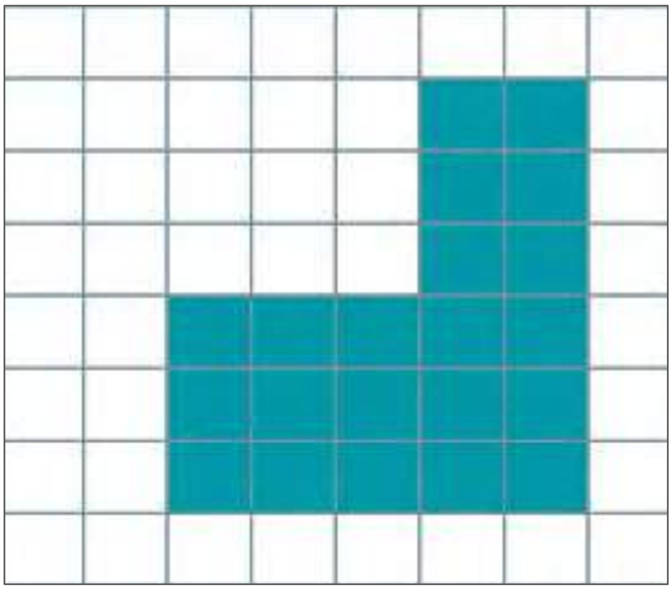
$$12 \times 7 = (10 \times 7) + (2 \times 7)$$

$$12 \times 7 = 70 + 14$$

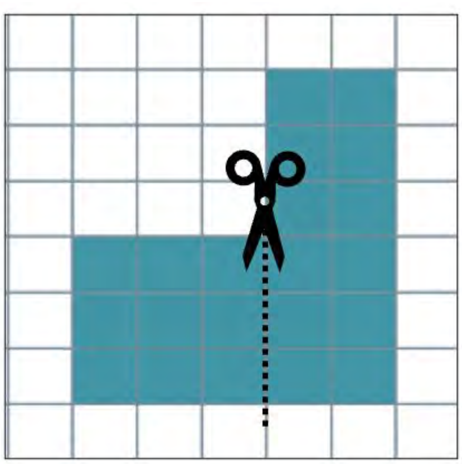
$$12 \times 7 = 84$$

Today we will find the area of shapes made out of rectangles by decomposing the shape into smaller rectangles.

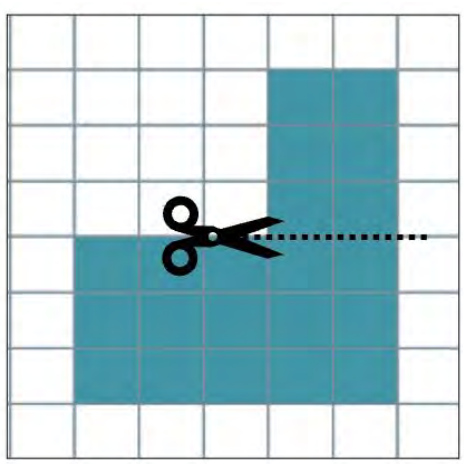
Let's Talk: What are some ways we can find the area of this shape?



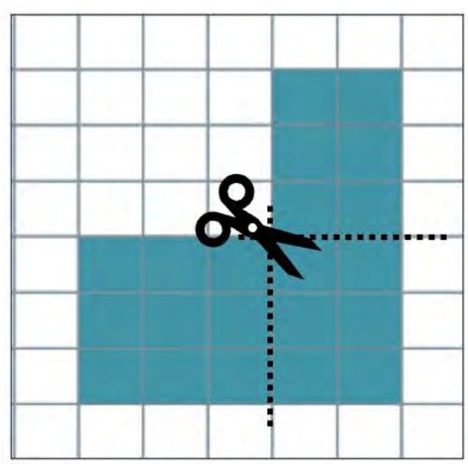
Let's Think: We can decompose this shape into rectangles a few different ways.



A



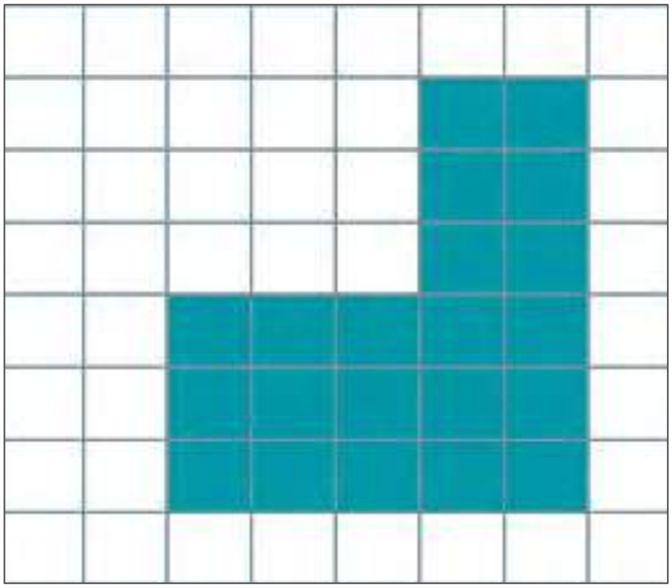
B



C

Let's Think:

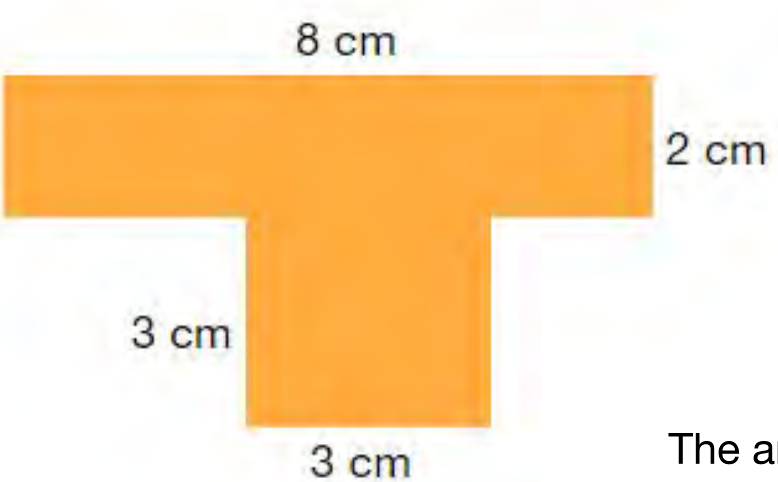
Let's decompose this shape into rectangles to find the area.



Area = _____________ sq cm

Let's Think:

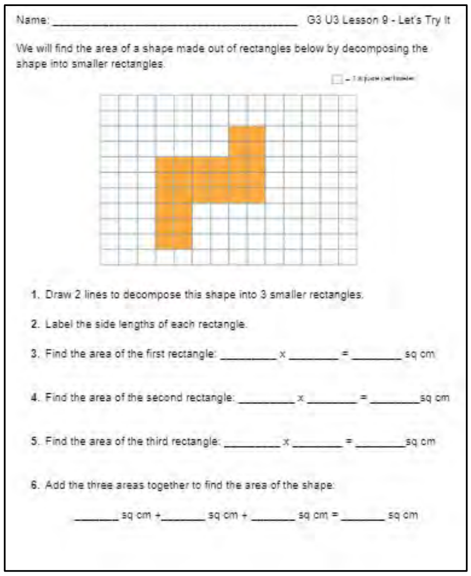
Let's decompose this shape into rectangles to find the area.



The area of this figure is _______ sq cm.

Let's Try It:

Let's explore decomposing shapes into rectangles to find the area!

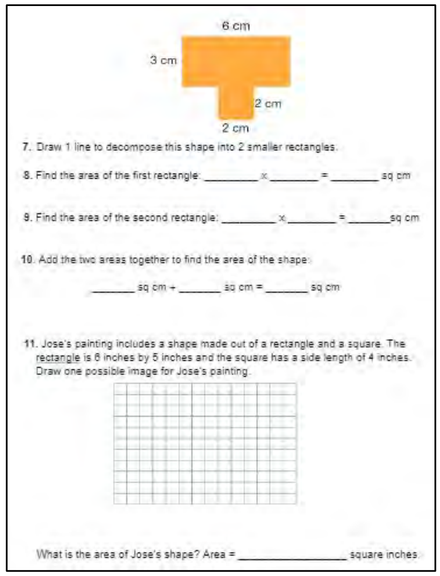


Name: ______________________________ G3 U3 Lesson 9 - Let's Try It

We will find the area of a shape made out of rectangles below by decomposing the shape into smaller rectangles.

1. Draw 2 lines to decompose this shape into 3 smaller rectangles.
2. Label the side lengths of each rectangle.
3. Find the area of the first rectangle: ________ x _______ = _______ sq cm
4. Find the area of the second rectangle: ________ x _______ = _______ sq cm
5. Find the area of the third rectangle: ________ x _______ = _______ sq cm
6. Add the three areas together to find the area of the shape:

_______ sq cm + _______ sq cm + _______ sq cm = _______ sq cm



7. Draw 1 line to decompose this shape into 2 smaller rectangles.
8. Find the area of the first rectangle: ________ x _______ = _______ sq cm
9. Find the area of the second rectangle: ________ x _______ = _______ sq cm
10. Add the two areas together to find the area of the shape:

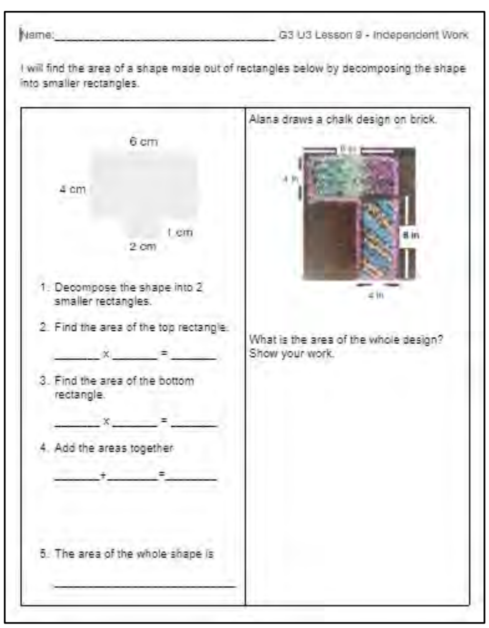
_______ sq cm + _______ sq cm = _______ sq cm

11. Jose's painting includes a shape made out of a rectangle and a square. The rectangle is 6 inches by 5 inches and the square has a side length of 4 inches. Draw one possible image for Jose's painting.

What is the area of Jose's shape? Area = ______________ square inches

On your Own:

Now you can decompose the shapes into rectangles to find the area on your own!



Name: ______________________________ G3 U3 Lesson 9 - Independent Work

I will find the area of a shape made out of rectangles below by decomposing the shape into smaller rectangles.

1. Decompose the shape into 2 smaller rectangles.
2. Find the area of the top rectangle.

______ x ______ = ______

3. Find the area of the bottom rectangle.

______ x ______ = ______

4. Add the areas together

______ + ______ = ______

5. The area of the whole shape is

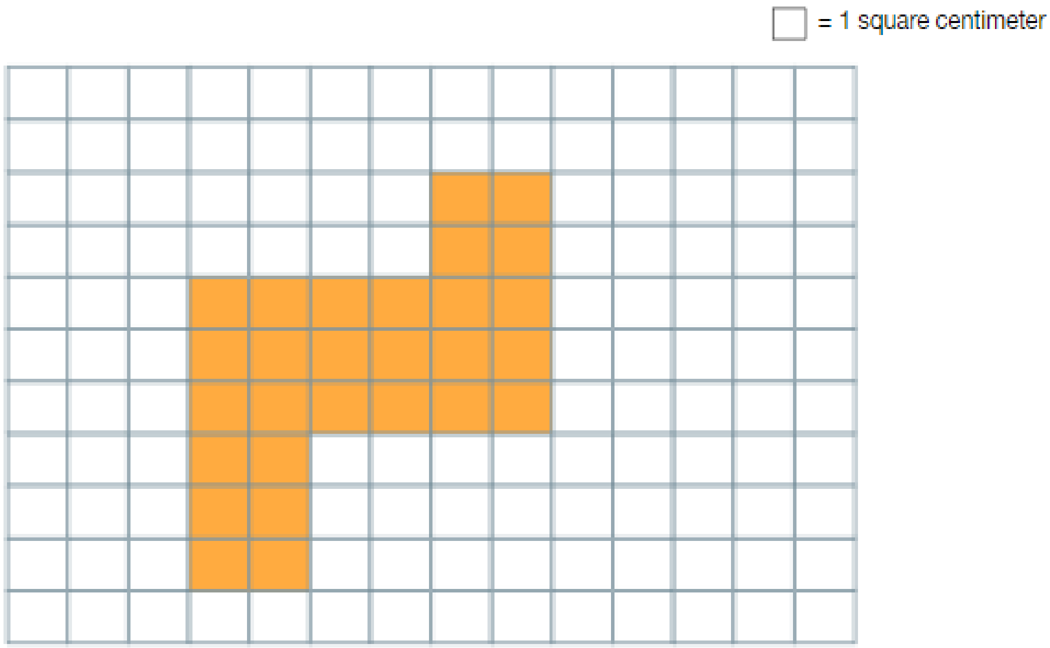
____

Alana draws a chalk design on brick.

What is the area of the whole design? Show your work.

Name: ______________________________________ G3 U3 Lesson 9 - Let's Try It

Let's find the area of a shape made out of rectangles below by decomposing the shape into smaller rectangles.



1. Draw 2 lines to decompose this shape into 3 smaller rectangles.

2. Label the side lengths of each rectangle.

3. Find the area of the first rectangle: _________ x ________ = ________ sq cm

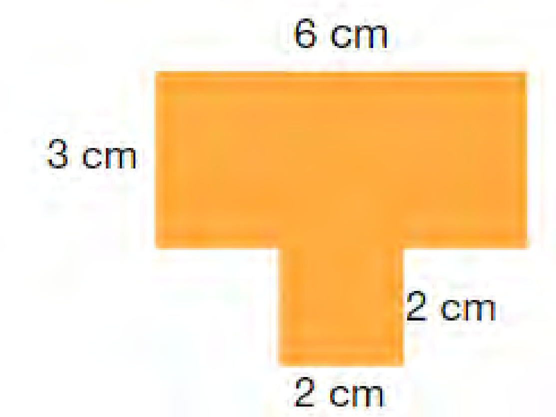
4. Find the area of the second rectangle: _________ x ________ = ________sq cm

5. Find the area of the third rectangle: _________ x ________ = ________sq cm

6. Add the three areas together to find the area of the shape:

_______ sq cm +_______ sq cm + _______ sq cm = _______ sq cm

Let's find the area of a shape made out of rectangles below by decomposing the shape into smaller rectangles.



7. Draw 1 line to decompose this shape into 2 smaller rectangles.

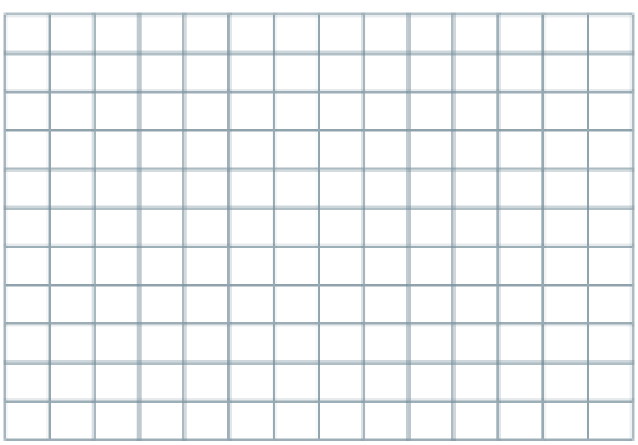
8. Find the area of the first rectangle: _________ x ________ = ________ sq cm

9. Find the area of the second rectangle: _________ x ________ = _______sq cm

10. Add the two areas together to find the area of the shape:

_______ sq cm + _______ sq cm = _______ sq cm

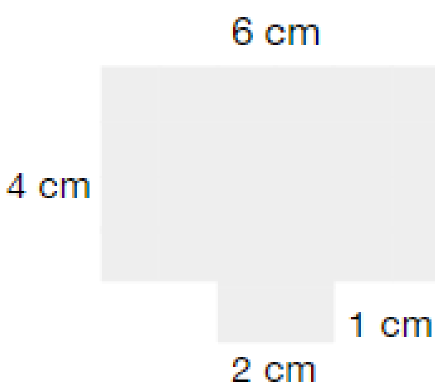
11. Jose's painting includes a shape made out of a rectangle and a square. The rectangle is 6 inches by 5 inches and the square has a side length of 4 inches. Draw one possible image for Jose's painting.



What is the area of Jose's shape? Area = __________________ square inches.

Name:___________________________________ G3 U3 Lesson 9 - Independent Work

I will find the area of a shape made out of rectangles below by decomposing the shape into smaller rectangles.



1. Decompose the shape into 2 smaller rectangles.

2. Find the area of the top rectangle.

   _______ x _______ = _______

3. Find the area of the bottom rectangle.

   _______ x _______ = _______

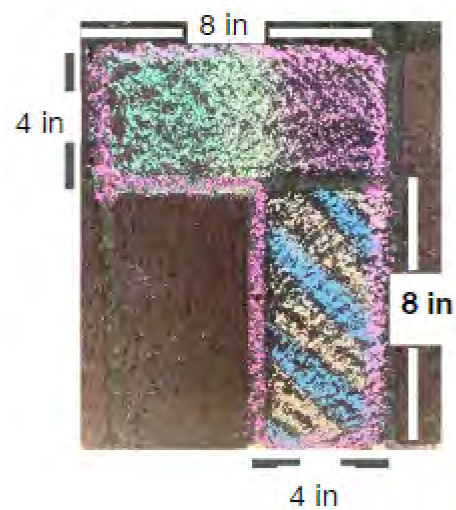
4. Add the areas together

   _______+________=________

5. The area of the whole shape is

   ____

Alana draws a chalk design on brick.



What is the area of the whole design?
Show your work.

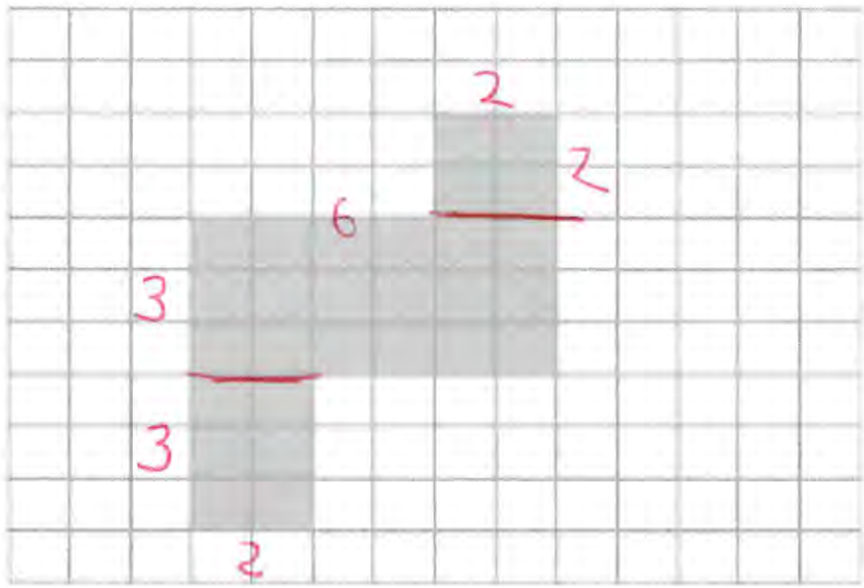
Square Inch Tiles (Grid Paper)

Square Centimeter Tiles (Grid Paper)

Name: ______________________________ G3 U3 Lesson 9 - Let's Try It

We will find the area of a shape made out of rectangles below by decomposing the shape into smaller rectangles.

☐ = 1 square centimeter



1. Draw 2 lines to decompose this shape into 3 smaller rectangles.

2. Label the side lengths of each rectangle.

3. Find the area of the first rectangle: __2__ x __2__ = __4__ sq cm

4. Find the area of the second rectangle: __3__ x __6__ = __18__ sq cm

5. Find the area of the third rectangle: __3__ x __2__ = __6__ sq cm

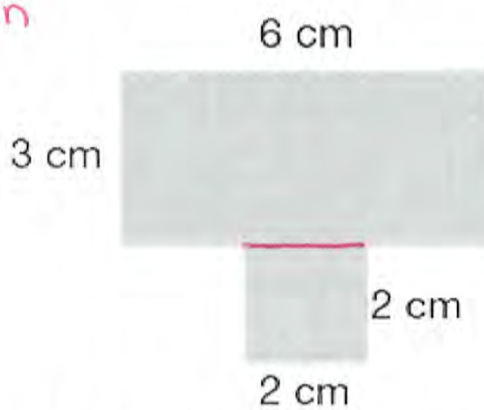
6. Add the three areas together to find the area of the shape:

__4__ sq cm + __18__ sq cm + __6__ sq cm = __28__ sq cm

4+6=10

18+10=28

Note: They can draw this on grid paper if it helps.



7. Draw 1 line to decompose this shape into 2 smaller rectangles.

8. Find the area of the first rectangle: 3 x 6 = 18 sq cm

9. Find the area of the second rectangle: 2 x 2 = 4 sq cm

10. Add the two areas together to find the area of the shape:

18 sq cm + 4 sq cm = 22 sq cm

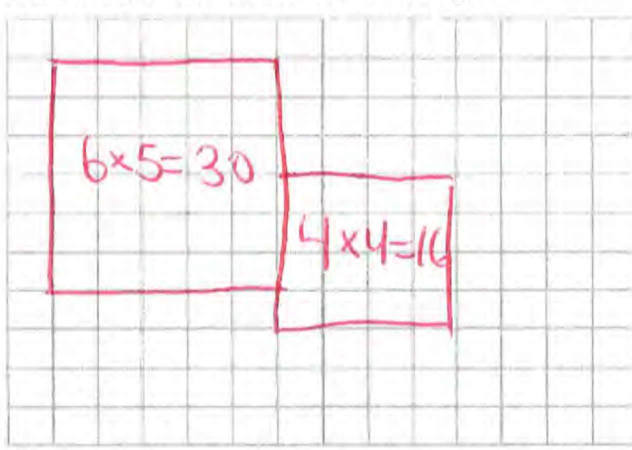
18+4

2 2

20+2=22

11. Jose's painting includes a shape made out of a rectangle and square. The rectangle is 6 inches by 5 inches and the square has a side length of 4 inches. Draw one possible image for Jose's painting.

One example



30+16=46

What is the area of Jose's shape? Area = 46 square inches.

Name:______________________________ G3 U3 Lesson 9 - Independent Work

I will find the area of a shape made out of rectangles below by decomposing the shape into smaller rectangles.

6 cm

4 cm

1 cm

2 cm

1. Decompose the shape into 2 smaller rectangles.

2. Find the area of the top rectangle.

4 x 6 = 24

3. Find the area of the bottom rectangle.

1 x 2 = 2

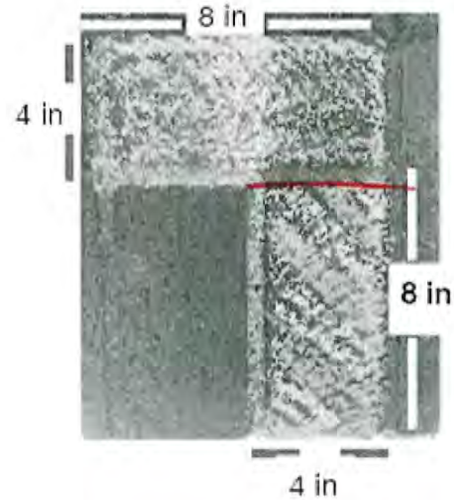
4. Add the areas together

24 + 2 = 26

5. The area of the whole shape is

26 sq. cm

Alana draws a chalk design on brick.



What is the area of the whole design? Show your work.

4x8=32

8x4=32

32+32

60+4=64

Area=64 sq. in.

G3 U3 Lesson 10

Find the area of shapes made out of rectangles by decomposing the shape into smaller rectangles and finding the missing side lengths

G3 U3 Lesson 10 - Students will find the area of shapes made out of rectangles by decomposing the shape into smaller rectangles and finding the missing side lengths

Materials:
- Grid paper for every student

Warm Welcome (Slide 1): Tutor choice.

Let's Review (Slide 2): Yesterday we learned that you can decompose, or break apart shapes into smaller rectangles to help you find the area. Today we will build on this idea but make it a little trickier.

Frame the Learning/Connect to Prior Learning (Slide 3): Today we will find the area of shapes made out of rectangles by decomposing the shape into smaller rectangles, like we did yesterday, but today we're going to have to do some math to find the missing side lengths–it's almost like a scavenger hunt.

Let's Talk (Slide 4): Let's get our brains warm. Take a look at this shape, **what do you notice? What do you wonder?** Possible Student Answers, Key Points:
- It is a shape made out of rectangles.
- There are arrows.
- There are a lot of measurements where there isn't any orange.
- The top side length is missing
- There are a few places we can break apart this shape to make smaller rectangles.
- What do the arrows mean?
- How do I find out the missing side length?
- Why do we know the lengths of the white spaces?

Those are all great noticings and wonderings. Let's go over some important features of this shape that will help us with our work today of finding the area of the whole orange shape.

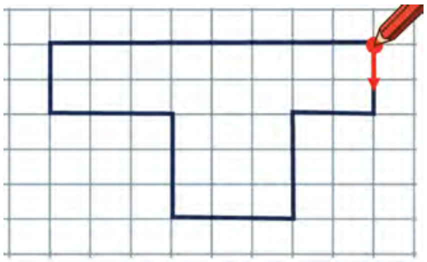
The arrows with the lines on both ends show you the distance of the side length. For example this arrow labeled 2 cm (*point),* shows us if we measured it with a ruler, or filled in the squares and measured the side length, it would be 2 cm long.

But, look, there are some measurements on this picture that are a little tricky. The reason the image has some measurements by white space (*point to the 3 cm along the bottom),* shows us that if we measured this length, it would be 3 cm long. This information can help us because we know opposite side lengths are the same, so if we know this is 3 cm, we also know that this is 3 cm (*point to opposite side length).*

Let's Think (Slide 5): We want to find the area of the orange figure. We know from yesterday we can do what? Break this into smaller rectangles! Yes, we can break the larger shape into smaller rectangles. So let's start with that! Let's say we drew a line here to decompose the shape (*draw horizontal line).* We would then have how many rectangles? Two rectangles! To find the area of this top rectangle we can….? Multiply the side lengths!

But look, this rectilinear figure is missing side lengths. Let's take some time to label the missing side lengths. This requires us to do some math but all of the side lengths are here, we just have to find them and we might have to do a little math. Are you ready? Let's go!

One way we can find the missing side length is to draw the whole shape on grid paper and then use the squares to find the missing length. Using grid paper to find the missing side length and area is the first strategy we will learn about today. Watch me as I draw the shape on this grid paper.

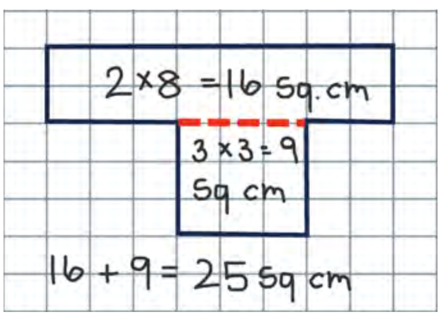


I need to start from the side that I know, and look, we see this right side is 2 cm so I draw 2 lines down.

Now, we need to go left, and we see that the opposite side is labeled as 2 cm. So we need to go left 2 boxes.

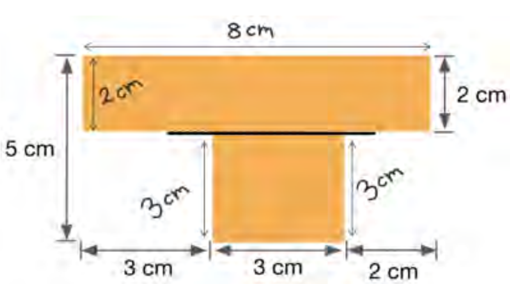
Okay, now we need to go down! To find out how many cm to go down, I need to use some of the information provided. I know that the WHOLE side length will be 5 cm because the opposite whole side length is 5 cm (*point).* I already have 2 cm and I need to make sure the whole length is 5 cm, so I need 3 more cm. That means that this side length will be 3 cm. (*Continue using figure and side lengths to draw the rest of the rectilinear figure.)*

Look, drawing the figure on graph paper helped us find the side lengths, now we can find the area of both rectangles. Let's draw a line to help us split this shape into two rectangles. Let's look at the top rectangle. It's 2 cm by 8 cm, which means we have 2 groups of 8, which is 16 in all!



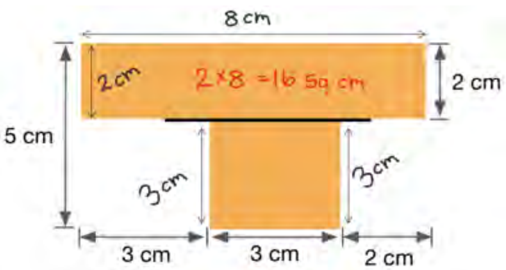
For the bottom rectangle, which I know is a square because all the sides are 3 cm, I see 3 rows of 3. What is 3 x 3? 9! Last, I add the areas of the smaller rectangles together. 16+9 = 25. So the area, or the amount of space the orange shape takes up is, in a complete sentence? The area is 25 square cm.

Let's Think (Slide 6): Great work! To find the missing side lengths and area of this shape you can use the grid paper to help you, but you need to be careful that you draw it correctly. There's another way to find the area of a figure with missing side lengths. Strategy #2 for finding the missing side lengths and area of this shape is to find the side lengths of the larger rectangle. Let me show you what I mean.

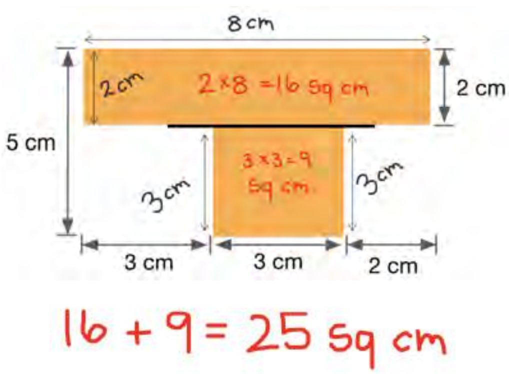


For this image, the first length I have to find is across the top (*trace).* Well look, if I imagine this is a larger rectangle (*trace your fingers around the whole 5 by 8 rectangle)* then I know this side is 5 cm and this side across the top, is the same as this whole length across the bottom (*trace bottom length*). And when we look across the bottom, we see that it's 3 and 3 and 2 more, which is 8 cm. So this side length across the top is 8 cm.

We're still missing some side lengths. We know that this side length is 2 cm because opposite sides are the same. But, we're missing this side length (*point to vertical side length in bottom rectangle*). But, we have information that can help us find the length. We know that the WHOLE length is 5 cm, and this part of it is 2 cm, so 5 cm minus 2 cm is 3 cm. That means that these two side lengths are 3 cm long. Whew, now that we have all of the side lengths, we can find the area! Remember, we can't do any calculating until we find ALL of the side lengths. One way that we can be sure to find the side lengths is to label ALL of them before we do any calculations. Let's check, do we have all of our sides labeled? Yes!



So now we can find the area of this bigger rectangle up top. It has the dimensions of 2 cm by 8 cm, or another way to think of it is 2 groups of 8, which is the same as 2x8, which is 16! So, the area of the top rectangle is 16 square centimeters!



Now let's find the area of the bottom rectangle, which is a square because all of the sides are the same! So, 3 groups of 3, or 3x3 is 9 square centimeters!

Now that we know both areas, what do we need to do next? Add the 2 areas! So,16 sq cm + 9 sq cm = 25 sq cm.

And look, we got the same area for the shape whether we used grid paper or area models to find the area!

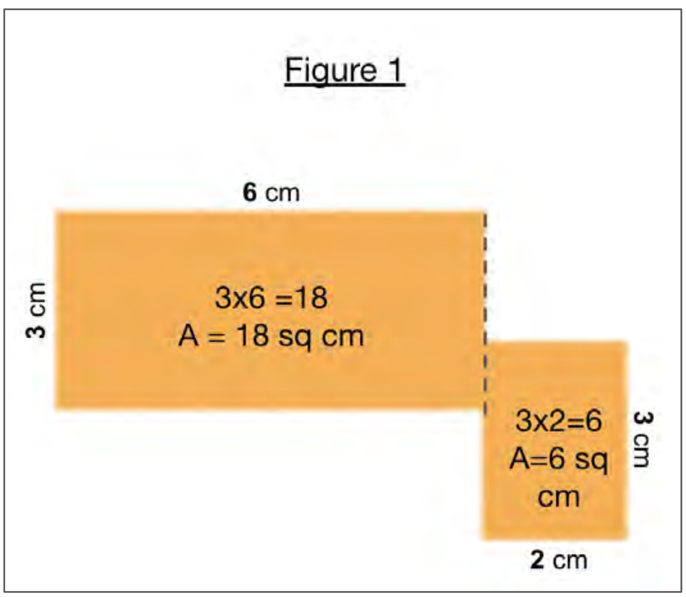
Remember, one strategy is to use the grid paper. The other strategy is to fill in the side lengths of the larger rectangle and use your knowledge of opposite sides of rectangles to help you solve for the missing side lengths. Once we know the sides lengths, we can find the area of the smaller rectangles, and then add the areas to find the area of the whole shape.

Let's Try it (Slides 7-8): Now let's work on decomposing the shapes into rectangles to find the area and finding the missing side length together! Remember, if you choose to use grid paper, make sure you count the spaces carefully so you don't make any mistakes in your model. Also, don't forget, opposite sides of a rectangle are what? Equal! We are going to work on the first page step-by-step.

WARM WELCOME

Let's Review:

We can break apart shapes into smaller rectangles to find the area.



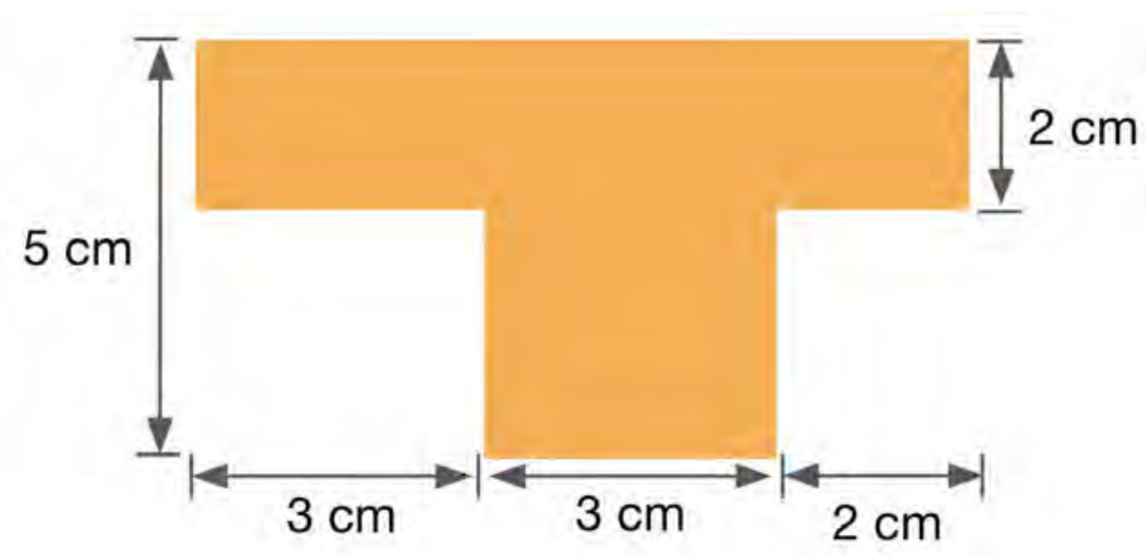
18 sq cm + 6 sq cm = 24 sq cm

Area of Figure 1 = 24 sq cm

Today we will find the area of shapes made out of rectangles by decomposing the shape into smaller rectangles and **finding the missing side lengths.**

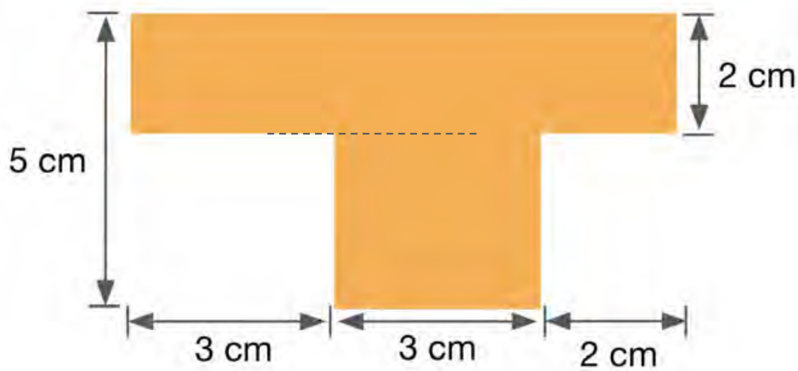
Let's Talk:

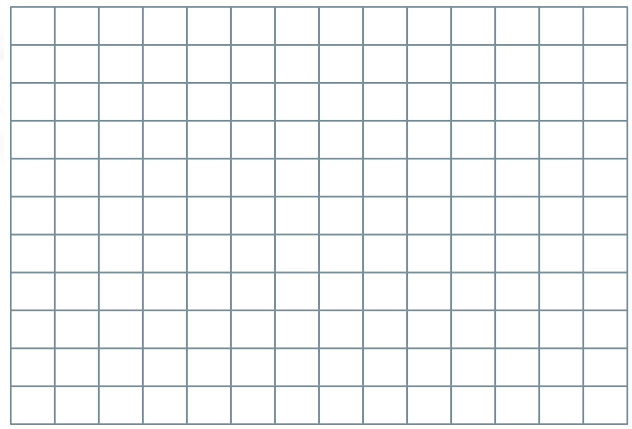
What do you notice? What do you wonder?



Let's Think:

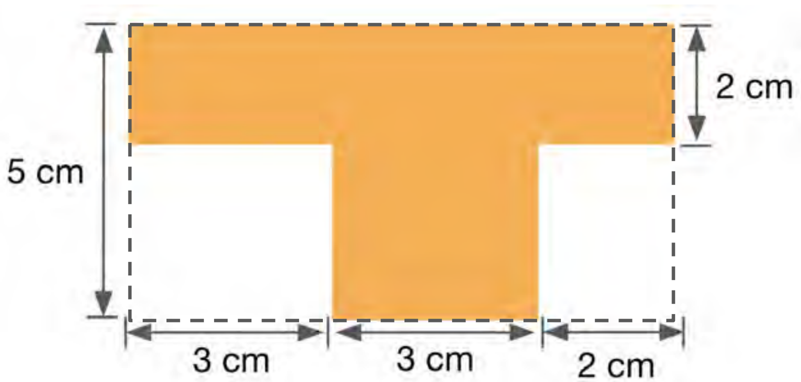
Strategy 1: Draw the shape on grid paper





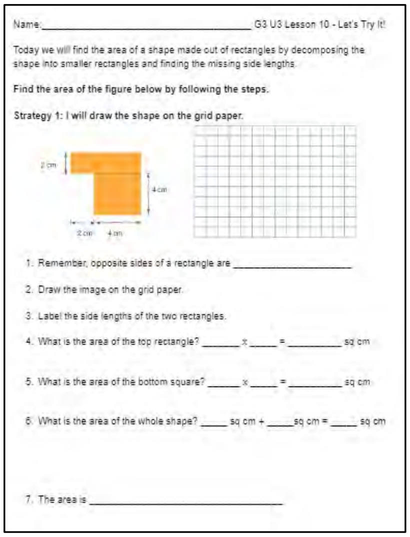
Let's Think:

Strategy 2: Find the side lengths of the larger rectangles.



Let's Try It:

Let's explore decomposing the shapes into rectangles to find the area and find the missing side lengths together!



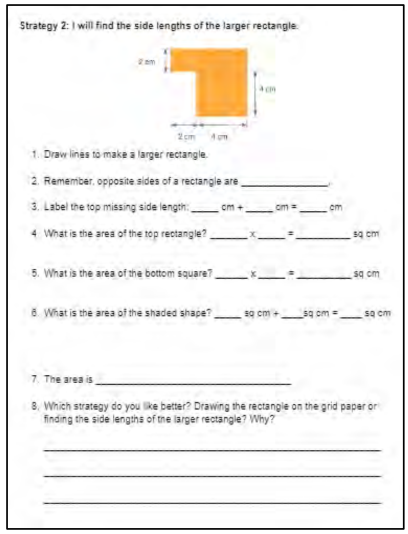
Name:________________________ G3 U3 Lesson 10 - Let's Try It!

Today we will find the area of a shape made out of rectangles by decomposing the shape into smaller rectangles and finding the missing side lengths.

Find the area of the figure below by following the steps.

Strategy 1: I will draw the shape on the grid paper.

1. Remember, opposite sides of a rectangle are ____________
2. Draw the image on the grid paper.
3. Label the side lengths of the two rectangles.
4. What is the area of the top rectangle? ______ x _____ = ________ sq cm
5. What is the area of the bottom square? _____ x _____ = ________ sq cm
6. What is the area of the whole shape? _____ sq cm + _____sq cm = _____ sq cm
7. The area is ____________________



Strategy 2: I will find the side lengths of the larger rectangle.

1. Draw lines to make a larger rectangle.
2. Remember, opposite sides of a rectangle are ____________.
3. Label the top missing side length: _____ cm + _____ cm = _____ cm
4. What is the area of the top rectangle? ______ x _____ = ________ sq cm
5. What is the area of the bottom square? _____ x _____ = ________ sq cm
6. What is the area of the shaded shape? _____ sq cm + ____sq cm = ____ sq cm
7. The area is ____________________
8. Which strategy do you like better? Drawing the rectangle on the grid paper or finding the side lengths of the larger rectangle? Why?

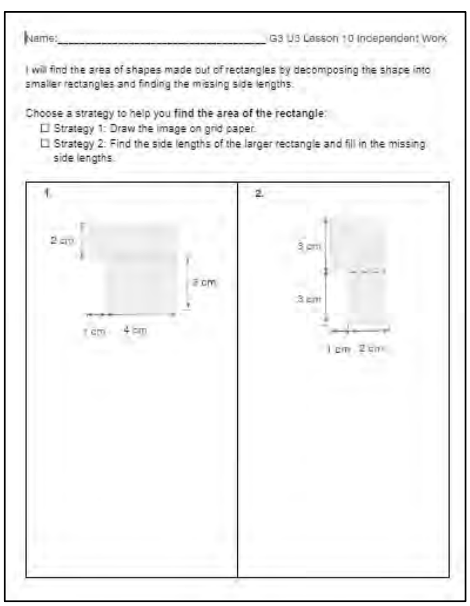
____

____

____

On your Own:

Now you can decompose shapes into rectangles to finding the missing side lengths!



Name:________________________ G3 U3 Lesson 10 Independent Work

I will find the area of shapes made out of rectangles by decomposing the shape into smaller rectangles and finding the missing side lengths.

Choose a strategy to help you **find the area of the rectangle**:

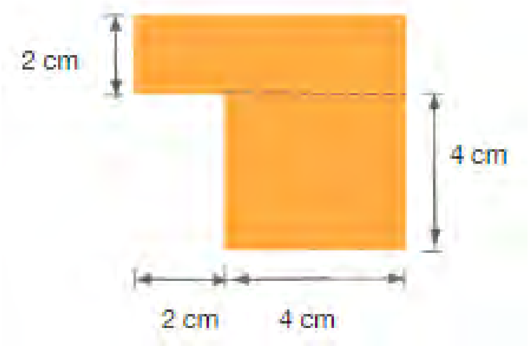
☐ Strategy 1: Draw the image on grid paper.
☐ Strategy 2: Find the side lengths of the larger rectangle and fill in the missing side lengths.

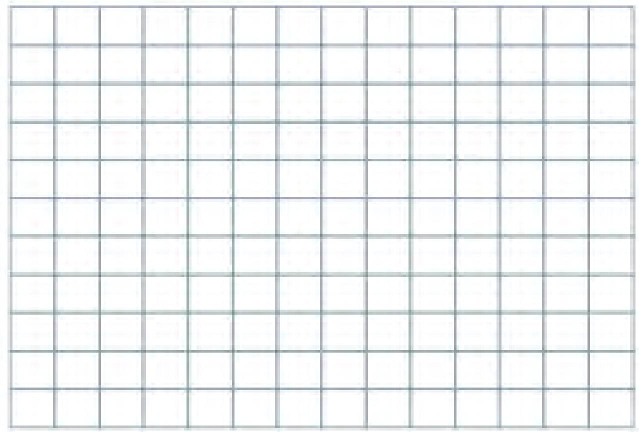
1.

2.

Let’s find the area of the figure below by following the steps.

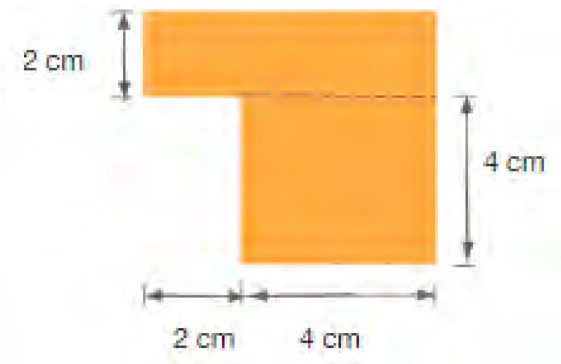
Strategy 1: I will draw the shape on the grid paper.





1. Remember, opposite sides of a rectangle are ______________________.
2. Draw the image on the grid paper.
3. Label the side lengths of the two rectangles.
4. What is the area of the top rectangle? _______ x _____ = __________ sq cm
5. What is the area of the bottom square? ______ x _____ = __________ sq cm
6. What is the area of the whole shape? _____ sq cm + _____sq cm = _____ sq cm
7. The area is ____________________________________

Strategy 2: I will find the side lengths of the larger rectangle.



1. Draw lines to make a larger rectangle.

2. Remember, opposite sides of a rectangle are _______________.

3. Label the top missing side length: _____ cm + _____ cm = _____ cm

4. What is the area of the top rectangle? _______ x _____ = __________ sq cm

5. What is the area of the bottom square? ______ x _____ = __________ sq cm

6. What is the area of the shaded shape? _____ sq cm + ____sq cm = ____ sq cm

7. The area is ____________________________________

8. Which strategy do you like better? Drawing the rectangle on the grid paper or finding the side lengths of the larger rectangle? Why?

____

____

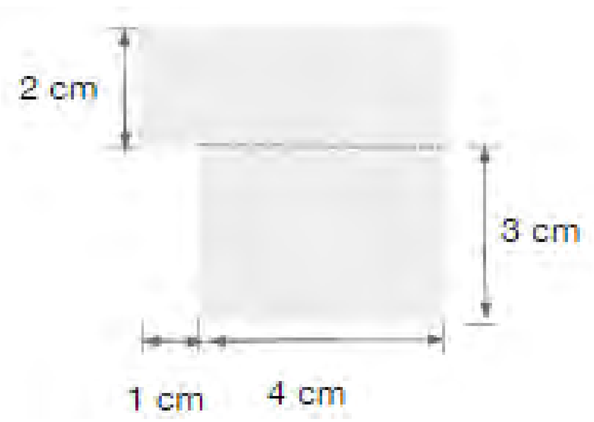
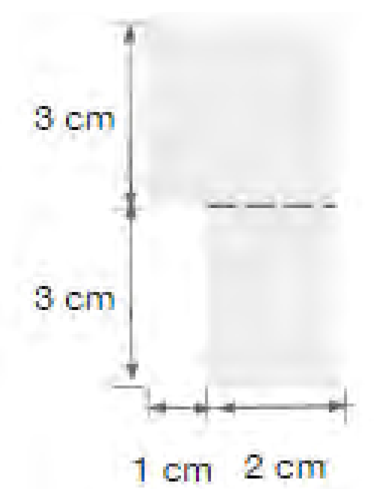
____

Name:___________________________________ G3 U3 Lesson 10 - Independent Work

I will find the area of shapes made out of rectangles by decomposing the shape into smaller rectangles and finding the missing side lengths.

Choose a strategy to help you **find the area of the rectangle**:

- ☐ Strategy 1: Draw the image on grid paper.
- ☐ Strategy 2: Find the side lengths of the larger rectangle and fill in the missing side lengths.

1.	2.
	

Square Inch Tiles (Grid Paper)

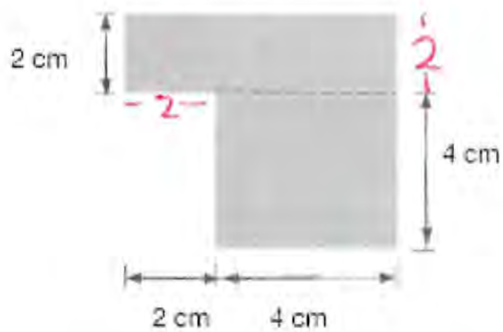
Square Centimeter Tiles (Grid Paper)

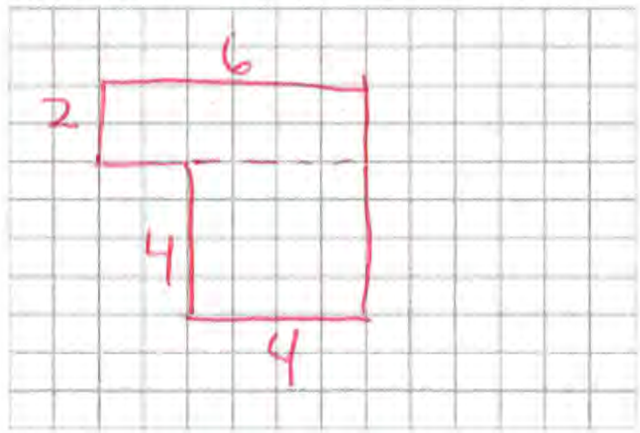
Name:________________________________ G3 U3 Lesson 10 - Let's Try It!

Today we will find the area of a shape made out of rectangles by decomposing the shape into smaller rectangles and finding the missing side lengths.

Find the area of the figure below by following the steps.

Strategy 1: I will draw the shape on the grid paper.





1. Remember, opposite sides of a rectangle are equal.

2. Draw the image on the grid paper.

3. Label the side lengths of the two rectangles.

4. What is the area of the top rectangle? 2 x 6 = 12 sq cm

5. What is the area of the bottom square? 4 x 4 = 16 sq cm

6. What is the area of the whole shape? 12 sq cm + 16 sq cm = 28 sq cm

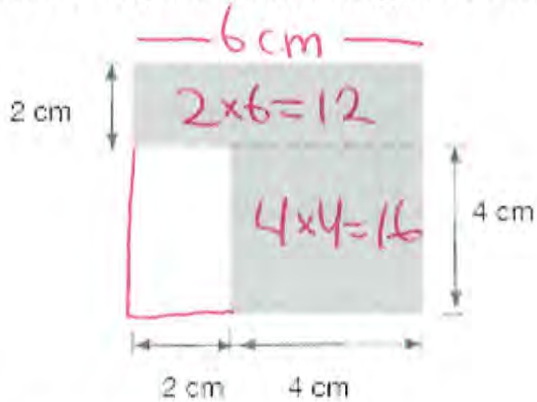
12+16

20+8=28

7. The area is 28 sq cm

Strategy 2: I will find the side lengths of the larger rectangle.

Note: This is the same image as the image on page 1.



1. Draw lines to make a larger rectangle.

2. Remember, opposite sides of a rectangle are equal.

3. Label the top missing side length: 2 cm + 4 cm = 6 cm

4. What is the area of the top rectangle? 2 x 6 = 12 sq cm

5. What is the area of the bottom square? 4 x 4 = 16 sq cm

6. What is the area of the shaded shape? 12 sq cm + 16 sq cm = 28 sq cm

12+16

20+8 = 28

7. The area is 28 sq cm

8. Which strategy do you like better? Drawing the rectangle on the grid paper or finding the side lengths of the larger rectangle? Why?

I like.... because....

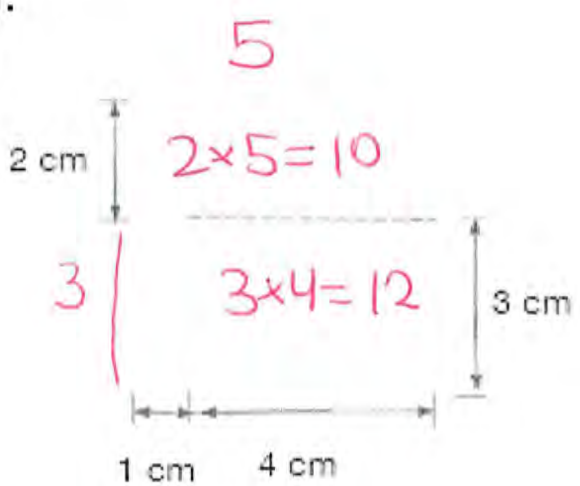
Name:______________________________ G3 U3 Lesson 10 Independent Work

I will find the area of shapes made out of rectangles by decomposing the shape into smaller rectangles and finding the missing side lengths.

Choose a strategy to help you **find the area of the rectangle**:

- ☐ Strategy 1: Draw the image on grid paper.
- ☐ Strategy 2: Find the side lengths of the larger rectangle and fill in the missing side lengths.

1.



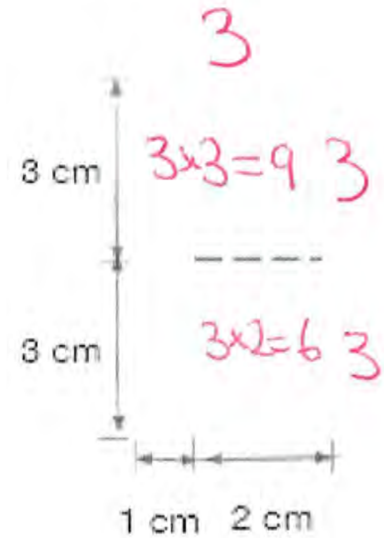
Area top rectangle: 10

Area bottom rectangle: 12

10+12=22

Area of shape=22 sqcm

2.



Area top rectangle: 9

Area bottom rectangle: 6

9+6=15

10 5 1

Area=15 sqcm

G3 U3 Lesson 11

Solve word problems with area

CITYTUTOR DC

G3 U3 Lesson 11 Script - Students will solve word problems with area

Materials:
- [Grid paper]() for every student (optional)

Welcome (Slide 1): Tutor choice.

Let's Review (Slide 2): Wow! We're on our last lesson for our area unit. You've learned so much about area and you will continue to see questions about the area of shapes in math and in your lives. Remind me, what is area? Area is the amount of space a flat (or 2-dimensional) shape takes up! And, we've learned about 3 ways to find the area of a 2-dimensional shape. Who remembers the three ways?
- We can count the tiles to find the area.
- We can find the area by skip counting the rows and or the columns.
- We can find the area by multiplying the side lengths.

And finally, we learned that you can decompose, or break apart rectangles into smaller rectangles, find the area of the smaller rectangles, then add their areas to find the area of the larger rectangle or rectilinear shape.

Frame the Learning/Connect to Prior Learning (Slide 3): And, today for our very last day of exploring area, we will solve word problems where you'll have to find an area, or missing side lengths. You have already been solving word problems throughout the unit, but today we will talk about the steps we can use to solve word problems. We solve word problems in our lives all the time so I know today will be helpful for you.

Let's Talk (Slide 4): Let's warm up our brains. Look at this image. **What do you notice? What do you wonder?**

Those are all great noticings and wonderings. Has anyone ever been to the National Postal Museum? It's a free museum in downtown DC where they teach you all about mail and stamps. It's pretty cool! In the Postal Museum, there is an area for kids where they have this really tall ceiling. We are going to answer an area question about this ceiling. But, before I share my question about this picture, I want you to think. **What is a question you could ask for this image related to what we know about finding area?**

I love all those different ideas! It's amazing how you can have so many different questions for one picture! Thank you for sharing those ideas. Let's look at the problem I came up with.

Let's Think (Slide 5): Here is a question I came up with, listen as I read it, "One of the glass rectangles in the ceiling at the National Postal Museum needs to be replaced, or fixed. The area of the glass rectangle is 24 square feet. One side is 3 feet. What is the other side length?"

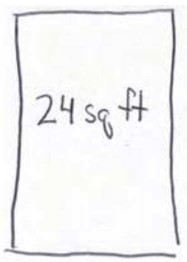
Sometimes when we see word problems we can feel overwhelmed because there are SO many words! Today we will practice using steps that will help solving word problems feel more manageable and not so scary!
- First we will read the problem. We will imagine what's happening in the problem and make a movie in our minds.
- Then we will draw a math picture or math model. This will help us think about how to solve it.
- Then we will write an equation to help us solve. We will solve and then we will write a complete sentence with our answer.
- Finally, we will ask ourselves, "Is the answer reasonable?" That means, does our answer make sense?

What do we need to do first? Read the problem! Listen as I read the problem again. As I read, try to make a movie in your mind and imagine what is happening. *(Read the problem. You can have them close their eyes and make a movie in their minds.)*

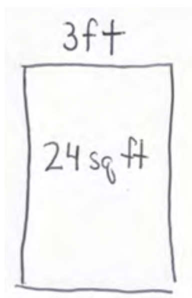
So, what do we know?

- There is a glass rectangle.
- The area of the glass rectangle is 24 square feet.
- One side of the rectangle is 3 feet.
- We are measuring the glass in square feet.

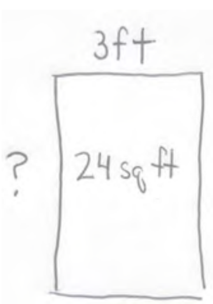
Great! I heard you say we know the glass is a rectangle. We know the area, or the amount of space the glass rectangle takes up is 24 square feet. We know one side length is 3 feet! What do we need to know or what are we trying to figure out? The length of the other side.



Now let's draw a math picture or a math model to help us understand the problem. We have a piece of glass that is a rectangle. We know the area of the rectangle is 24 square feet. Where can we add that in our model? Write 24 square feet inside the rectangle since that means how much space it takes up. Great idea! Let's add that



What else do we know? One side length is 3 feet. Do you think that will be the shorter side length or the longer side length? The shorter side length! Let's label the shorter side length with 3 feet.



And finally, what are we trying to solve for? The other side length. That's right, we are trying to figure out the other side. To show we don't know the side length we can put a question mark on the other side.

$3 \times \_\_ = 24$

$24 \div 3 = \_\_\_$

We draw our math model, or math picture. What's our next step? Write an equation and a complete sentence. Great! Now we get to think about how to solve for the missing number. So we know that 3 times *something* is 24, let me write that. Or, we could try 24 divided by 3 to find the missing side lengths. Both of these equations help us solve for the missing side length! Pick a strategy and find the missing side length (*give students time to solve*). So, what's the missing side length? 8 feet!I can write in a complete sentence: The missing side length is 8 feet.

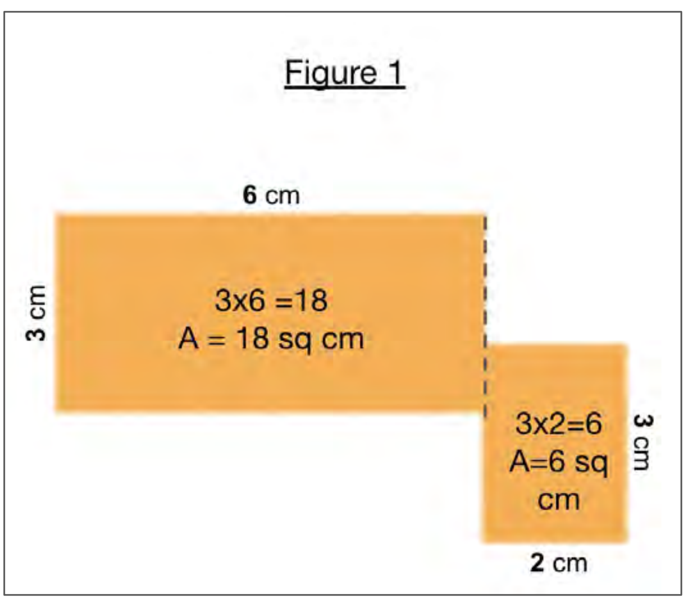
The very last thing we need to do is make sure our answer is reasonable, or makes sense. In our model we have a rectangle with a length of 3 feet and a length of 8, and an area that's 24 sq ft. Hmm, well 3x8 is 24, let's double check (*do the math to check*). So, yes that answer sounds reasonable!

Let's Try it (Slides 7-8): Now let's work on solving word problems with area! Remember, the first step to solving a word problem is thinking about what we know and don't know and imagining the problem in our minds. Drawing a picture or math model is so helpful and very important! We are going to work on the first page step-by-step.

WARM WELCOME

Let's Review:

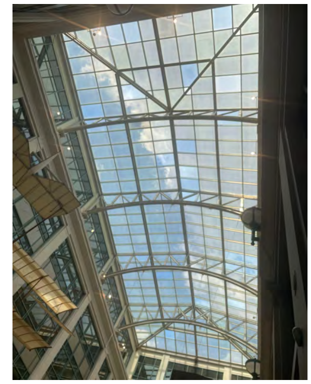
We can break apart shapes into smaller rectangles to find the area.

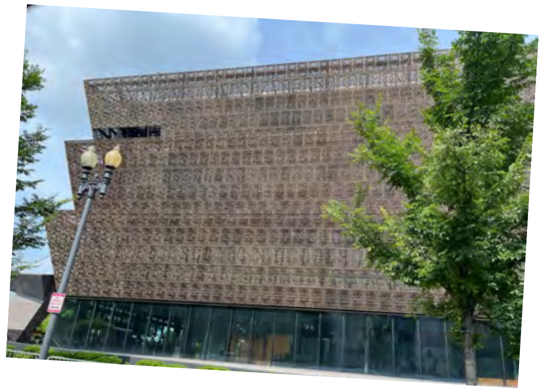


18 sq cm + 6 sq cm = 24 sq cm

Area of Figure 1 = 24 sq cm

Today we will solve word problems with area.





Let's Talk:

What do you notice? What do you wonder?

What is a question you could ask for this image about area?

Let's Think:

One of the glass rectangles in the ceiling at the National Postal Museum needs to be replaced. The area of the glass rectangle is 24 square feet. One side is 3 feet. What is the other side length?

- ❏ **Read the problem**
- ❏ **Draw a math picture or math model**
- ❏ **Write an equation and complete sentence**
- ❏ **Ask: Is the answer reasonable?**

Let's Think:

The area of the glass rectangle is 24 square feet. One side is 3 feet. What is the other side length?

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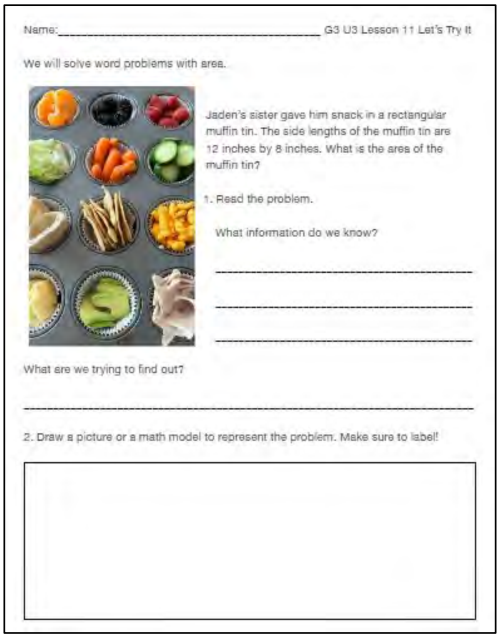
Let's Try It:

Let's solve word problems with area together!



Name:______________________ G3 U3 Lesson 11 Let's Try It

We will solve word problems with area.

Jaden's sister gave him snack in a rectangular muffin tin. The side lengths of the muffin tin are 12 inches by 8 inches. What is the area of the muffin tin?

1. Read the problem.

What information do we know?

____

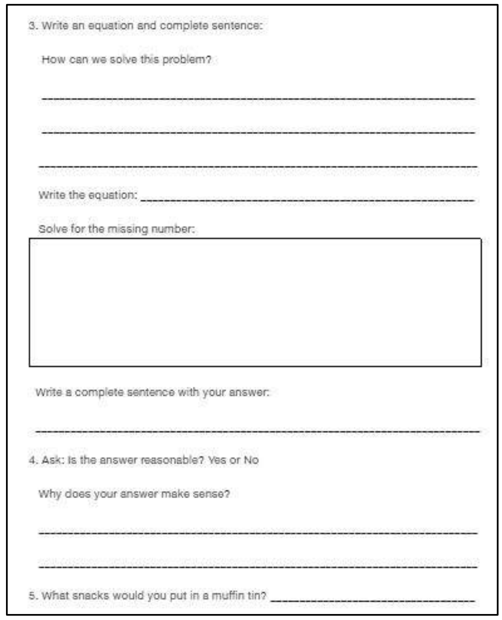
____

____

What are we trying to find out?

____

2. Draw a picture or a math model to represent the problem. Make sure to label!



3. Write an equation and complete sentence:

How can we solve this problem?

____

____

____

Write the equation: ______________________

Solve for the missing number:

Write a complete sentence with your answer:

____

4. Ask: Is the answer reasonable? Yes or No

Why does your answer make sense?

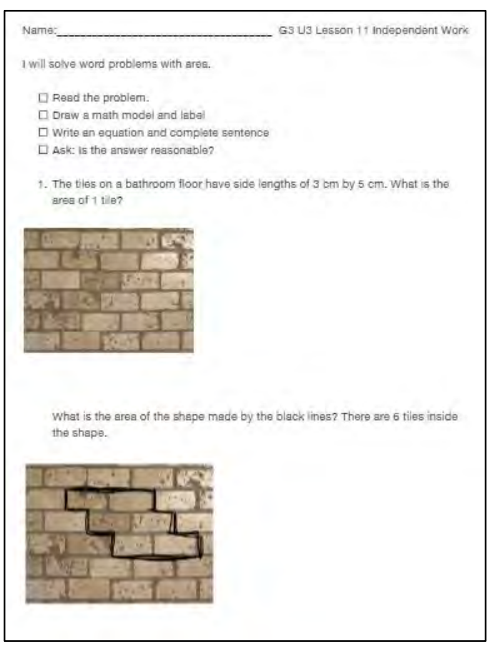
____

____

5. What snacks would you put in a muffin tin? ______________________

On your Own:

Now you can solve word problems with area on your own!



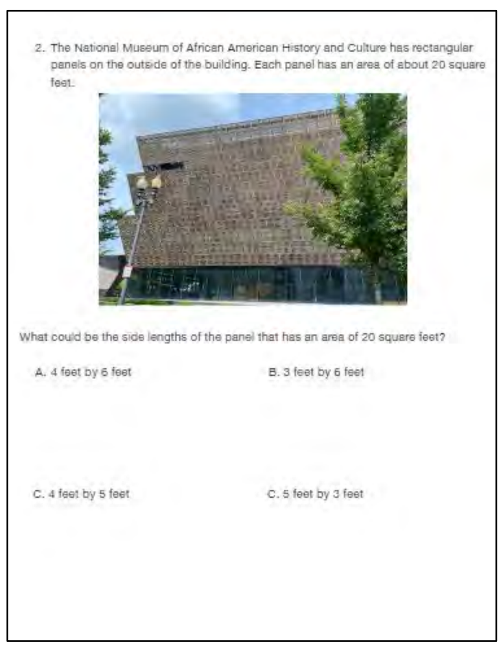
Name:______________________ G3 U3 Lesson 11 Independent Work

I will solve word problems with area.

- ☐ Read the problem.
- ☐ Draw a math model and label
- ☐ Write an equation and complete sentence
- ☐ Ask: Is the answer reasonable?

1. The tiles on a bathroom floor have side lengths of 3 cm by 5 cm. What is the area of 1 tile?

What is the area of the shape made by the black lines? There are 6 tiles inside the shape.



2. The National Museum of African American History and Culture has rectangular panels on the outside of the building. Each panel has an area of about 20 square feet.

What could be the side lengths of the panel that has an area of 20 square feet?

A. 4 feet by 6 feet

B. 3 feet by 6 feet

C. 4 feet by 5 feet

C. 5 feet by 3 feet

Name:____

Jaden's sister gave him a snack in a rectangular muffin tin. The side lengths of the muffin tin are 12 inches by 8 inches. What is the area of the muffin tin?

1. What information do we know?

____

____

2. What are we trying to find out?

____

____

3. Draw a picture or a math model to represent the problem. Make sure to label!

5. Write the equation: ____

6. Solve for the missing number:

7. Why does your answer make sense?

____

____

8. What snacks would you put in a muffin tin? ______________________________

Name:___________________________________ G3 U3 Lesson 11 - Independent Work

I will solve word problems with area.

- ☐ Read the problem.
- ☐ Draw a math model and label
- ☐ Write an equation and complete sentence
- ☐ Ask: Is the answer reasonable?

1. Each tile on a bathroom floor has a side length of 3 cm by 5 cm. What is the area of one tile?

2. What is the area of the shape made by the black lines? There are 6 tiles inside the shape.

3. The National Museum of African American History and Culture has rectangular panels on the outside of the building. Each panel has an area of about 20 square feet. What could be the side lengths of the panel that has an area of 20 square feet?

   a. 4 feet by 6 feet
   b. 3 feet by 6 feet
   c. 4 feet by 5 feet
   d. 5 feet by 3 feet

Square Inch Tiles (Grid Paper)

Square Centimeter Tiles (Grid Paper)

Name:________________________________ G3 U3 Lesson 11 Independent Work

I will solve word problems with area.

- ☐ Read the problem.
- ☐ Draw a math model and label
- ☐ Write an equation and complete sentence
- ☐ Ask: Is the answer reasonable?

1. The tiles on a bathroom floor have side lengths of 3 cm by 5 cm. What is the area of 1 tile?

3 rows of 5

$3 \times 5 = 15$

Area of 1 tile = 15 sq cm

What is the area of the shape made by the black lines? There are 6 tiles inside the shape.

15+15+15+15+15+15

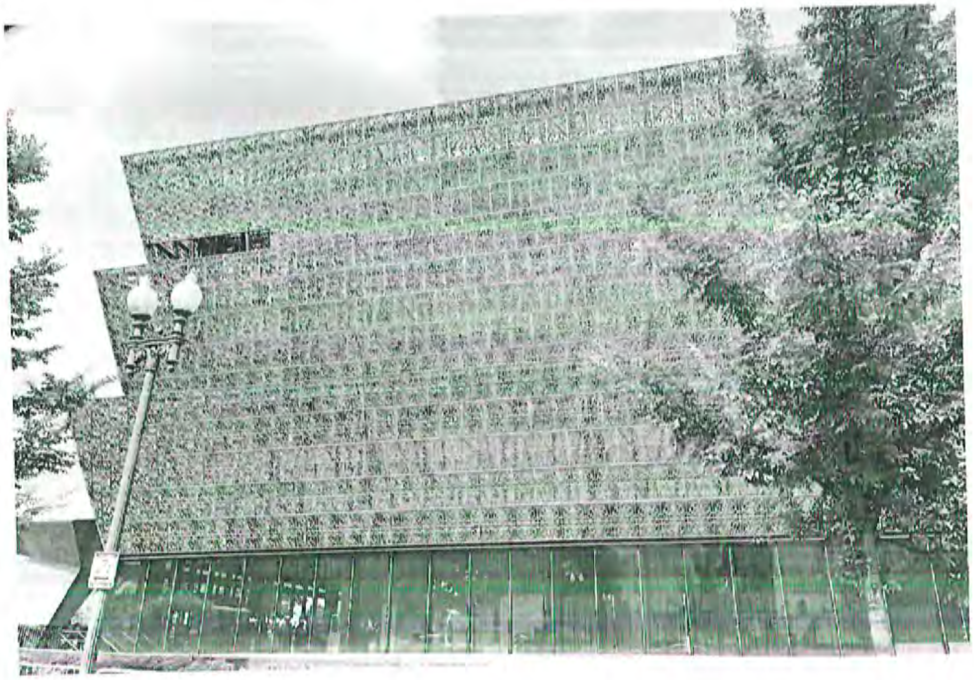
30 30 30

60

$60+30=90$

Area of shape = 90 sq cm

2. The National Museum of African American History and Culture has rectangular panels on the outside of the building. Each panel has an area of about 20 square feet.



What could be the side lengths of the panel that has an area of 20 square feet?

~~A. 4 feet by 6 feet~~

$4 \times 6 = 24$

~~B. 3 feet by 6 feet~~

$3 \times 6 = 18$

C. 4 feet by 5 feet

$4 \times 5 = 20$

~~C. 5 feet by 3 feet~~

$5 \times 3 = 18$

Note: Students can use grid paper to help them find the areas.

CITYTUTOR DC

G3 Unit 4:

Exploring Fractions as Numbers

G3 U4 Lesson 1

Partition a whole into equal parts and name unit fractions with words using concrete models

CITYTUTOR DC

G3 U4 Lesson 1 - Partition a whole into equal parts and name unit fractions with words using concrete models

Warm Welcome (Slide 1): Tutor choice.

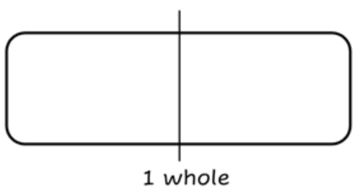
Frame the Learning/Connect to Prior Learning (Slide 2): Today we will explore partitioning, or *dividing*, a whole into **equal parts**. We do this at birthday parties, sleepovers, holiday family gatherings, and so many more places. We do it whenever we want to share something equally with other people! When we partition one whole into **equal** pieces, we create a **fraction** of the whole. Let me show you what I mean.

Let's Talk (Slide 3): Here we have a Snickers bar. **If I wanted to share this Snickers bar among me and my three friends, could I?** I only have 1 bar, though! Possible Student Answers, Key Points:

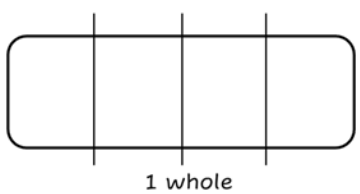
- Yes, you can break it up! You would each get a piece because you only have one Snickers bar!
- Yes, you can cut it into smaller pieces. It wouldn't be a whole bar anymore because you cut it to share.

Let's Think (Slide 4): So, we know that we can share it, now we need to make sure that they're **equal** pieces. We don't want to be unfair when we share–we want to make sure all of the pieces are the exact same side! I'm going to make a drawing of my Snickers bar to make sure I *divide* it into equal pieces, I'll just draw a bar model, not an actual picture of a snickers.

I'm going to start with my one Snickers bar. I'm going to label it, so it's easy to identify what it is - and to remind myself that I'm starting with **one whole**.

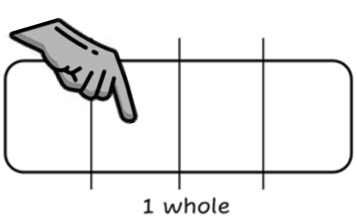


I want to share the **whole** with four people - me and my three friends (*count total on fingers*). That's four pieces total. So, I need to cut it into **equal** pieces. I'm going to start by cutting it in **half, that's 1, 2 equal pieces**.



Now, I can divide each **half** into two pieces. This helps me to make sure my pieces are the same size. Now, I have (*point to each piece and count*) 1, 2, 3, 4 pieces of Snickers! Do they look equal? Am I being fair to everyone?

Now that I've split my bar into four **equal** pieces, I can give everyone **one** piece. Remember at the beginning of the lesson I introduced the word **fraction**? Well, here's where we use it. There's a name for the **size** of each of these pieces that I've cut - the name is determined by how many pieces there are in one whole.



When I cut something into fourth equal sized pieces, I cut the whole into fourths. So, each of these pieces are **one-fourth** of the Snickers bar. (*Point to each of the pieces as you name it "one-fourth" to emphasize each piece)* It's called **one-fourth** because it's **<u>one</u> of <u>four</u> pieces** that I cut. The size of the piece is **one-fourth** of the Snickers bar. We have **one** piece out of the **four pieces** we made. When we use fractions to describe something, we're letting people know the **size of the piece** we're describing. Let's try this together.

Let's Think (Slide 5): There are special names for different **size** pieces. Let me show you what I mean. How many Snicker pieces are there in this picture? Two! When a whole is split into two equal sized pieces, the size of the piece is called **halves**. *(Write the word under the Snickers. Then, have students repeat "halves" after* *you.)* So, what would we call just **one** piece out of the two we made? One-half. And let's count how many halves are in 1 whole…1 half, 2 halves (*point and count*). So, 2 halves are in 1 whole.

Let's Think (Slide 6): Look at this candy bar, it's split into more many pieces! How many equal-sized pieces are there in this picture? Four! When we have four pieces of a whole, the size of the piece is called **fourths**. *(Write the word out under the four pieces of Snickers.* So, what would the size be for just **one** piece out of the four we made? One-fourth. And let's count how many fourths are in 1 whole…1 fourth, 2 fourths, 3 fourths, 4 fourths (*point and count*). So, 4 fourths are in 1 whole.

Let's Think (Slide 7): Wow, look how many pieces there are here! The pieces are getting smaller and smaller. Let's count how many equal-sized pieces this Snickers is partitioned into? Count carefully! Eight! When we have **eight** pieces of a whole, the size of the piece is called **eighths**. *(Write the word out under the eight pieces. Then, have students repeat "eighths".)* So, what would the size be for just **one** piece out of the eight we made? One-eighth. And, let's count how many eighths are in 1 whole…1 eighths, 2 eights, etc. So, 8 eighths are in 1 whole.

What did you notice as the pieces went from halves to eighths? What happened to the size? Possible Student Answers, Key Points:

- The pieces got smaller the more pieces of Snickers bars we made.
- The numbers got bigger, but the size of the pieces got smaller!

Note: This last part is not imperative for students to get on their own. This will come later in the unit. If students don't pick up on the pattern, just tell them and move on. "The pieces actually get smaller the more pieces we cut! Halves are bigger than eighths because to make eighths we cut the bar more times so the pieces got smaller."

Let's Think (Slide 8): Before we move on to our practice, let's take a look at this Snickers bar. **This isn't a fraction. Can you tell why?** Possible Student Answers, Key Points:

- They're not in equal pieces - fractions have to be equal sizes!
- Fractions are a whole cut into equal size pieces and these are all different sizes.

Let's Try it (Slides 9-10): So, today, as we practice, let's make sure we're making our pieces into **equal** sizes and then using the right fraction name for the size of the pieces we cut! Remember, the fraction name comes from how many equal sized pieces there are in 1 whole. Lastly, don't forget to use our cutting strategy - cut the whole in half and then cut it in half again until you have the right amount of equal pieces! Let's try it together!

WARM WELCOME

Today we will explore partitioning a whole into equal parts and naming unit fractions with words using concrete models.

Let's Talk:

Is it possible to share ONE bar of candy with *four* different people?

Let's Think:

How would we take ONE bar of candy and share it EQUALLY with four people?

How much of the candy bar would each person get?

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Let's Think:

Each **size** that's cut has a **special name**!

Let's Think:

Each **size** that's cut has a **special name**!

Let’s Think:

Each **size** you cut has a **different name**!

Let’s Think:

This ISN’T a fraction!

Can you tell why?

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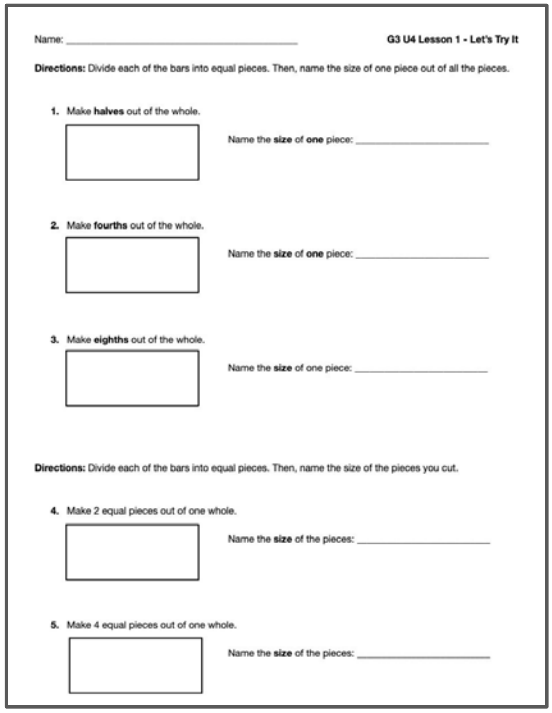
Let's Try It:


Name: ______________________ **G3 U4 Lesson 1 - Let's Try It**

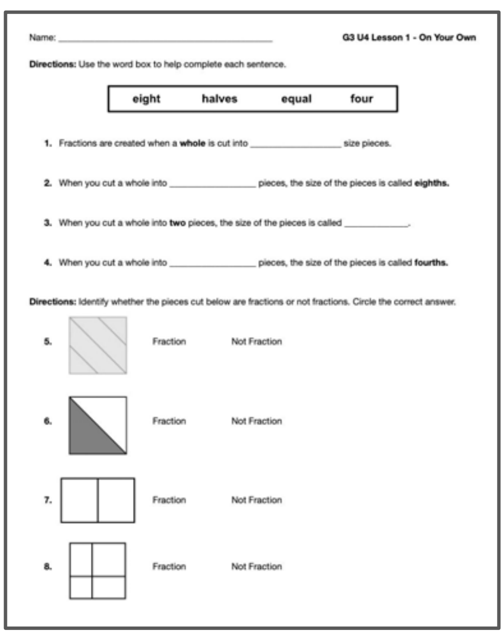
Directions: Divide each of the bars into equal pieces. Then, name the size of one piece out of all the pieces.

1. Make **halves** out of the whole. Name the **size** of **one** piece: ______________
2. Make **fourths** out of the whole. Name the **size** of **one** piece: ______________
3. Make **eighths** out of the whole. Name the **size** of one piece: ______________

Directions: Divide each of the bars into equal pieces. Then, name the size of the pieces you cut.

4. Make 2 equal pieces out of one whole. Name the **size** of the pieces: ______________
5. Make 4 equal pieces out of one whole. Name the **size** of the pieces: ______________

On your Own:


Name: ______________________ **G3 U4 Lesson 1 - On Your Own**

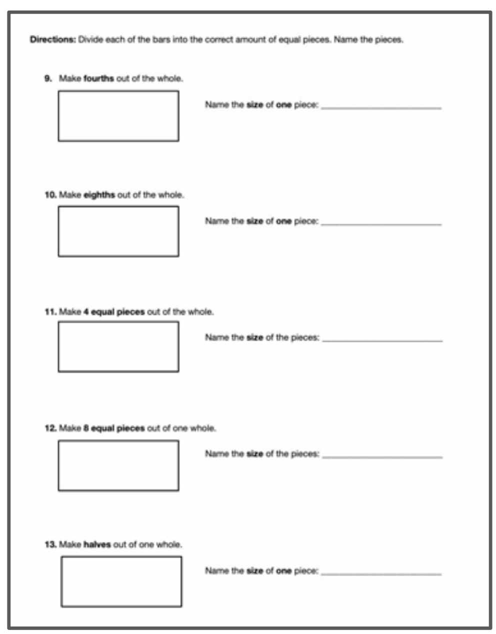
Directions: Use the word box to help complete each sentence.

eight	**halves**	**equal**	**four**

1. Fractions are created when a **whole** is cut into ______________ size pieces.
2. When you cut a whole into ______________ pieces, the size of the pieces is called **eighths.**
3. When you cut a whole into **two** pieces, the size of the pieces is called ____________.
4. When you cut a whole into ______________ pieces, the size of the pieces is called **fourths.**

Directions: Identify whether the pieces cut below are fractions or not fractions. Circle the correct answer.

5. Fraction Not Fraction
6. Fraction Not Fraction
7. Fraction Not Fraction
8. Fraction Not Fraction


Directions: Divide each of the bars into the correct amount of equal pieces. Name the pieces.

9. Make **fourths** out of the whole. Name the **size** of **one** piece: ______________
10. Make **eighths** out of the whole. Name the **size** of **one** piece: ______________
11. Make **4 equal pieces** out of the whole. Name the **size** of the pieces: ______________
12. Make **8 equal pieces** out of one whole. Name the **size** of the pieces: ______________
13. Make **halves** out of one whole. Name the **size** of **one** piece: ______________

Name: ____ G3 U4 Lesson 1 - Let's Try It

Directions: Divide each of the bars into equal pieces. Then, name the size of one piece out of all the pieces.

1. Make **halves** out of the whole.

Name the **size** of **one** piece: _________________________

2. Make **fourths** out of the whole.

Name the **size** of **one** piece: _________________________

3. Make **eighths** out of the whole.

Name the **size** of one piece: _________________________

Directions: Divide each of the bars into equal pieces. Then, name the size of the pieces you cut.

4. Make 2 equal pieces out of one whole.

Name the **size** of the pieces: _________________________

5. Make 4 equal pieces out of one whole.

Name the **size** of the pieces: _________________________

Name: ____ G3 U4 Lesson 1 - Independent Work

Directions: Use the word box to help complete each sentence.

eight	**halves**	**equal**	**four**

1. Fractions are created when a **whole** is cut into ___________________ size pieces.

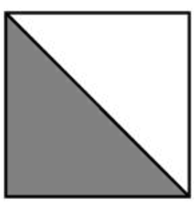
2. When you cut a whole into __________________ pieces, the size of the pieces is called **eighths.**

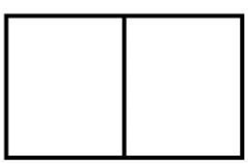
3. When you cut a whole into **two** pieces, the size of the pieces is called _____________.

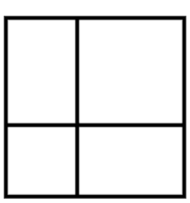
4. When you cut a whole into __________________ pieces, the size of the pieces is called **fourths.**

Directions: Identify whether the pieces cut below are fractions or not fractions. Circle the correct answer.

5.  Fraction Not Fraction

6.  Fraction Not Fraction

7.  Fraction Not Fraction

8.  Fraction Not Fraction

Directions: Divide each of the bars into the correct amount of equal pieces. Name the pieces.

9. Make **fourths** out of the whole.

Name the **size** of **one** piece: ____________________________

10. Make **eighths** out of the whole.

Name the **size** of **one** piece: ____________________________

11. Make **4 equal pieces** out of the whole.

Name the **size** of the pieces: ____________________________

12. Make **8 equal pieces** out of one whole.

Name the **size** of the pieces: ____________________________

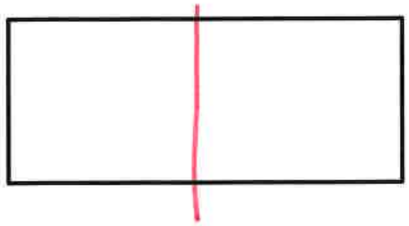
13. Make **halves** out of one whole.

Name the **size** of **one** piece: ____________________________

Name: ANSWER KEY

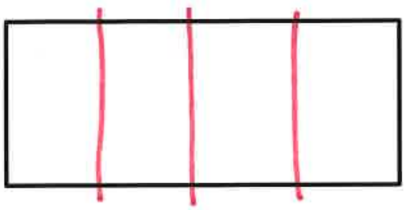
Directions: Divide each of the bars into equal pieces. Then, name the size of one piece out of all the pieces.

1. Make **halves** out of the whole.



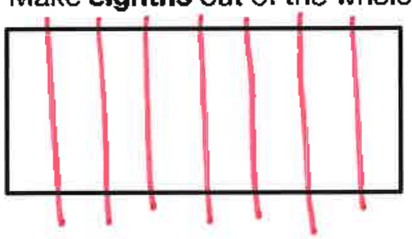
Name the **size** of **one** piece: one-half

2. Make **fourths** out of the whole.



Name the **size** of **one** piece: one-fourth

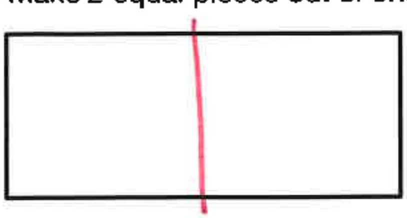
3. Make **eighths** out of the whole.



Name the **size** of one piece: one-eighth

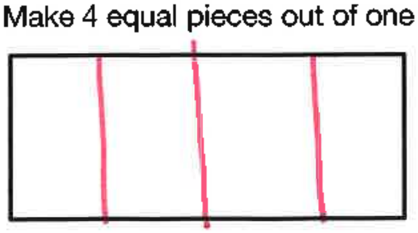
Directions: Divide each of the bars into equal pieces. Then, name the size of the pieces you cut.

4. Make 2 equal pieces out of one whole.



Name the **size** of the pieces: halves

5. Make 4 equal pieces out of one whole.



Name the **size** of the pieces: fourths

Name: ANSWER KEY

Directions: Use the word box to help complete each sentence.

eight	**halves**	**equal**	**four**

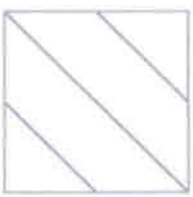
1. Fractions are created when a **whole** is cut into equal size pieces.

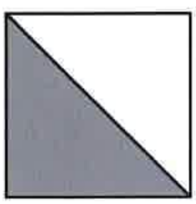
2. When you cut a whole into eight pieces, the size of the pieces is called **eighths.**

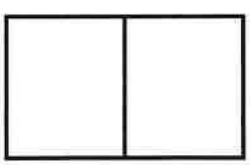
3. When you cut a whole into **two** pieces, the size of the pieces is called halves.

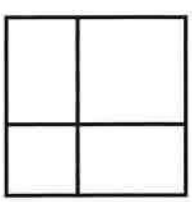
4. When you cut a whole into four pieces, the size of the pieces is called **fourths.**

Directions: Identify whether the pieces cut below are fractions or not fractions. Circle the correct answer.

5.  Fraction   Not Fraction

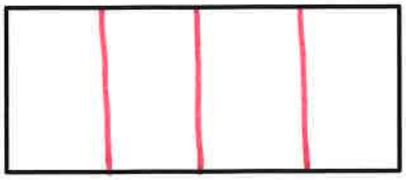
6.  Fraction   Not Fraction

7.  Fraction   Not Fraction

8.  Fraction   Not Fraction

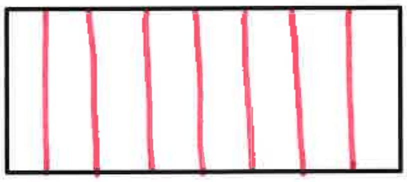
Directions: Divide each of the bars into the correct amount of equal pieces. Name the pieces.

9. Make **fourths** out of the whole.



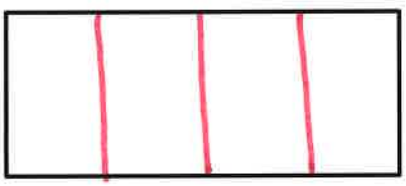
Name the **size** of **one** piece: one-fourth

10. Make **eighths** out of the whole.



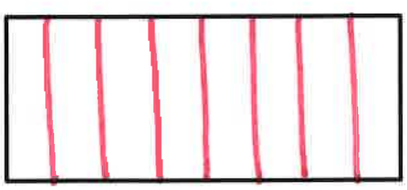
Name the **size** of **one** piece: one-eighth

11. Make **4 equal pieces** out of the whole.



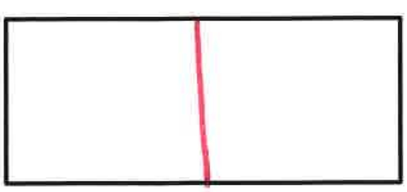
Name the **size** of the pieces: fourths

12. Make **8 equal pieces** out of one whole.



Name the **size** of the pieces: eighths

13. Make **halves** out of one whole.



Name the **size** of **one** piece: one-half

G3 U4 Lesson 2

Partition a whole into equal parts and name unit fractions with fractional notation

G3 U4 Lesson 2 - Partition a whole into equal parts and name unit fractions with fractional notation

Warm Welcome (Slide 1): Tutor choice.

Let's Review (Slide 2): In the last lesson, we wrote fraction names in words and split them into halves, fourths, and eighths. Remember, when we partition one whole into equal pieces, we create a **fraction** of the whole and we name that fraction based on how many pieces there are in 1 whole. Let's get our brains ready with a quick review.

- Look at A - How many pieces are there in 1 whole? Two! When there are two equal sized pieces in one whole, what is each piece called? One half! And finally, how many halves are in 1 whole? Two halves!
- Look at B - How many pieces are there in 1 whole? Four! When there are four equal sized pieces in one whole, what is each piece called? One fourth! And finally, how many fourths are in 1 whole? Four fourths!
- Look at C - How many pieces are there in 1 whole? Eight! When there are eight equal sized pieces in one whole, what is each piece called? One eighth! And finally, how many halves are in 1 whole? Eight eighths!

Frame the Learning/Connect to Prior Learning (Slide 3): Today we will continue partitioning, or dividing, a whole into **equal parts**. Today, we're going to use fractional notation - so writing fractions with **numbers** and split them into different size pieces like thirds and sixths!

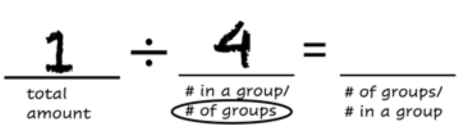
Let's Talk (Slide 4): Before we start, I've been describing this work as **dividing** pieces. **How does creating fraction pieces remind you of division?** Possible Student Answers, Key Points:

- When we make fractions, we cut pieces into equal sizes and in division we create equal sized groups.
- Both division and fractions are creating equal sized groups, like in one-fourth we have one equal group out of 4 pieces.

Note: *If students have a hard time seeing the relationship, circle each of the Snickers pieces on the slide to show 4 groups of 1 - the 1 being the 1 piece of the Snickers bar.*

Let's Think (Slide 5): So, if we know that fractions are just another form of division, let's think about how we can write a division equation for dividing 1 Snickers bar into 4 pieces?

Let's start with what we know about division. A division equation is made up of your total number of items and then you divide that by the number of groups you want to create or the number of items in each group you need to make.



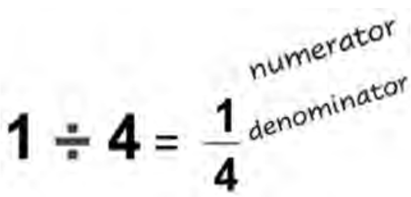
So, if I have 1 whole bar of Snickers and I want to split it with me and my three friends, how many groups of Snickers am I creating? Let's plug our numbers into our division equation. (*Make sure students understand that it is 4 groups because each person is one group, 4 people = 4 groups.)*

Before we solve for our answer, let's think: **will our answer be greater than, equal to, or less than one whole?** Possible Student Answers, Key Points:

- It will be less than one whole because we're sharing one Snickers bar with four people.
- It has to be less because we don't have 4 whole Snickers bars to share with four people. We only have one that we have to cut into 4 pieces.

So, our answer is *less than* one whole, which means that the number we write needs to reflect that.

Yesterday we practiced cutting 1 whole into 4 equal pieces. When we did that, we called each piece one fourth. I want to show you how to write one fourth with numbers, called a fraction. The answer to our division equation we wrote looks like this: $\frac{1}{4}$ (*write fraction*). This is how we write a number when the number is *less than* one whole, called a fraction.



The top digit is called a **numerator** *(label)*. The numerator tells us the number of pieces out of the whole - meaning the number of pieces I'm giving away, what I'm taking *out* of the whole. Just like when we described ONE fourth, this is showing that we have ONE piece.

The bottom digit is called a **denominator** (*label)*. That's the *total number of pieces in the whole*. Just like we called each piece yesterday fourths, this 4 shows us how many pieces are in each whole.

And when we read this fraction, we read it as one fourth (point to numerator and denominator as you read it). Let's practice reading it together…one fourth!

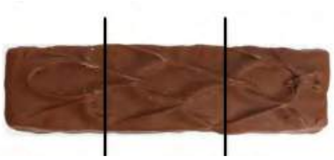
Let's go back to our Snickers. It's split into four equal pieces and if we're sharing it between four people, each person would get $\frac{1}{4}$ of a Snickers bar!

So, let's label each piece with a fraction. This is one fourth (write as fraction), this is one fourth (write as fraction), this is one fourth (write as fraction), and this is one fourth (write as fraction).

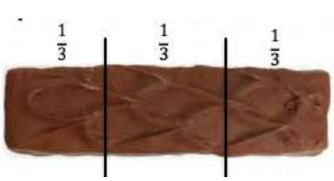
Let's Think (Slide 6): We're going to do a similar problem, but this time we're partitioning a whole into **thirds**! Thirds sounds like thrrr…three! Thirds means that there are three pieces in 1 whole. In Lesson 1, we learned a way to split our pieces to make sure they are equally divided. **How did we do that?** Possible Student Answers, Key Points:

- We start by splitting our whole into half, then we take each half and split it again.
- When we make fourths or eighths, we start with halves. Then, we split our halves into half to make fourths. If we want to make eighths, we'll split each fourth into a half.

We use that strategy when we work with *some* even number of pieces. Today, we're going to look at creating **thirds**, which is an odd number of pieces.



Let's look at this Snickers bar. If I wanted to share this between me and two friends, I would break it into three equal pieces. This is a little bit harder, so you'll need to estimate the size and do your best to make sure the sizes are equal. It's okay if it's not perfect - but you need to know that they *should* be equal pieces even if you're not drawing it perfectly.

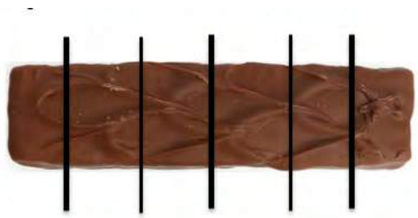


Ok, we've broken the Snickers bar into thirds. So, how many pieces would my friends and I get? We would each get one piece out of the three total pieces, right? So, we would each get $\frac{1}{3}$ of the Snickers bar! This is ⅓, this is ⅓ and this is ⅓ (*Label as you narrate).*

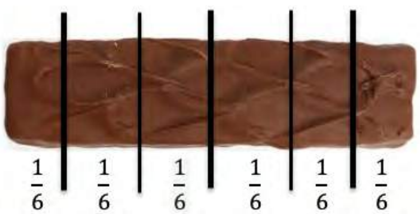
Now, let's review. What is the top digit in our fraction called? Numerator! What does it represent? The number of pieces out of the whole! What's the bottom digit in our fraction called? Denominator! What does it represent? The total number of pieces in the whole!

Let's Think (Slide 7): On this slide, we're making *six* equal pieces. Here is where we can use our strategy from Lesson 1! How are 3 and 6 related? Possible Student Answers, Key Points:

- *2 groups of 3 make 6* ***or*** *3 groups of 2 make 6*
- *2 x 3 = 6* ***or*** *3 x 2 = 6*



Exactly! So, we can start with **thirds**. You do it this time. (*Have students do this either on their whiteboard or on the slide itself)* Now, to make this into **sixths**, we take each **third** and split it in half.



Okay, we've broken the bar into sixths. How many pieces would my 5 friends and I get? We would each get one piece out of the six total pieces, right? Can you label each of the sixths as $\frac{1}{6}$ like I did for the fourths and the thirds? This is $\frac{1}{6}$, this is $\frac{1}{6}$…etc. So, we would each get $\frac{1}{6}$ of the Snickers bar!

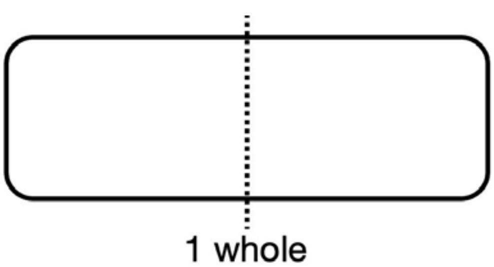
Now, remind me again. What is the top digit in our fraction called? Numerator! What does it represent? The number of pieces we're using or taking out of the whole! What's the bottom digit in our fraction called? Denominator! What does it represent? The total number of pieces in the whole!

Let's Try it (Slides 8-9): So, today, as we practice, remember that we are writing our fractions in number form. The top digit, the numerator, in our fraction always stands for the number of pieces we're taking out of the whole and the bottom digit, the denominator, is the *total* number of pieces in my whole.

WARM WELCOME

Let's Review: We name fractions based on how many pieces there are in 1 whole.

A



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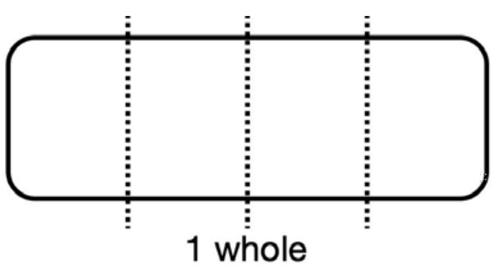

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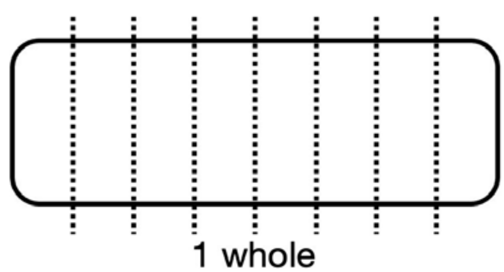

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Today we will explore partitioning a whole into equal parts and naming unit fractions with fractional notation.

Let's Talk:

How are fractions related to division?

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Let's Think:

How would I represent the pieces below as a division equation?

________ ÷ ________ = ________

total amount		# in a group/ # of groups		# of groups/ # in a group

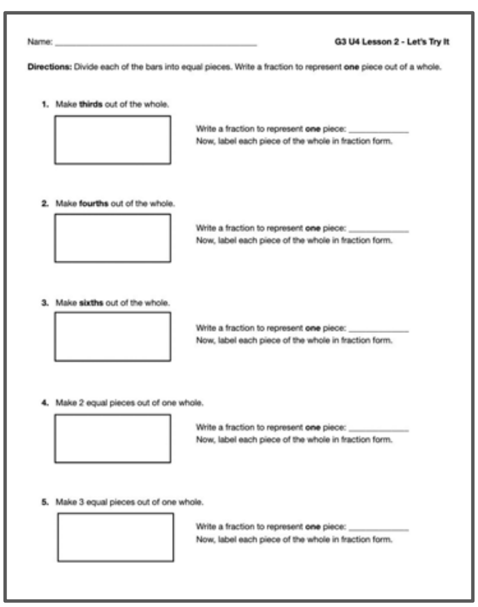
Let's Think:

Split this bar into THIRDS.

Let's Think:

Split this bar into SIXTHS.

Let's Try It:



Name: ______________________________ **G3 U4 Lesson 2 - Let's Try It**

Directions: Divide each of the bars into equal pieces. Write a fraction to represent **one** piece out of a whole.

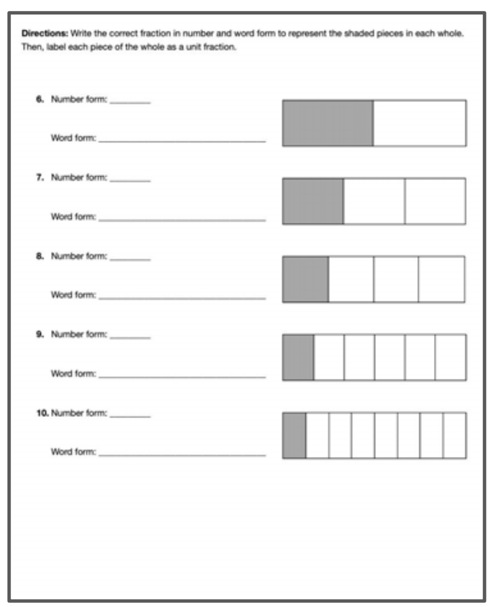
1. Make **thirds** out of the whole.
   Write a fraction to represent **one** piece: __________
   Now, label each piece of the whole in fraction form.

2. Make **fourths** out of the whole.
   Write a fraction to represent **one** piece: __________
   Now, label each piece of the whole in fraction form.

3. Make **sixths** out of the whole.
   Write a fraction to represent **one** piece: __________
   Now, label each piece of the whole in fraction form.

4. Make 2 equal pieces out of one whole.
   Write a fraction to represent **one** piece: __________
   Now, label each piece of the whole in fraction form.

5. Make 3 equal pieces out of one whole.
   Write a fraction to represent **one** piece: __________
   Now, label each piece of the whole in fraction form.



Directions: Write the correct fraction in number and word form to represent the shaded pieces in each whole. Then, label each piece of the whole as a unit fraction.

6. Number form: ________
   Word form: ______________________________

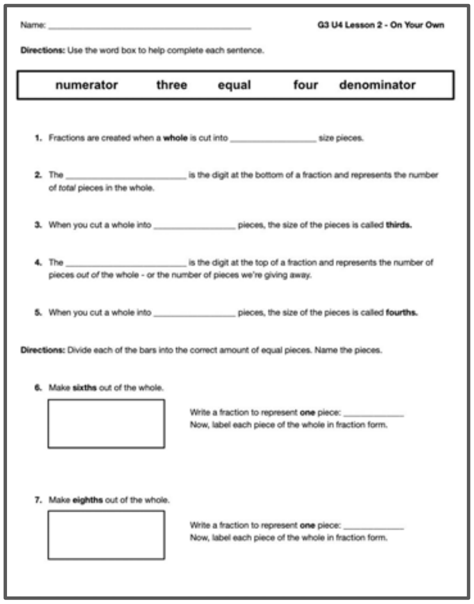
7. Number form: ________
   Word form: ______________________________

8. Number form: ________
   Word form: ______________________________

9. Number form: ________
   Word form: ______________________________

10. Number form: ________
    Word form: ______________________________

On your Own:



Name: ______________________ **G3 U4 Lesson 2 - On Your Own**

Directions: Use the word box to help complete each sentence.

numerator	**three**	**equal**	**four**	**denominator**

1. Fractions are created when a **whole** is cut into ____________ size pieces.
2. The ________________ is the digit at the bottom of a fraction and represents the number of *total* pieces in the whole.
3. When you cut a whole into ____________ pieces, the size of the pieces is called **thirds.**
4. The ________________ is the digit at the top of a fraction and represents the number of pieces *out of* the whole - or the number of pieces we're giving away.
5. When you cut a whole into ____________ pieces, the size of the pieces is called **fourths.**

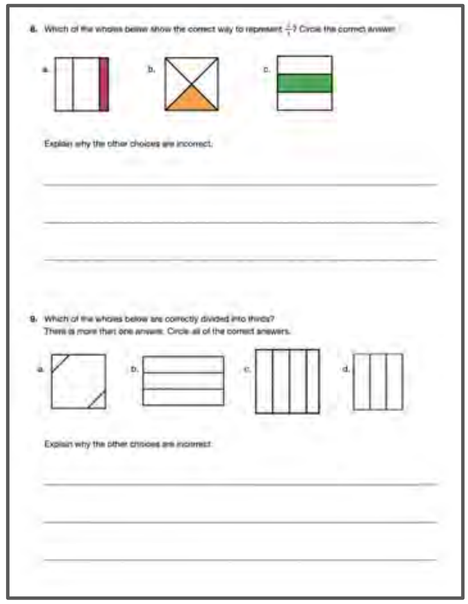
Directions: Divide each of the bars into the correct amount of equal pieces. Name the pieces.

6. Make **sixths** out of the whole.

   Write a fraction to represent **one** piece: ________
   Now, label each piece of the whole in fraction form.

7. Make **eighths** out of the whole.

   Write a fraction to represent **one** piece: ________
   Now, label each piece of the whole in fraction form.



8. Which of the wholes below show the correct way to represent $\frac{1}{4}$? Circle the correct answer.

   a. b. c.

   Explain why the other choices are incorrect.

   ____
   ____
   ____

9. Which of the wholes below are correctly divided into thirds?
   There is more than one answer. Circle all of the correct answers.

   a. b. c. d.

   Explain why the other choices are incorrect.

   ____
   ____
   ____

Name: ____

G3 U4 Lesson 2 - Let's Try It

Directions: Divide each of the bars into equal pieces. Write a fraction to represent **one** piece out of a whole.

1. Make **thirds** out of the whole.

Write a fraction to represent **one** piece: _____________
Now, label each piece of the whole in fraction form.

2. Make **fourths** out of the whole.

Write a fraction to represent **one** piece: _____________
Now, label each piece of the whole in fraction form.

3. Make **sixths** out of the whole.

Write a fraction to represent **one** piece: _____________
Now, label each piece of the whole in fraction form.

4. Make 2 equal pieces out of one whole.

Write a fraction to represent **one** piece: _____________
Now, label each piece of the whole in fraction form.

5. Make 3 equal pieces out of one whole.

Write a fraction to represent **one** piece: _____________
Now, label each piece of the whole in fraction form.

Directions: Write the correct fraction in number and word form to represent the shaded pieces in each whole. Then, label each piece of the whole as a unit fraction.

6. Number form: ________

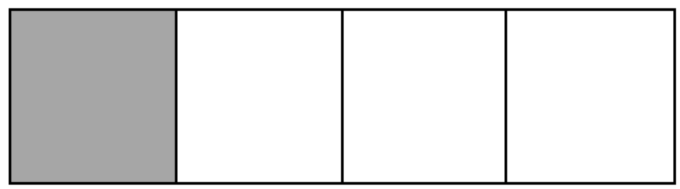
Word form: ________________________________

7. Number form: ________

Word form: ________________________________

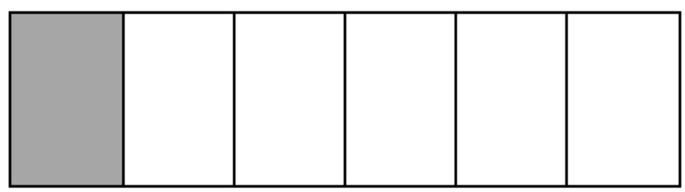
8. Number form: ________

Word form: ________________________________



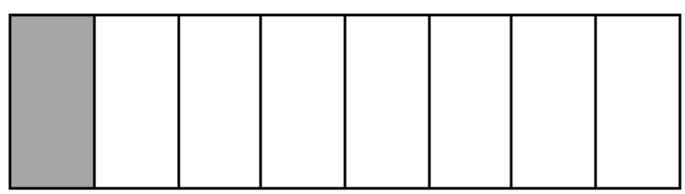
9. Number form: ________

Word form: ________________________________



10. Number form: ________

Word form: ________________________________



Name: ____ G3 U4 Lesson 2 - Independent Work

Directions: Use the word box to help complete each sentence.

numerator	**three**	**equal**	**four**	**denominator**

1. Fractions are created when a **whole** is cut into ___________________ size pieces.

2. The ___________________________ is the digit at the bottom of a fraction and represents the number of *total* pieces in the whole.

3. When you cut a whole into __________________ pieces, the size of the pieces is called **thirds.**

4. The ___________________________ is the digit at the top of a fraction and represents the number of pieces *out of* the whole - or the number of pieces we're giving away.

5. When you cut a whole into __________________ pieces, the size of the pieces is called **fourths.**

Directions: Divide each of the bars into the correct amount of equal pieces. Name the pieces.

6. Make **sixths** out of the whole.

Write a fraction to represent **one** piece: _____________
Now, label each piece of the whole in fraction form.

7. Make **eighths** out of the whole.

Write a fraction to represent **one** piece: _____________
Now, label each piece of the whole in fraction form.

8. Which of the wholes below show the correct way to represent $\frac{1}{3}$? Circle the correct answer.

a. b. c.

Explain why the other choices are incorrect.

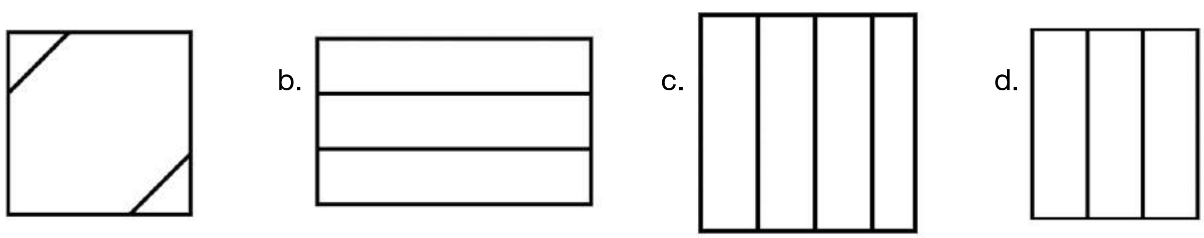
____

____

____

9. Which of the wholes below are correctly divided into thirds?
There is more than one answer. Circle all of the correct answers.

a. b. c. d.



Explain why the other choices are incorrect.

____

____

____

Name: ANSWER KEY

Directions: Divide each of the bars into equal pieces. Write a fraction to represent **one** piece out of a whole.

1. Make **thirds** out of the whole.

$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$

Write a fraction to represent **one** piece: $\frac{1}{3}$
Now, label each piece of the whole in fraction form.

2. Make **fourths** out of the whole.

$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$

Write a fraction to represent **one** piece: $\frac{1}{4}$
Now, label each piece of the whole in fraction form.

3. Make **sixths** out of the whole.

$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

Write a fraction to represent **one** piece: $\frac{1}{6}$
Now, label each piece of the whole in fraction form.

4. Make 2 equal pieces out of one whole.

$\frac{1}{2}$	$\frac{1}{2}$

Write a fraction to represent **one** piece: $\frac{1}{2}$
Now, label each piece of the whole in fraction form.

5. Make 3 equal pieces out of one whole.

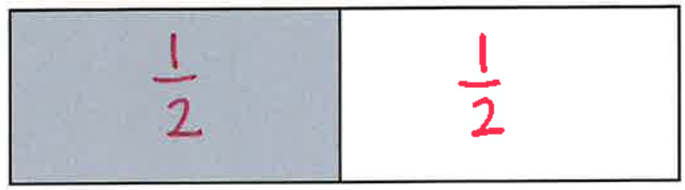
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$

Write a fraction to represent **one** piece: $\frac{1}{3}$
Now, label each piece of the whole in fraction form.

Directions: Write the correct fraction in number and word form to represent the shaded pieces in each whole. Then, label each piece of the whole as a unit fraction.

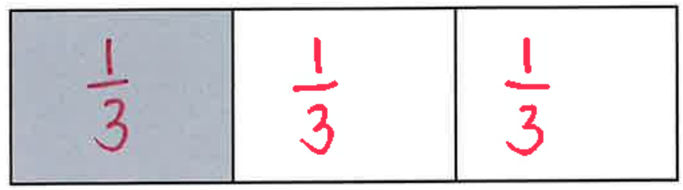
6. Number form: $\frac{1}{2}$

Word form: one-half



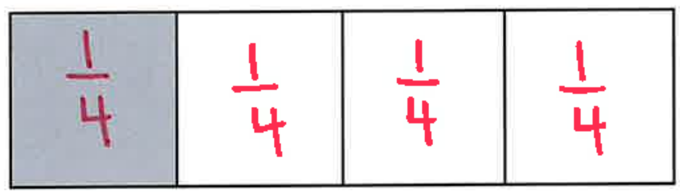
7. Number form: $\frac{1}{3}$

Word form: one-third



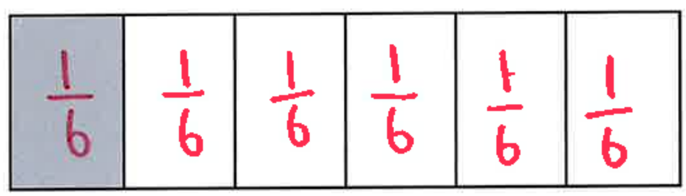
8. Number form: $\frac{1}{4}$

Word form: one-fourth



9. Number form: $\frac{1}{6}$

Word form: one-sixth



10. Number form: $\frac{1}{8}$

Word form: one-eighth

Name: ANSWER KEY

G3 U4 Lesson 2 - Independent Practice

Directions: Use the word box to help complete each sentence.

numerator	**three**	**equal**	**four**	**denominator**

1. Fractions are created when a **whole** is cut into equal size pieces.

2. The denominator is the digit at the bottom of a fraction and represents the number of *total* pieces in the whole.

3. When you cut a whole into three pieces, the size of the pieces is called **thirds.**

4. The numerator is the digit at the top of a fraction and represents the number of pieces *out of* the whole - or the number of pieces we're giving away.

5. When you cut a whole into four pieces, the size of the pieces is called **fourths.**

Directions: Divide each of the bars into the correct amount of equal pieces. Name the pieces.

6. Make **sixths** out of the whole.

$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

Write a fraction to represent **one** piece: $\frac{1}{6}$

Now, label each piece of the whole in fraction form.

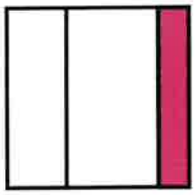
7. Make **eighths** out of the whole.

$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$

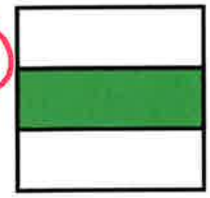
Write a fraction to represent **one** piece: $\frac{1}{8}$

Now, label each piece of the whole in fraction form.

8. Which of the wholes below show the correct way to represent $\frac{1}{3}$? Circle the correct answer.

a. 

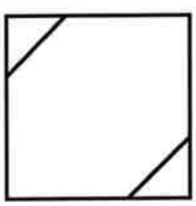
b. 

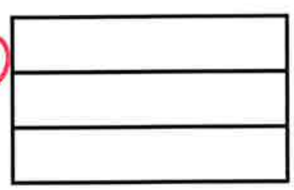
c. 

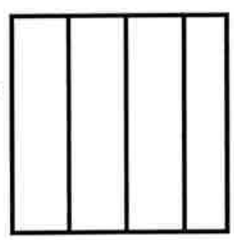
Explain why the other choices are incorrect.

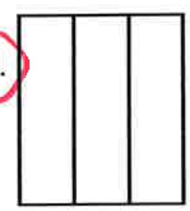
The other choices are wrong because a is not cut into equal pieces and b is cut into equal pieces, but into fourths, not thirds.

9. Which of the wholes below are correctly divided into thirds?
There is more than one answer. Circle all of the correct answers.

a. 

b. 

c. 

d. 

Explain why the other choices are incorrect.

a is wrong because it's not cut into equal pieces. c is wrong because it's also not cut into equal pieces and it's cut into four unequal pieces.

G3 U4 Lesson 3

Partition a whole into equal parts and name unit fractions on a number line

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G3 U4 Lesson 3 - Partition a whole into equal parts and name unit fractions on a number line

Warm Welcome (Slide 1): Tutor choice.

Let's Review (Slide 2): Yesterday we learned that we can use numbers, or fractional notation, to describe pieces of 1 whole. We learned that the top digit, the numerator, in our fraction always stands for the number of pieces we're taking out of the whole and the bottom digit, the denominator, is the *total* number of pieces in my whole. Let's quickly write some fractions to describe the shaded part of these images.

- Look at A - Let's start with the denominator, the bottom digit. Count how many pieces are in 1 whole…2! That's the denominator (write it). And now let's count how many pieces are shaded in…1! So, this shaded part shows ½, or 1 out of 2 pieces.
- Look at B - Write the fraction that this shaded part shows on your white board or paper.
- Look at C - Write the fraction that this shaded part shows on your white board or paper.

Frame the Learning/Connect to Prior Learning (Slide 3): Today we will continue partitioning, or *dividing*, a whole into **equal parts**. When we partition a whole into **equal** pieces, we create a **fraction** of the whole. In the last lesson, we wrote fractions in number form. We can split our wholes into halves, thirds, fourths, sixths, and eighths! Today, we're going to use those same skills and identify fractions on a number line!

Let's Talk (Slide 4): Before we start, look at these pictures. This is a football field. This is a speedometer that we find on the dashboard of a car. Here's a measuring cup, a clock, a scale we'd find at the grocery store, and here's a thermometer that tells us the temperature outside! They're all such different objects, **but what do they all have in common?** Possible Student Answers, Key Points:

- They all have numbers on them, some even have fractions!
- They all use numbers to tell us something (a clock to tell time, a speedometer tells us how fast we're going, a scale tells us how heavy our food is, etc.)

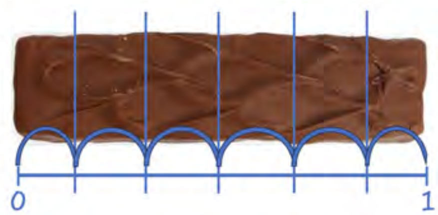
They all have numbers on them! They also all have NUMBER LINES. Number lines are a part of our daily lives!

Let's Think (Slide 4): Now, let's explore how we can use what we know about fractions to show fractions on a number line. This says to cut this Snickers bar into six equal pieces with your pencil. Let's do that.

You may not realize it, but we've already started making a number line! Now, watch as I show you how to make a number line.

(*Draw a line below the Snickers bar stretching from end to end. Draw a vertical tick at both ends - label the first tick **0** and the second **1***) That's a number line. See how I've marked the beginning of my number line as **0** and the end as **1**? I'm showing that I have ONE whole of something.

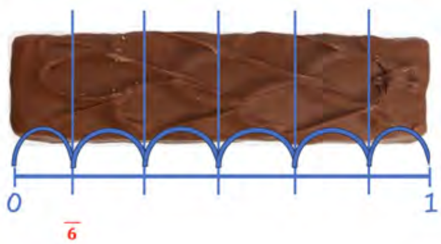
What's missing from this number line, though, is the number of pieces. That's where your cuts come in - you've already cut the whole into six pieces. All I need to do is put them on the actual number line! (*Extend each of the vertical lines onto the number line)*



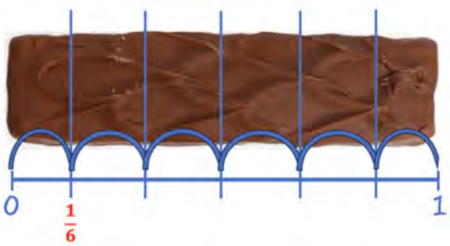
Let's check to make sure that the number line is six pieces. (*Draw "hops" across the top of each tick, counting aloud).*

Now that I've finished drawing my number line I need to label it! Remind me again, **what's a numerator and what's a denominator?** I need to know **both** of these terms if I want to write my fractions correctly! Possible Student Answers, Key Points:

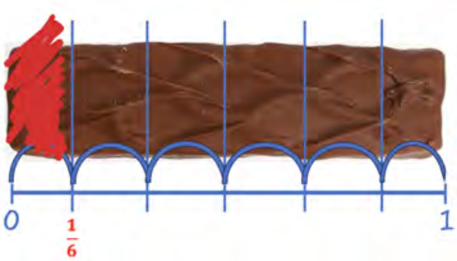
- The numerator tells us the number of pieces we're taking out of the whole.
- The denominator tells us the total number of pieces in the whole.



If the denominator tells us the **total** number of pieces in the whole, what would be the denominator for this number line? Six! (*Label the first tick after the zero with* $\frac{}{6}$ *and leave the numerator empty)* That's right! That's the number of pieces we counted over the whole number line.



The numerator is the number of pieces we're using *out of the whole*, so what would the numerator be for this first piece of Snickers we cut? One!



Note: If students are having a hard time understanding the question, shade in the first piece of the Snickers bar and ask them how many pieces are shaded? When they say "one," label the numerator as 1) If from **0** to the first tick is one piece of the Snickers bar, then my tick dash is $\frac{1}{6}$ to show that I'm representing just **one** piece.

Let's Think (Slide 5): Let's try this one together. This time we have a whole Snickers bar and the number line is already broken into pieces. Look at the number line.

How many pieces should the Snickers bar be cut into? I need to count the pieces on my number line to find out! How did I count my pieces on the number line in the last example? (*If students need the reminder, show them how to make the first "hop" in the same way as the example in Slide 4, then have them complete the hops themselves)*

How many pieces is our Snickers bar? *Four!* If my Snickers bar is cut into four pieces, what fractional unit am I using? *Fourths!*

So, I'm going to label my first tick $\frac{1}{4}$. Why does that make sense? Possible Student Answers, Key Points:

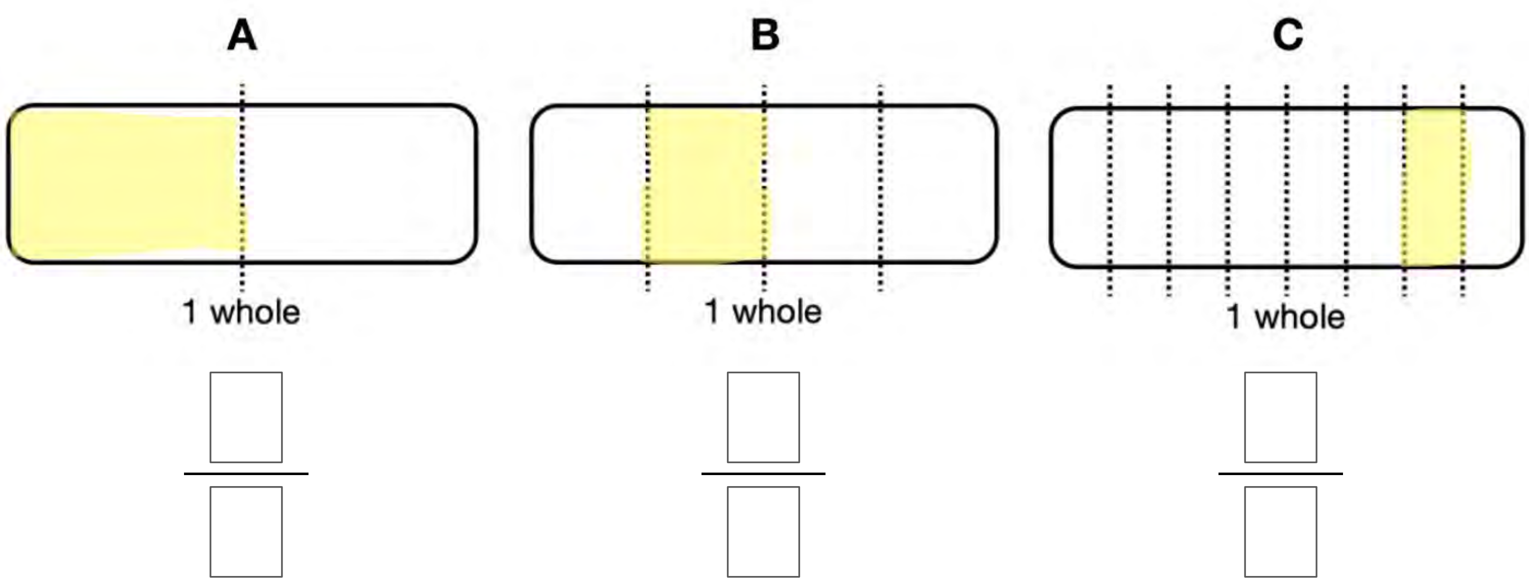
- The first tick represents **one** piece of the Snickers bar, so the numerator is 1.
- The denominator tells us the total number of pieces in the whole and there are four pieces of Snickers, so the denominator is 4.

That's right! We counted four pieces across our number line, so that tells us our denominator is four. But we're only focusing on the FIRST piece of the Snickers bar, so that means our numerator is 1. If we plugged those numbers into our fraction, we would have ¼!

Let's Try it (Slides 6): So, today, as we practice, remember that a number line is just like a bar model - they must be represented in equal sized pieces and the hops between 0 and 1 tell us the number of pieces your whole is broken into. Each time you make a number line, check you have the right number of pieces by counting your hops!

WARM WELCOME

Let's Review: We use fractional notation to describe pieces of a whole.



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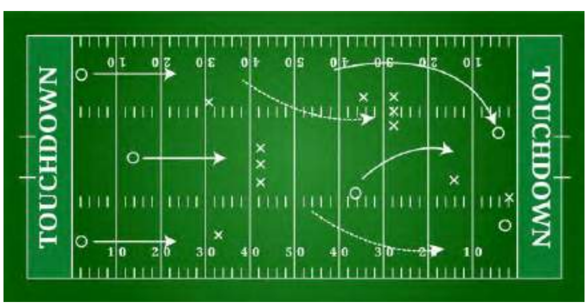
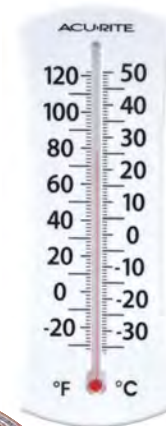
Today we will explore partitioning a whole into equal parts and naming unit fractions on a number line.

Let's Talk:

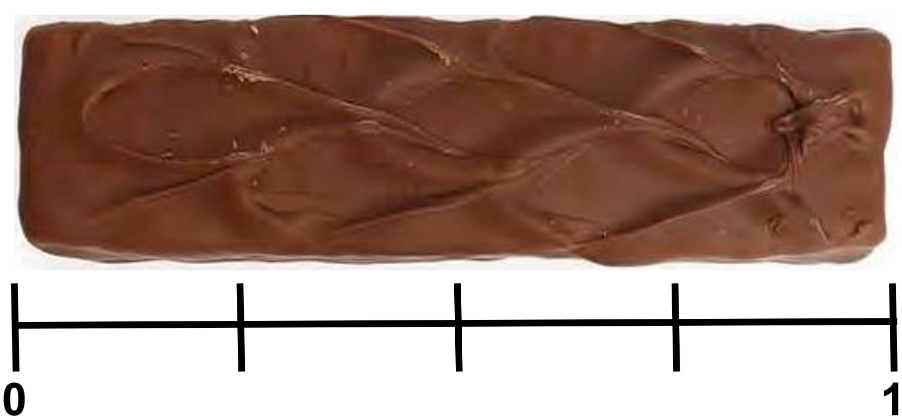




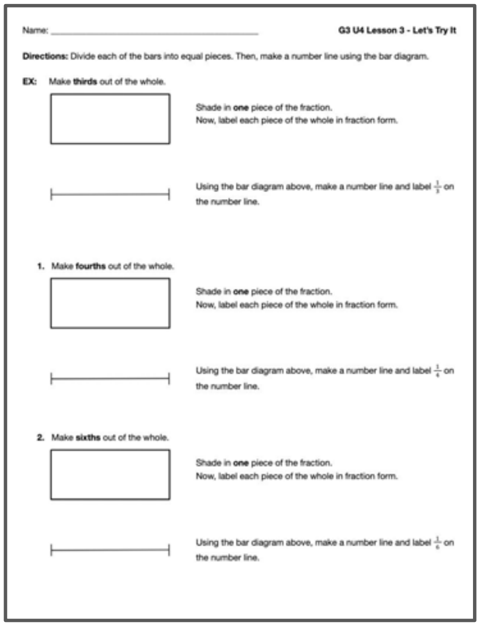
Let's Think:

Split this bar into SIXTHS.

Let's Think:



Let's Try It:


Name: ______________________________ G3 U4 Lesson 3 - Let's Try It

Directions: Divide each of the bars into equal pieces. Then, make a number line using the bar diagram.

EX: Make **thirds** out of the whole.

Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Using the bar diagram above, make a number line and label $\frac{1}{3}$ on the number line.

1. Make **fourths** out of the whole.

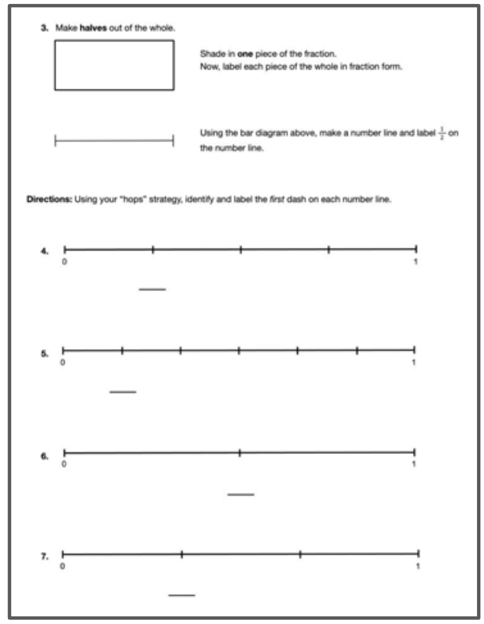
Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Using the bar diagram above, make a number line and label $\frac{1}{4}$ on the number line.

2. Make **sixths** out of the whole.

Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Using the bar diagram above, make a number line and label $\frac{1}{6}$ on the number line.


3. Make **halves** out of the whole.

Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Using the bar diagram above, make a number line and label $\frac{1}{2}$ on the number line.

Directions: Using your "hops" strategy, identify and label the *first* dash on each number line.

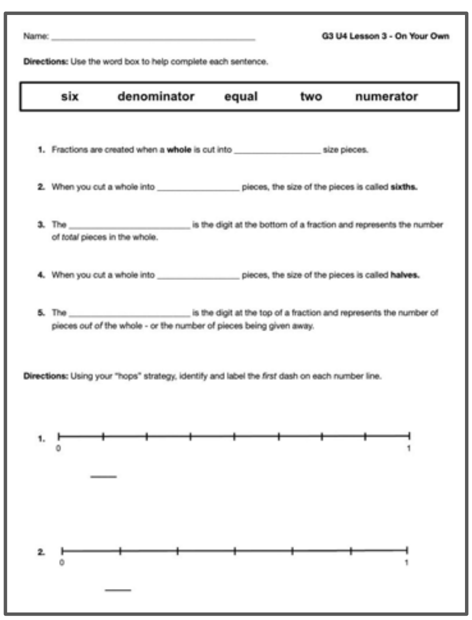
4. 0 1

5. 0 1

6. 0 1

7. 0 1

On your Own:


Name: ______________________________ G3 U4 Lesson 3 - On Your Own

Directions: Use the word box to help complete each sentence.

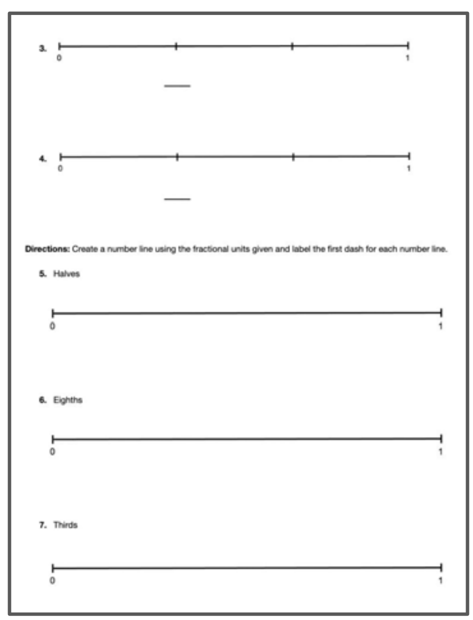
six	denominator	equal	two	numerator

1. Fractions are created when a **whole** is cut into ______________ size pieces.
2. When you cut a whole into ______________ pieces, the size of the pieces is called **sixths.**
3. The ______________________ is the digit at the bottom of a fraction and represents the number of *total* pieces in the whole.
4. When you cut a whole into ______________ pieces, the size of the pieces is called **halves.**
5. The ______________________ is the digit at the top of a fraction and represents the number of pieces *out of* the whole - or the number of pieces being given away.

Directions: Using your "hops" strategy, identify and label the *first* dash on each number line.

1. 0 1

2. 0 1


3. 0 1

4. 0 1

Directions: Create a number line using the fractional units given and label the first dash for each number line.

5. Halves

0 1

6. Eighths

0 1

7. Thirds

0 1

Name: ______________________________ **G3 U4 Lesson 3 - Let's Try It**

Directions: Divide each of the bars into equal pieces. Then, make a number line using the bar model.

EX: Make **thirds** out of the whole.

Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Using the bar model above, make a number line and label $\frac{1}{3}$ on the number line.

1. Make **fourths** out of the whole.

Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Using the bar model above, make a number line and label $\frac{1}{4}$ on the number line.

2. Make **sixths** out of the whole.

Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Using the bar model above, make a number line and label $\frac{1}{6}$ on the number line.

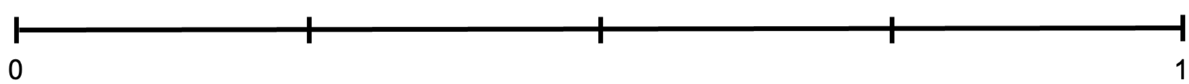
3. Make **halves** out of the whole.

Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Using the bar model above, make a number line and label $\frac{1}{2}$ on the number line.

Directions: Using your “hops” strategy, identify and label the *first* dash on each number line.

4.



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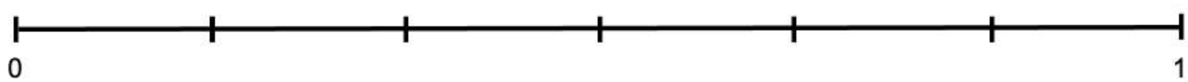

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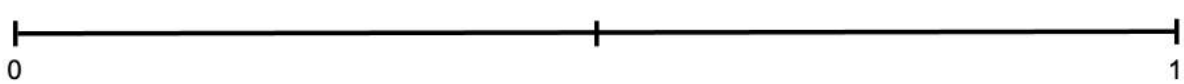

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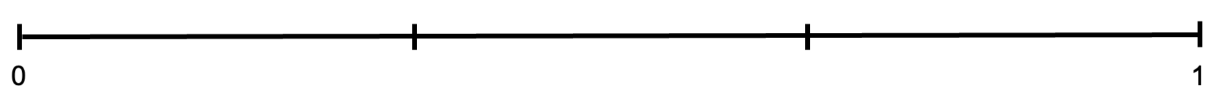


Name: ____ **G3 U4 Lesson 3 - Independent Work**

Directions: Use the word box to help complete each sentence.

six	**denominator**	**equal**	**two**	**numerator**

1. Fractions are created when a **whole** is cut into ___________________ size pieces.

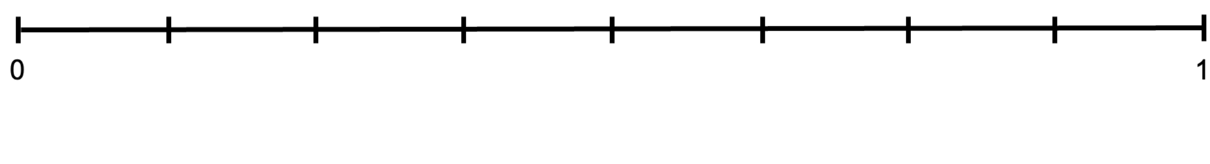
2. When you cut a whole into __________________ pieces, the size of the pieces is called **sixths.**

3. The ___________________________ is the digit at the bottom of a fraction and represents the number of *total* pieces in the whole.

4. When you cut a whole into __________________ pieces, the size of the pieces is called **halves.**

5. The ___________________________ is the digit at the top of a fraction and represents the number of pieces *out of* the whole - or the number of pieces being given away.

Directions: Using your “hops” strategy, identify and label the *first* dash on each number line.

1.


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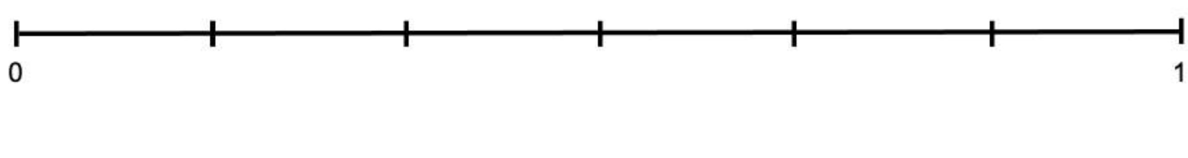

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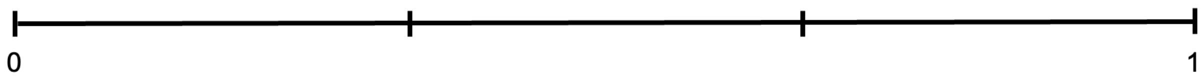

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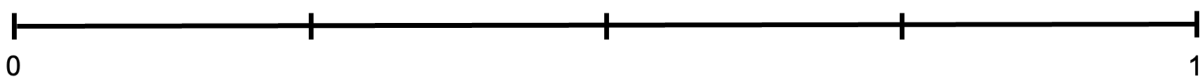
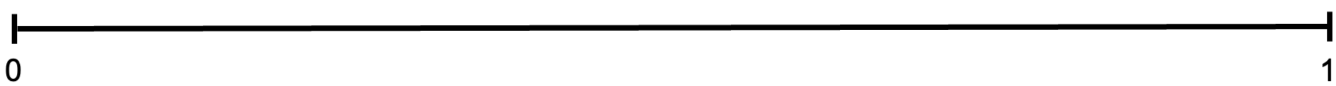
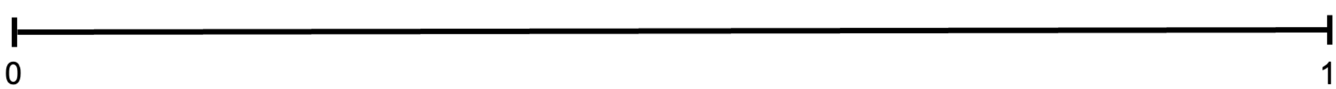


Directions: Create a number line using the fractional units given and label the first dash for each number line.

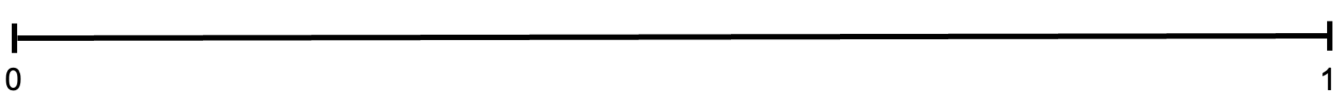
5. Halves



6. Eighths



7. Thirds

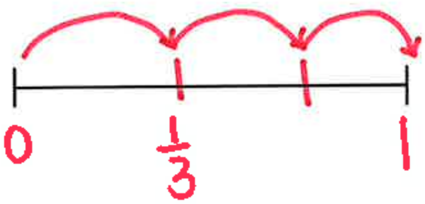


Name: ANSWER KEY

Directions: Divide each of the bars into equal pieces. Then, make a number line using the bar model.

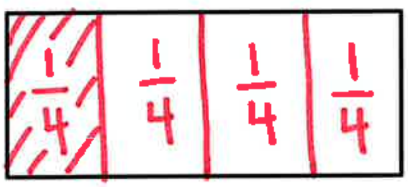
EX: Make **thirds** out of the whole.

Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

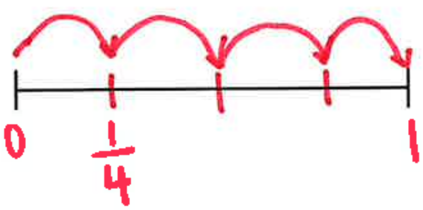


Using the bar model above, make a number line and label $\frac{1}{3}$ on the number line.

1. Make **fourths** out of the whole.

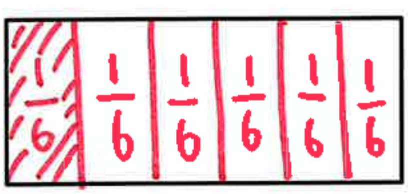


Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

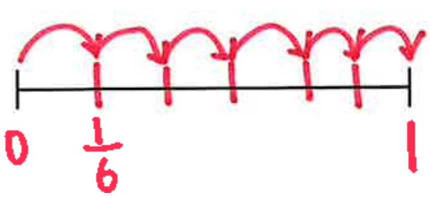


Using the bar model above, make a number line and label $\frac{1}{4}$ on the number line.

2. Make **sixths** out of the whole.



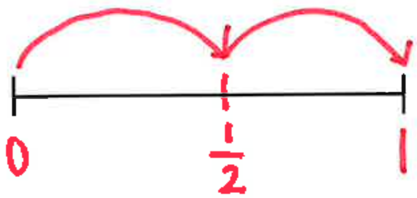
Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.



Using the bar model above, make a number line and label $\frac{1}{6}$ on the number line.

3. Make **halves** out of the whole.

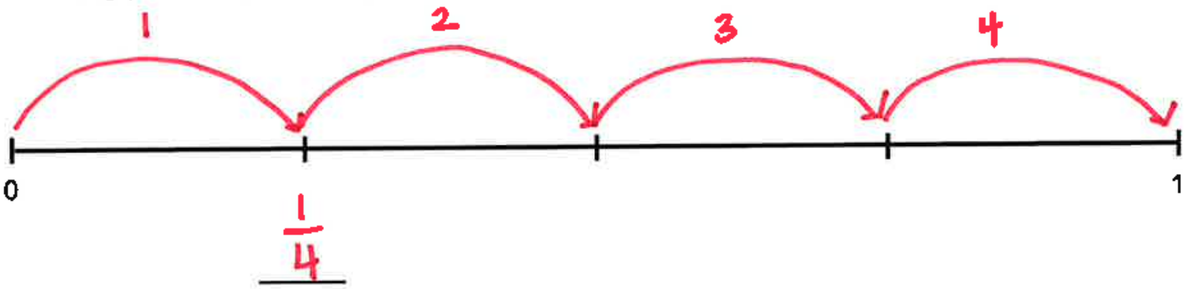
Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.



Using the bar model above, make a number line and label $\frac{1}{2}$ on the number line.

Directions: Using your "hops" strategy, identify and label the *first* dash on each number line.

4.



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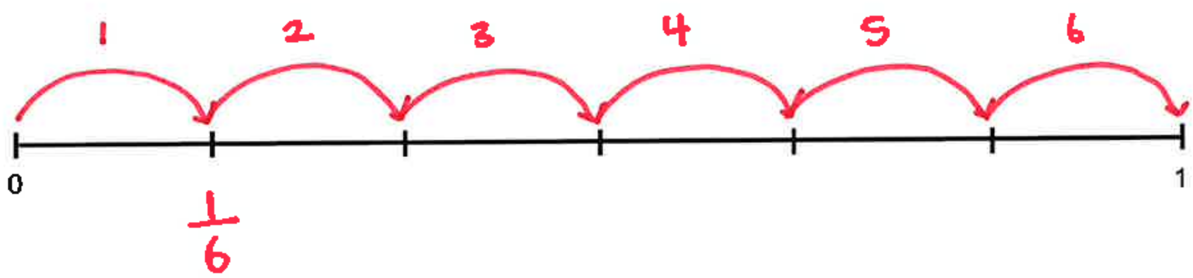

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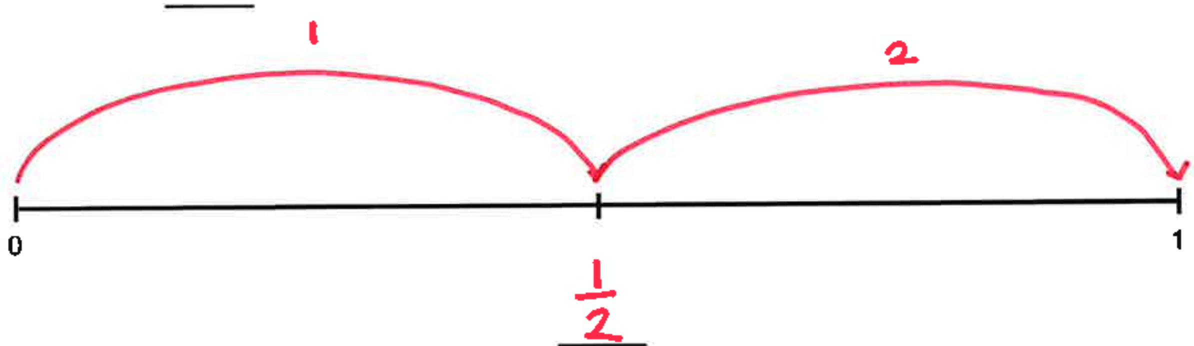

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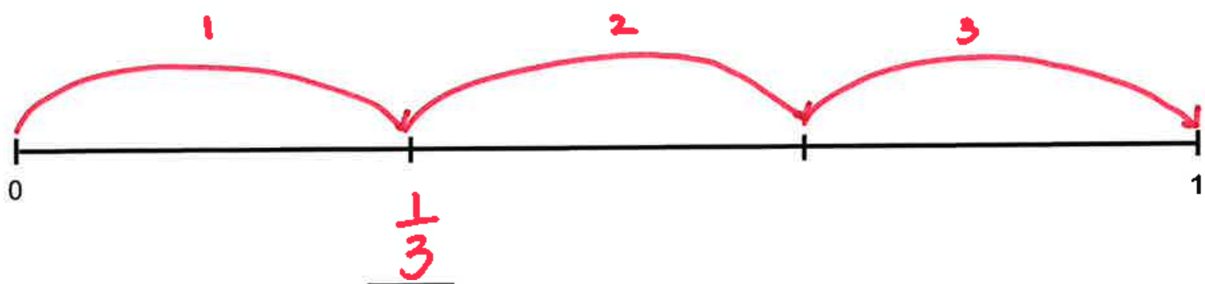


Name: ANSWER KEY

G3 U4 Lesson 3 - Independent Practice

Directions: Use the word box to help complete each sentence.

six	**denominator**	**equal**	**two**	**numerator**

1. Fractions are created when a **whole** is cut into equal size pieces.

2. When you cut a whole into six pieces, the size of the pieces is called **sixths.**

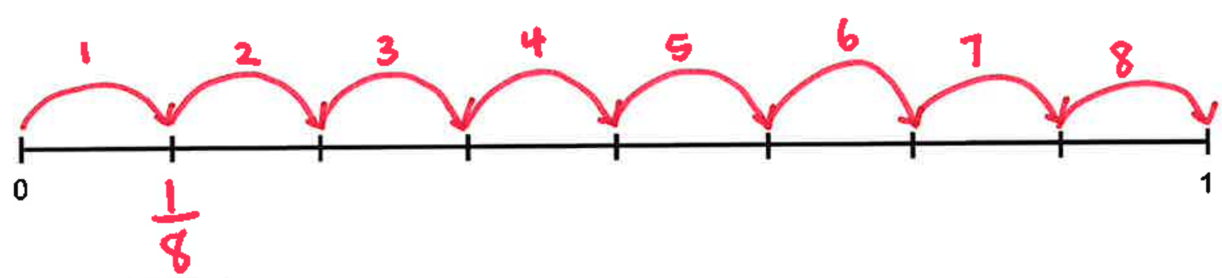
3. The denominator is the digit at the bottom of a fraction and represents the number of *total* pieces in the whole.

4. When you cut a whole into two pieces, the size of the pieces is called **halves.**

5. The numerator is the digit at the top of a fraction and represents the number of pieces *out of* the whole - or the number of pieces being given away.

Directions: Using your "hops" strategy, identify and label the *first* dash on each number line.

1.



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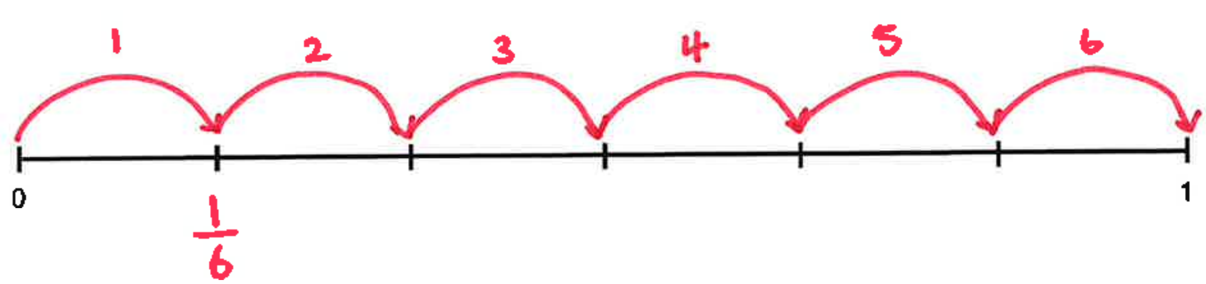
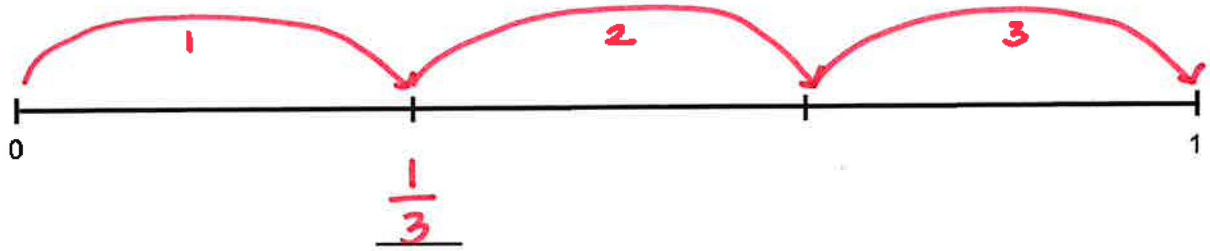
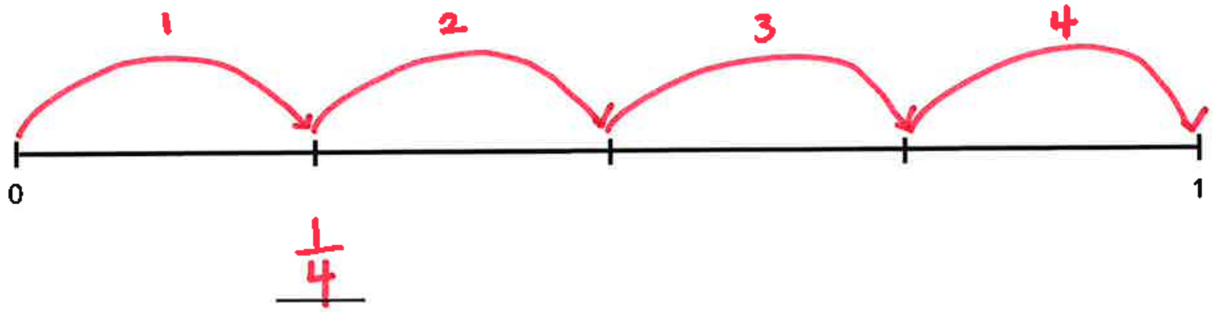
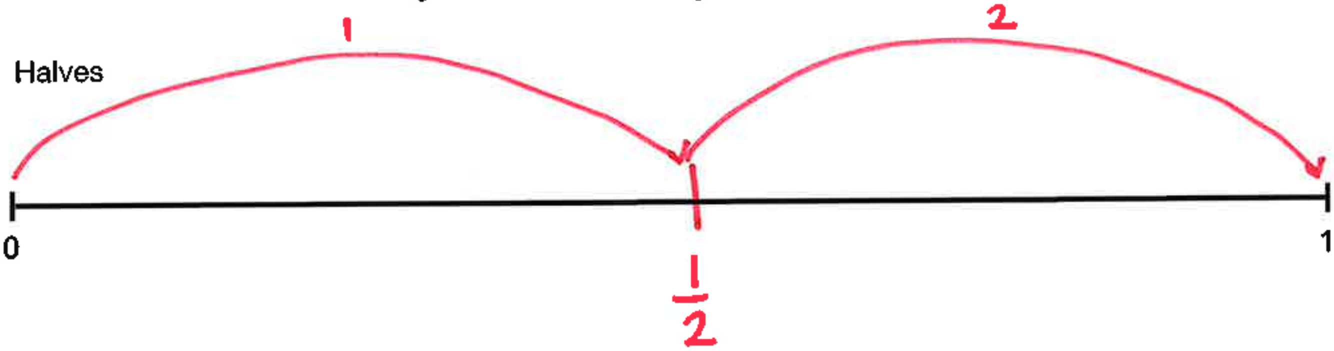


3. 

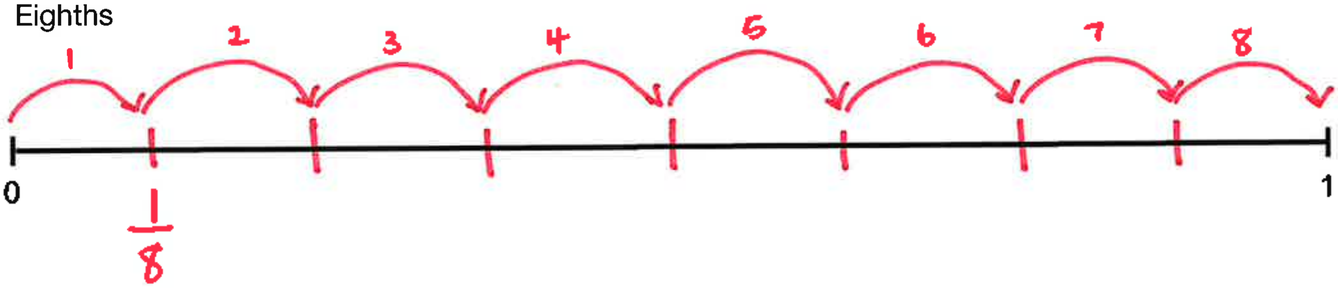
4. 

Directions: Create a number line using the fractional units given and label the first dash for each number line.

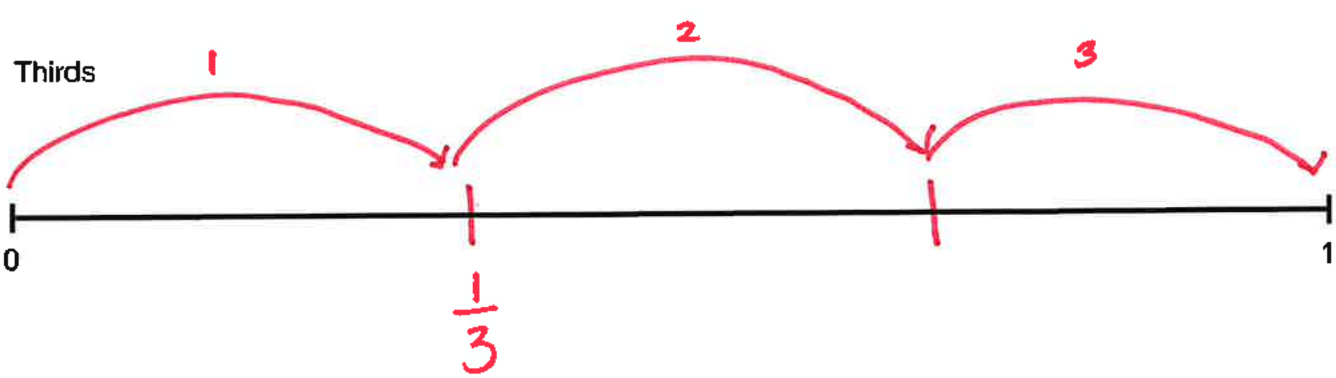
5. Halves



6. Eighths



7. Thirds



G3 U4 Lesson 4

Explore non-unit fractions less than one whole on a number line

G3 U4 Lesson 4 - Students will explore non-unit fractions less than one whole on a number line

Warm Welcome (Slide 1): Tutor choice.

Let's Review (Slide 2): Remember in the last lesson, we showed how we can create a number line by using fraction bars as a guiding tool. The same rules for fractions still apply - all pieces must be equal sizes and the numerator and denominator must be represented accurately. Let's look at these two number lines and practice writing fractions to represent the points on the number lines:

- Look at Point A - Let's write a fraction to represent Point A. Remember, we can always draw a bar above the number line to help us visualize the fractions. Let's start with how many pieces there are in 1 whole. We count the hops starting at 0 all the way to one…1, 2, 3. There are 3 pieces in 1 whole, that means that we are working with thirds and our denominator will be 3. The point is at 1. So this point shows ⅓ *(label).*
- Look at Point B - Write a fraction on your white board or paper to represent Point B on the number line.

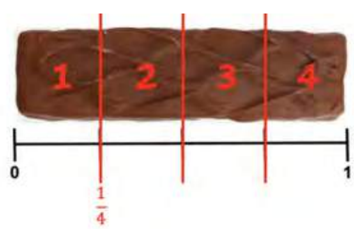
Frame the Learning/Connect to Prior Learning (Slide 3): Today we will continue our work with fractions on number lines.

Let's Talk (Slide 3): Before we start, let's remind ourselves of what we already know about reading a number line. For example, here I created a number line to help me divide my Snickers bar into four pieces to share with my friends. **How did I do?** Possible Student Answers, Key Points:

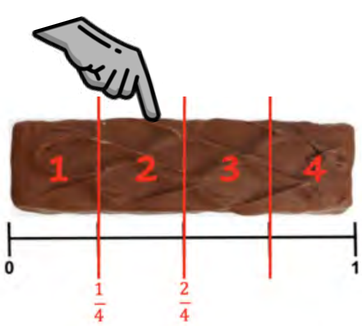
- The pieces aren't even - you can't draw a fraction with unequal pieces
- The dashes on the number line need to be equally spaced apart or else it's not a fraction - that makes the sizes of the pieces unfair for each of your friends!

Oh! You're right! Silly me. Let me fix that on the next slide.

Let's Think (Slide 4): Ok, so here the Snickers is cut into 4 EQUAL pieces, that's much better! Now, what would be the fractional notation for this first dash on our number line? ¼! So, this leads us to our lesson for today. If the first dash represents ¼ because it's one piece of the Snickers bar, what would the next dash represent?

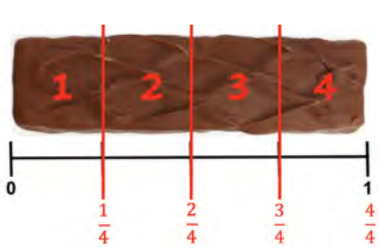


Give students a chance to answer. Well, let's cut this Snickers to help us. We are cutting it into 1, 2, 3, 4 equal-sized pieces. Now let's label each piece. This is one piece, if I have both of these that would be 2 pieces, all of these it would be 3 pieces, and 4 pieces.



So, if I have just this 1 piece, I have ¼. But, how many pieces of Snickers do I have if I stop here? *(Point to the second piece)* Two pieces!

So, think about what you know about fractions and tell me, how would we write a fraction for **2** pieces of Snickers out of **4** pieces total? There are still 4 total pieces in 1 whole, so the denominator stays the same. But now, I don't have 1 out of 4, I have 2 total pieces out of 4. So I would write this as $\frac{2}{4}$.

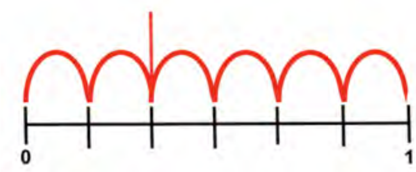


How many pieces of Snickers do I have if I stop here? (*Point to the third piece*) Three pieces! So, think about what you know about fractions and tell me, how would we write a fraction for **3** pieces of Snickers out of **4** pieces total? (*Allow students to write* $\frac{3}{4}$ *on the slide or on whiteboards.*)

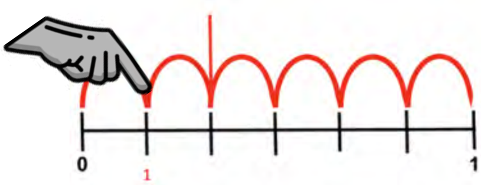
And finally, if I stop at 1 whole, what's a fraction I can write to represent 1 whole? Well, the denominator stays the same, 4 pieces. But now, I have 4 out of 4 total pieces, just like we described 1 whole as 4 fourths. So I can write $\frac{4}{4}$ to represent the 1 whole.

Let's Think (Slide 6): Let's try this work *without* our Snickers bar. You can still picture it in your head, though, if that helps! Let's take a look at this number line. **We need to figure out what fraction is represented by the dash that the arrow is pointing at. How do I do that?** Possible Student Answers, Key Points:

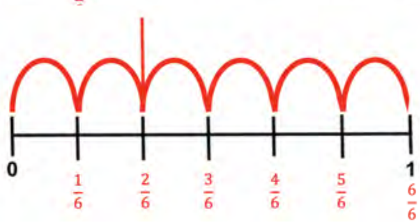
- I count the pieces my whole is divided into - I do that by hopping across the number line and counting up the total number of pieces!
- The number line is divided into 6 parts. The first tick is the first piece. That's 1 out of 6. The fraction is $\frac{1}{6}$.
- The second tick is 2 pieces out of a total of 6 pieces, so the fraction is $\frac{2}{6}$.



That's right! The first thing I need to do is figure out how many pieces are in 1 whole. I see the 0 and the 1 so this is all 1 whole (*point to the space from 0 to 1*). Let's count how many pieces are in 1 whole. Count with me (*Draw in the jumps as you count*)...1, 2, 3, 4, 5, 6! So I know that this whole is split into 6 equal pieces.



I can use that to help me label the number line. I know that the denominator tells me how many pieces there are in 1 whole and the numerator tells me how many pieces I have. This is 1 out of 6, I am going to label it as $\frac{1}{6}$.



Let's continue labeling until we have every tick labeled. This is 2 out of 6, this is 3 out of 6, etc. (*Continue counting and labeling until you have* $\frac{6}{6}$ *labeled*). Now, if I go back, I can see that this arrow is pointing to $\frac{2}{6}$!

Let's Think (Slide 7): Great job! Now let's try it with the same number line, but further down! **How would we figure out the fraction where the arrow is pointing?** Possible Student Answers, Key Points:

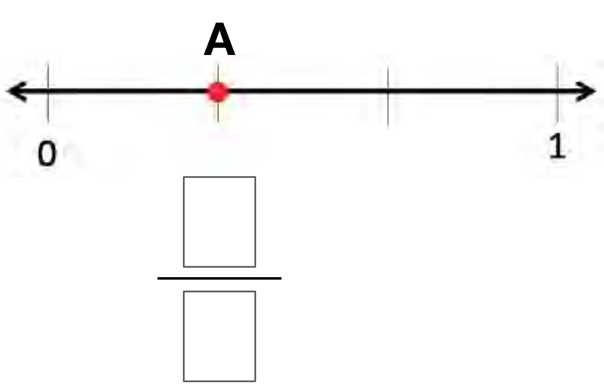
- I know my number line is divided into 6 pieces, so I just need to "hop" down to the tick with the arrow.
- The arrow stops after 4 pieces out of the total 6 pieces, so the fraction is $\frac{4}{6}$.
- This is correct because if I imagine a Snickers bar above the number line, the dash would be 4 Snickers bar pieces out of 6 Snickers bar pieces!

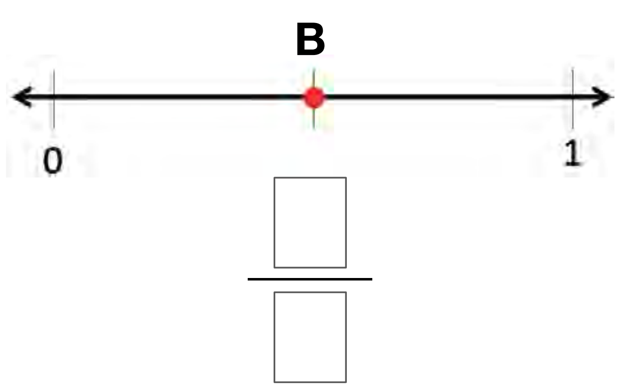
That's exactly right, this arrow is pointing to $\frac{4}{6}$ and because I showed my work and labeled the whole number line in the last slide, it was easy to read and figure that out!

Let's Try it (Slides 7): So, today as we practice, remember our steps to creating and labeling a number line. The distance between each piece of a number line must be equally sized. We can use hops to make sure we have the right number of pieces represented. And we can always draw our own Snickers bar if we need a little help picturing the number of pieces on a number line!

WARM WELCOME

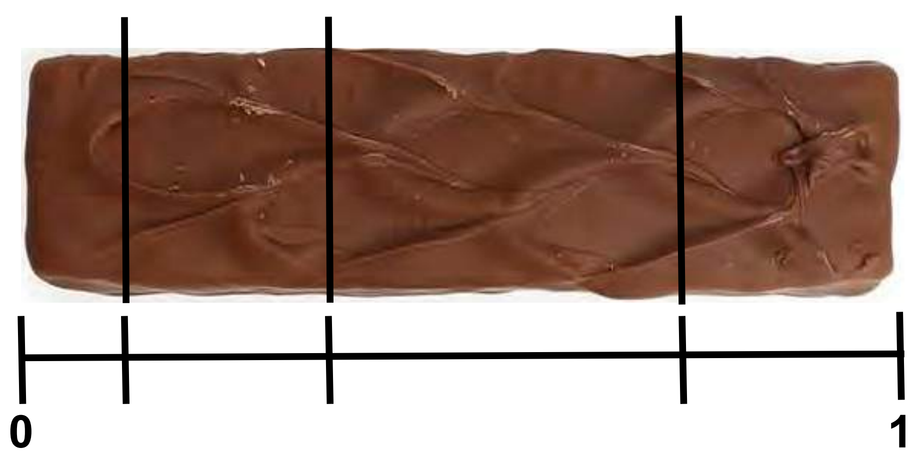
Let's Review: We can show unit fractions on a number line.





Today we will explore non-unit fractions less than one whole on a number line.

Let's Talk:



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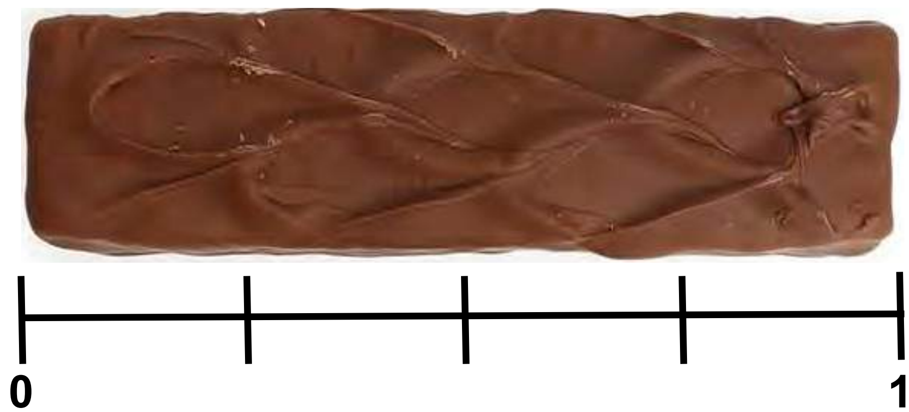
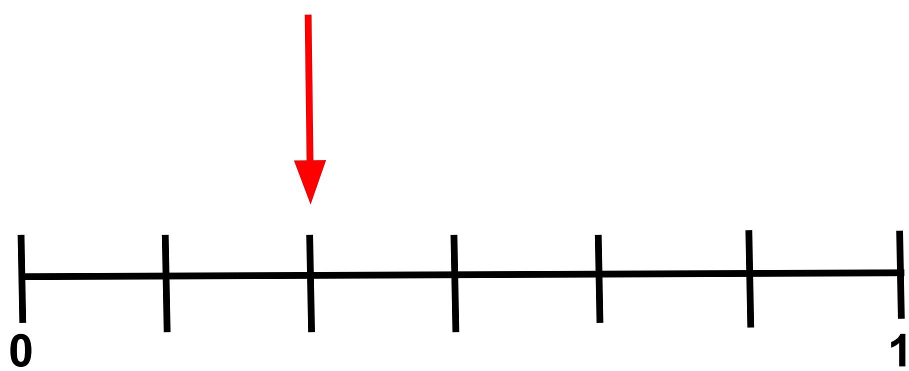
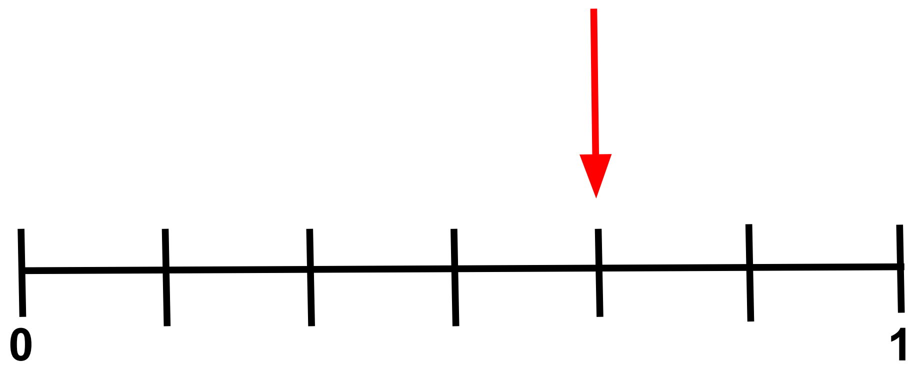
Let's Think:



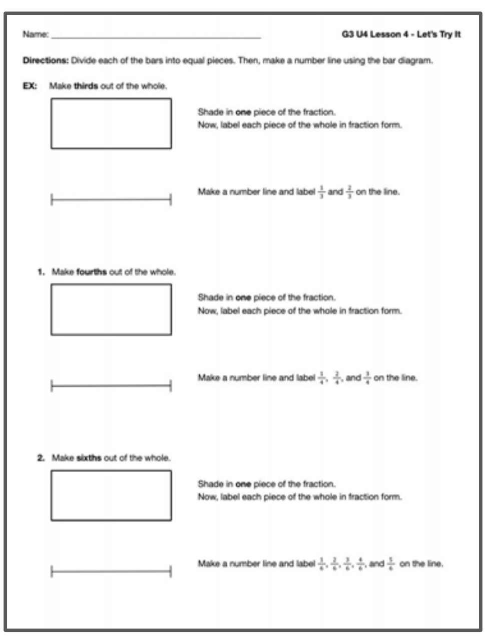
Let's Think:



Let's Think:



Let's Try It:


Name: ______________________ **G3 U4 Lesson 4 - Let's Try It**

Directions: Divide each of the bars into equal pieces. Then, make a number line using the bar diagram.

EX: Make **thirds** out of the whole.

Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Make a number line and label $\frac{1}{3}$ and $\frac{2}{3}$ on the line.

1. Make **fourths** out of the whole.

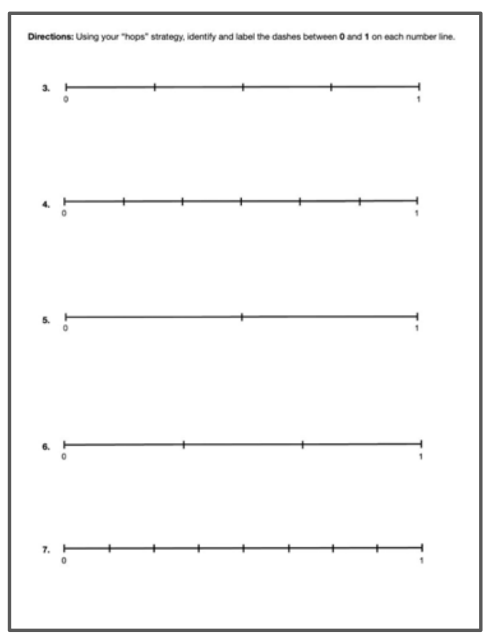
Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Make a number line and label $\frac{1}{4}$, $\frac{2}{4}$, and $\frac{3}{4}$ on the line.

2. Make **sixths** out of the whole.

Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Make a number line and label $\frac{1}{6}$, $\frac{2}{6}$, $\frac{3}{6}$, $\frac{4}{6}$, and $\frac{5}{6}$ on the line.


Directions: Using your "hops" strategy, identify and label the dashes between **0** and **1** on each number line.

3. 0 1

4. 0 1

5. 0 1

6. 0 1

7. 0 1

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On your Own:

Name: ___________________________________ **G3 U4 Lesson 4 - On Your Own**

Directions: Use the word box to help complete each sentence.

numerator	**two-sixths**	**denominator**	**equally**	**three-fourths**

1. The dashes on a number line with fractions must be _________________ spaced apart.
2. The _______________________ is the digit at the top of a fraction and represents **the number of pieces out of the whole** - or the number of pieces being given away.
3. The _______________________ is the digit at the bottom of a fraction and represents the number of **total pieces in the whole.**
4. The fraction on the third dash of a number line cut into **fourths** is _______________________.
5. The fraction on the second dash of a number line cut into **sixths** is _______________________.

Directions: Using your "hops" strategy, identify and label the dashes between **0** and **1** on each number line.

1. 0 1
2. 0 1
3. 0 1
4. 0 1

Directions: Create a number line using the fractional units given and label the dashes between **0** and **1**.

5. Halves

0 1

6. Eighths

0 1

7. Thirds

0 1

Name: ____ G3 U4 Lesson 4 - Let's Try It

Directions: Divide each of the bars into equal pieces. Then, make a number line using the bar diagram.

EX: Make **thirds** out of the whole.

Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Make a number line and label $\frac{1}{3}$ and $\frac{2}{3}$ on the line.

1. Make **fourths** out of the whole.

Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Make a number line and label $\frac{1}{4}$, $\frac{2}{4}$, and $\frac{3}{4}$ on the line.

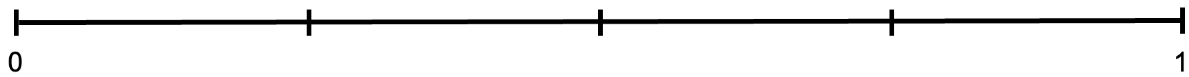
2. Make **sixths** out of the whole.

Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

Make a number line and label $\frac{1}{6}$, $\frac{2}{6}$, $\frac{3}{6}$, $\frac{4}{6}$, and $\frac{5}{6}$ on the line.

Directions: Using your “hops” strategy, identify and label the dashes between **0** and **1** on each number line.

3.



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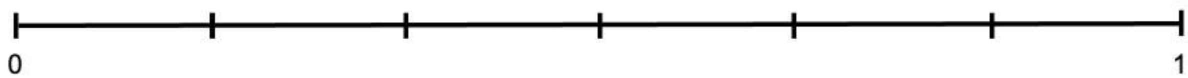

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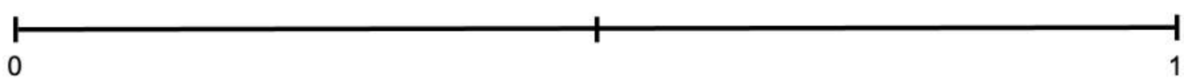

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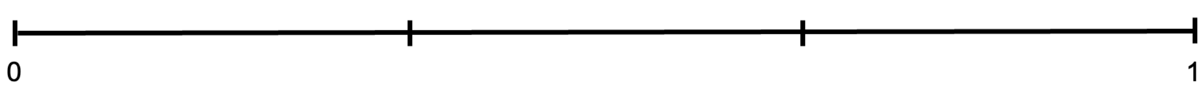

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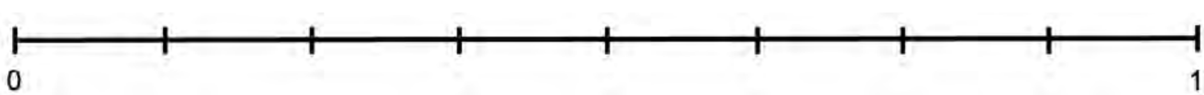


Name: ____ G3 U4 Lesson 4 - Independent Work

Directions: Use the word box to help complete each sentence.

numerator	two-sixths	denominator	equally	three-fourths

1. The dashes on a number line with fractions must be __________________ spaced apart.

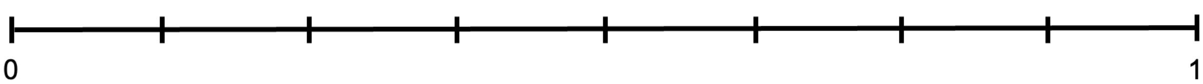
2. The ________________________ is the digit at the top of a fraction and represents **the number of pieces out of the whole** - or the number of pieces being given away.

3. The ________________________ is the digit at the bottom of a fraction and represents the number of **total pieces in the whole**.

4. The fraction on the third dash of a number line cut into **fourths** is ___________________________.

5. The fraction on the second dash of a number line cut into **sixths** is _________________________.

Directions: Using your "hops" strategy, identify and label the dashes between **0** and **1** on each number line.

1.


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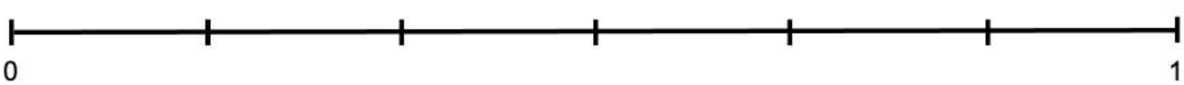

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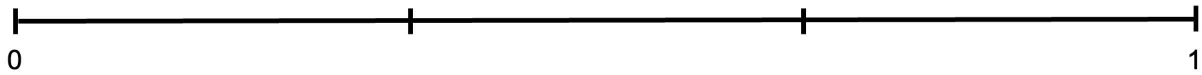

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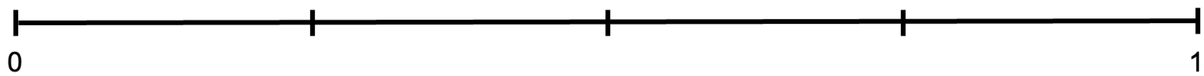
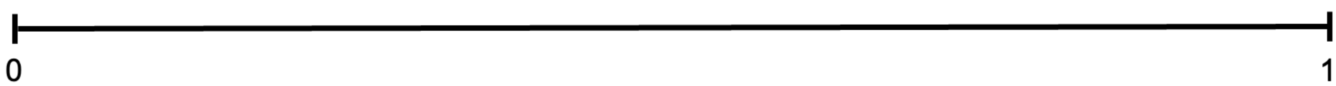
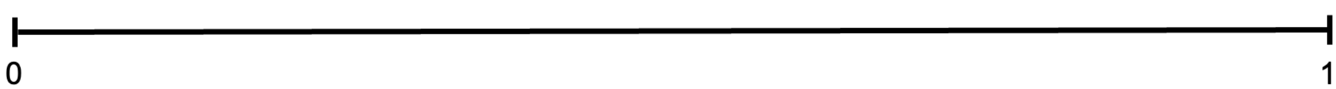


Directions: Create a number line using the fractional units given and label the dashes between **0** and **1**.

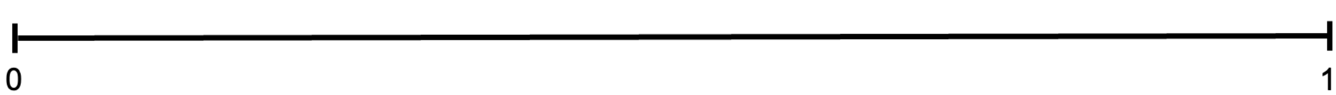
5. Halves



6. Eighths



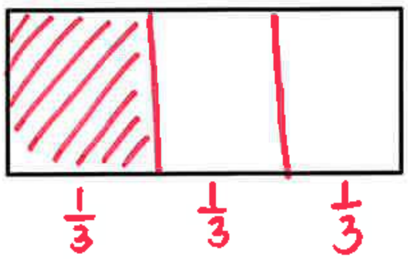
7. Thirds



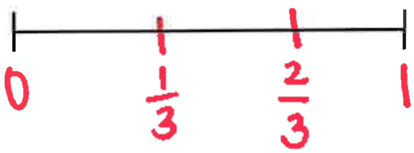
Name: ANSWER KEY

Directions: Divide each of the bars into equal pieces. Then, make a number line using the bar diagram.

EX: Make **thirds** out of the whole.

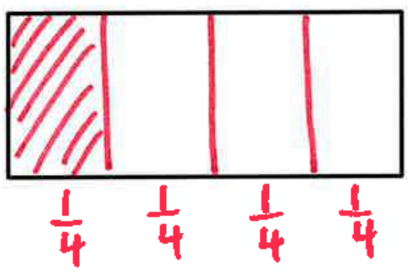


Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

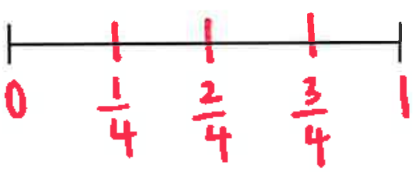


Make a number line and label $\frac{1}{3}$ and $\frac{2}{3}$ on the line.

1. Make **fourths** out of the whole.

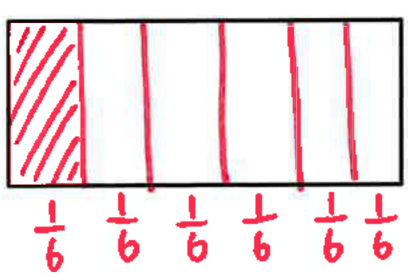


Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.

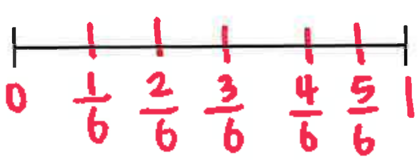


Make a number line and label $\frac{1}{4}$, $\frac{2}{4}$, and $\frac{3}{4}$ on the line.

2. Make **sixths** out of the whole.

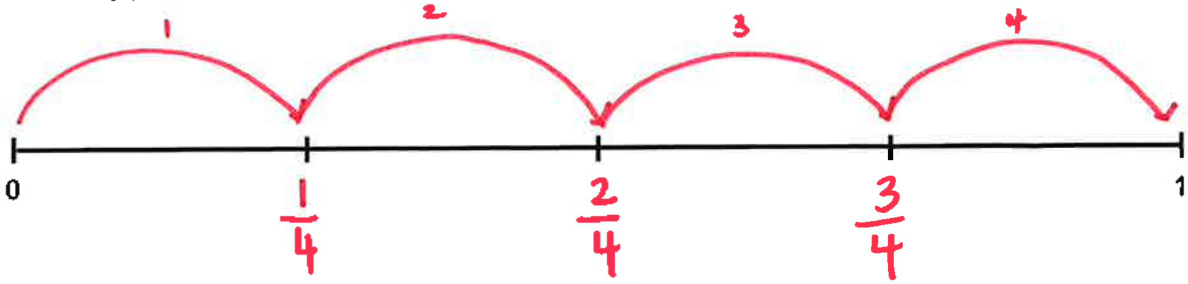


Shade in **one** piece of the fraction.
Now, label each piece of the whole in fraction form.



Make a number line and label $\frac{1}{6}$, $\frac{2}{6}$, $\frac{3}{6}$, $\frac{4}{6}$, and $\frac{5}{6}$ on the line.

Directions: Using your "hops" strategy, identify and label the dashes between **0** and **1** on each number line.

3.


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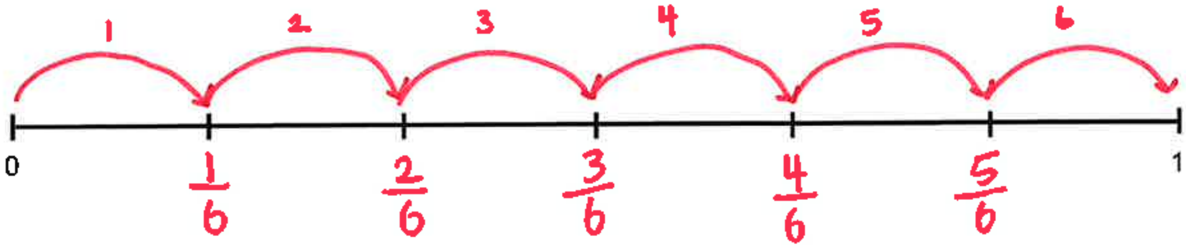

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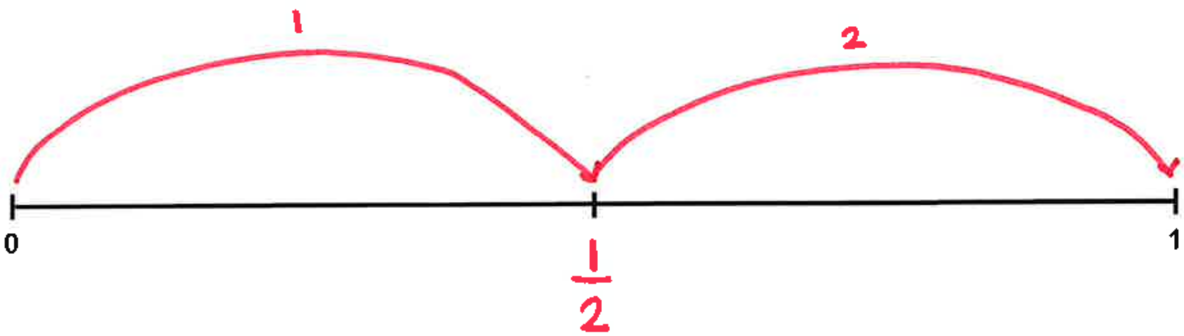

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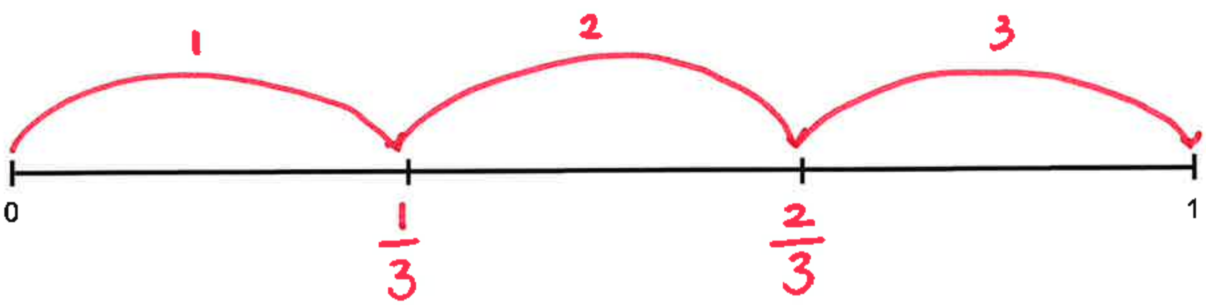

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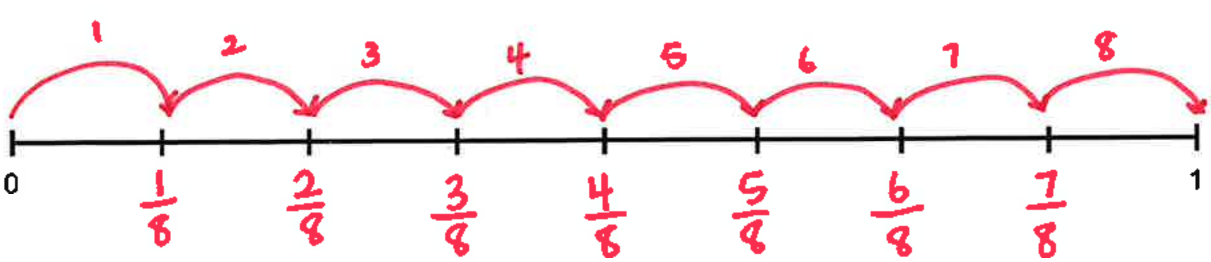


Name: ANSWER KEY

Directions: Use the word box to help complete each sentence.

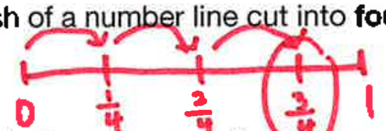
numerator	**two-sixths**	**denominator**	**equally**	**three-fourths**

1. The dashes on a number line with fractions must be equally spaced apart.

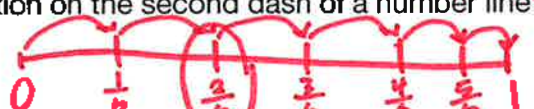
2. The numerator is the digit at the top of a fraction and represents **the number of pieces out of the whole** - or the number of pieces being given away.

3. The denominator is the digit at the bottom of a fraction and represents the number of **total pieces in the whole**.

4. The fraction on the third dash of a number line cut into **fourths** is $\frac{3}{4}$.

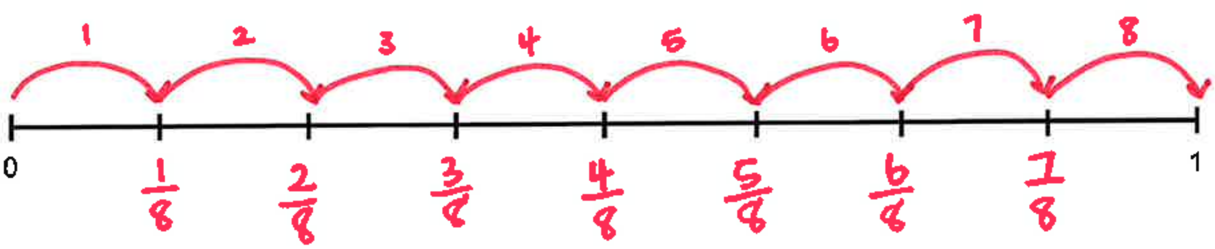


5. The fraction on the second dash of a number line cut into **sixths** is $\frac{2}{6}$.



Directions: Using your "hops" strategy, identify and label the dashes between **0** and **1** on each number line.

1.



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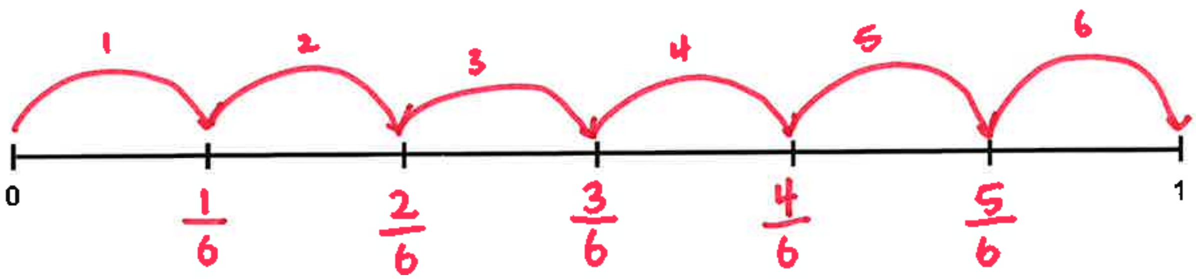

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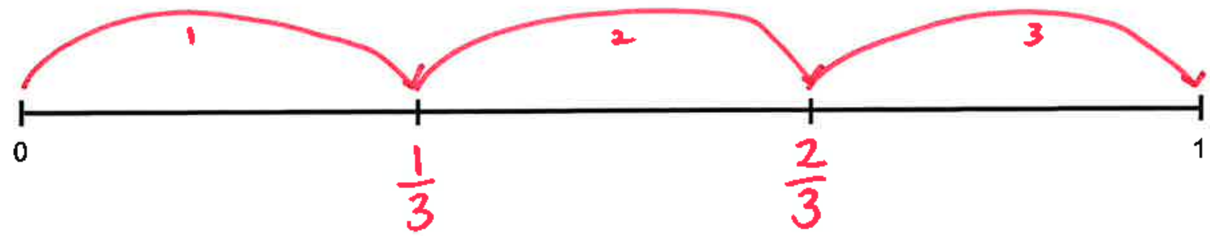

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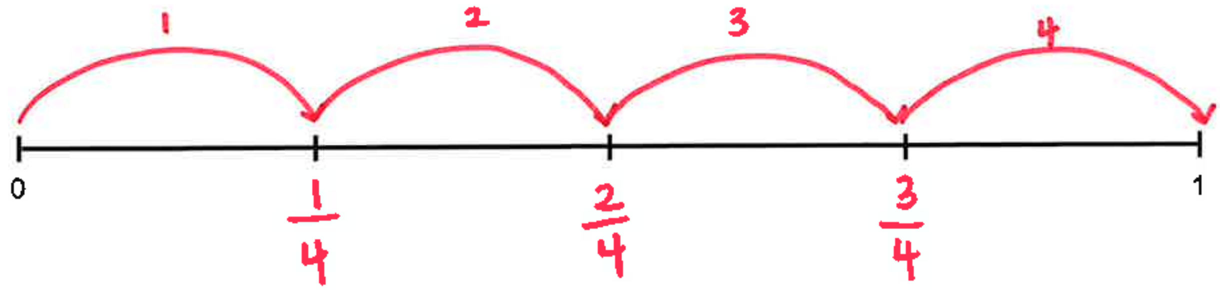
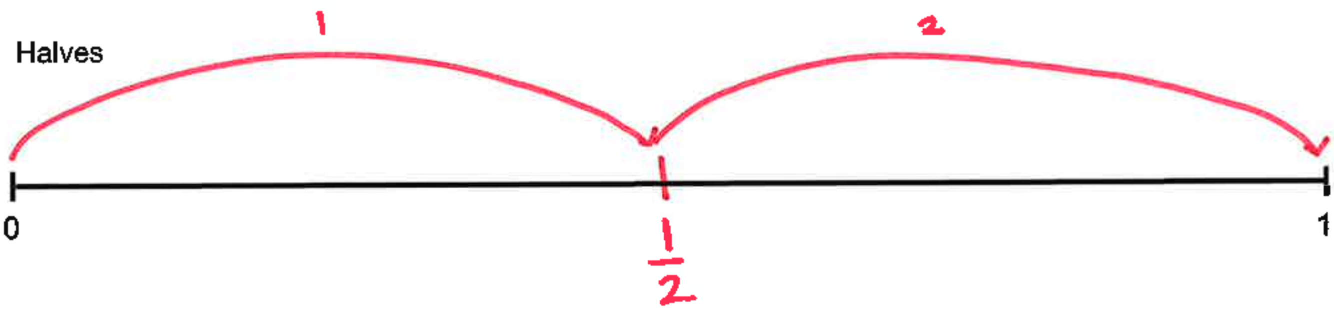
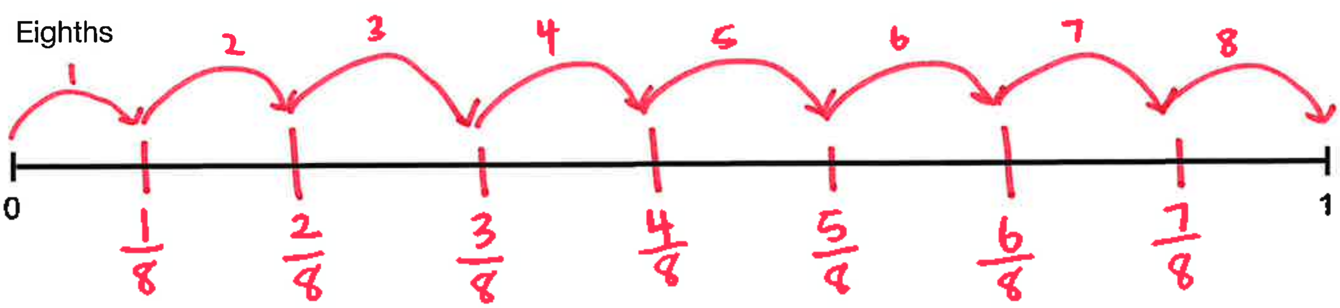


Directions: Create a number line using the fractional units given and label the dashes between **0** and **1**.

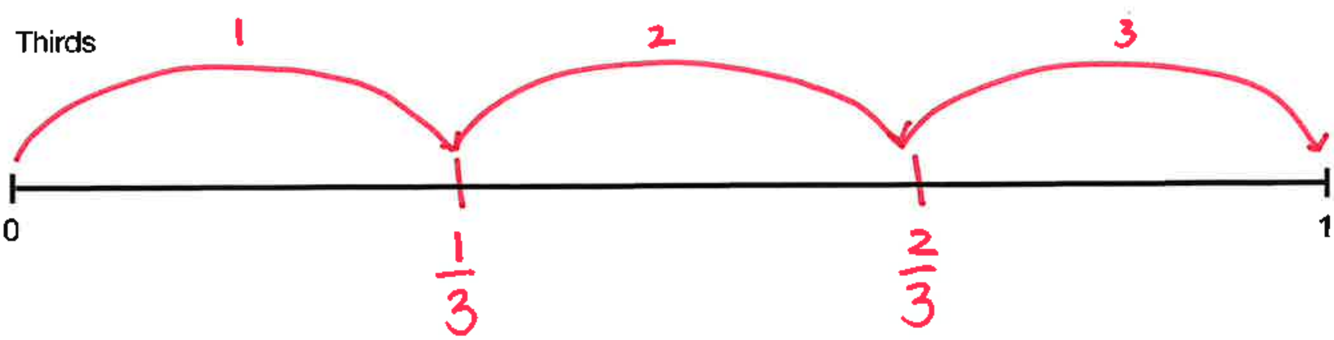
5. Halves



6. Eighths



7. Thirds



G3 U4 Lesson 5

Represent parts of one whole using number bonds

CITYTUTOR DC

G3 U4 Lesson 5 - Students will represent parts of one whole using number bonds

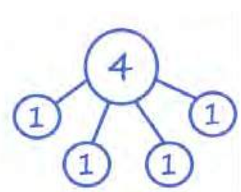
Warm Welcome (Slide 1): Tutor choice.

Frame the Learning/Connect to Prior Learning (Slide 2): Today we're moving from showing fractions with bars and number lines to showing fractions with a number bond! This isn't going to change anything we know about fractions - we still think of each part as equal sized pieces. The numerator still tells us the number of pieces we're working with and the denominator still tells us the total number of pieces in our whole. The only thing that will change is how we represent it!

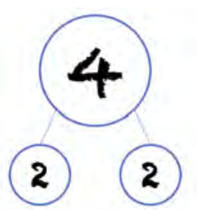
Let's Talk (Slide 3): Before we start, let's do a quick review. How many fourths are there in one whole? How do you know? Possible Student Answers, Key Points:

- There are 4 fourths in one whole because fourths tells me that the whole is divided into four parts.
- The unit name "fourths" tells me that there are four pieces in one whole. If I have a Snickers bar cut into fourths, then I have four pieces of one Snickers bar.

Let's Think (Slide 4): In the past few lessons, we've practiced representing fractions with bar models and number lines. Each way we represent one whole still shows us that there are four total pieces in a whole. Today, when we practice using number bonds, we're still representing the pieces that can be found in one whole.
Touch your nose if you've ever used number bonds before. Well, number bonds are something we can use to represent all sorts of numbers and combinations of numbers. I use a number bond to help divide a whole into useful parts.

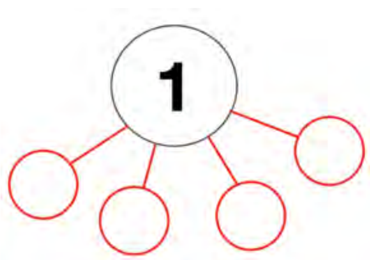


Let's think about how we can use a number bond to show how me and my three friends wanted to share my 4 Snickers bars, I can use my number bond to show how many Snickers bars each of us would get. I'm going to use the top circle to represent the whole, which is 4 Snickers bars. And then I can show the parts that make up the whole, to show that we each get 1 Snickers bar. So, now, my number bond shows that my **whole** is 4 and I'm taking 4 and dividing them into groups of one.



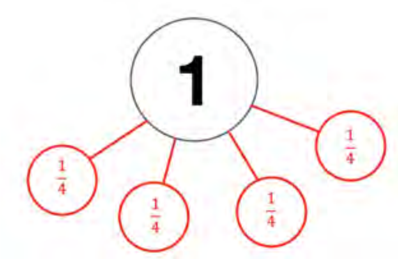
Or, if I want to split the 4 snickers between 2 people, each of us would get 2 Snickers each so I could use a number bond to show that 4 is the whole, and the two parts that make up 4 are 2 and 2.

Let's Think (Slide 5): But what if my whole is only **1**? What kind of number would I get if I take **one** whole and break it up into equal pieces? Fractions! So, let's say I only have **one** Snickers bar and I want to share it between me and my three friends. How many pieces will I need to divide my Snickers bar into? You will need to divide it into fourths because you're taking one whole and dividing it into 4 equal pieces.

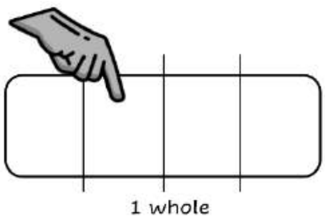


If I'm going to break my whole into 4 pieces, then I need to draw 4 lines to show that I'm dividing my whole into 4 parts. What will be the size of each piece once I divide it into four pieces? And, how would I represent that as a number? Possible Student Answers, Key Points:

- *The size of each piece will be one-fourth of the Snickers bar.*
- *You can represent it as* $\frac{1}{4}$.



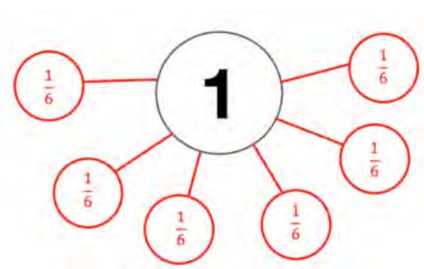
Now I'm going to write ¼ in each of the circles to show what the whole is split into. This 1 whole is split into 4 fourths, ¼ and ¼ and ¼ and ¼. Here, I see that there are 4 ¼s that make up 1 whole.



Now, let me make sure that the number bond is correct by checking my work with a bar model. I'm going to start with 1 whole and cut it into fourths, or four equal pieces. Each of these pieces is ¼ of the whole (*point and name*), so the whole is split into four equal-sized pieces which are each called ¼.

Let's Think (Slide 6): Let's try another one together. It says, "Divide the whole into sixths" Hmm, **how would you use your number bond to do this?** Possible Student Answers, Key Points:

- I will draw six lines and circles coming out of the top circle because sixths means six pieces.
- Each circle represents one of the six pieces, so the fraction is $\frac{1}{6}$ in each circle.



That's right, we're starting with 1 whole and we're cutting it into six equal-sized pieces, or sixths. So we can show that we cut 1 whole into sixths. That means that we have six ⅙ that make up 1 whole. And, if we're confused, we can always go back to a bar model to help us represent fractions with number bonds.

Let's Try it (Slides 7-8): So, today as we practice, remember that a number bond is not so different from a fraction bar or a number line. It's showing the same information just in a different way. The top circle tells us what our **whole** is and the circles coming out of it tell us the pieces that make up the whole.

WARM WELCOME

Today we will represent parts of one whole using number bonds.

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Let’s Talk:

How many fourths are in one whole?

Let’s Think:

Have you ever used number bonds before?

Let’s use a number bond to show how I can split 4 Snickers with 4 people.

Let’s Think:

Divide the whole into fourths.

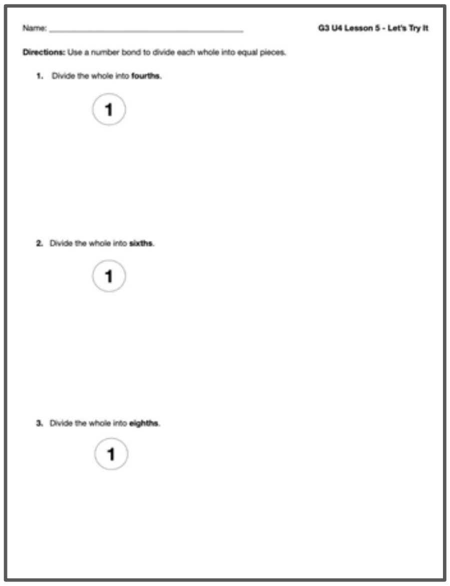
1

Let’s Think:

Divide the whole into sixths.

1

Let's Try It:


Name: ______________________ G3 U4 Lesson 5 - Let's Try It

Directions: Use a number bond to divide each whole into equal pieces.

1. Divide the whole into **fourths**.

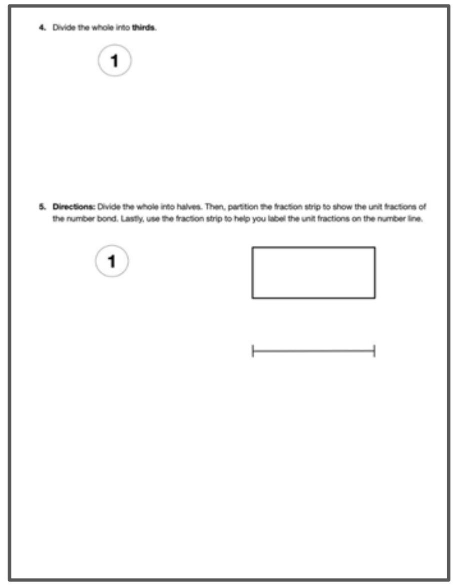
1

2. Divide the whole into **sixths**.

1

3. Divide the whole into **eighths**.

1

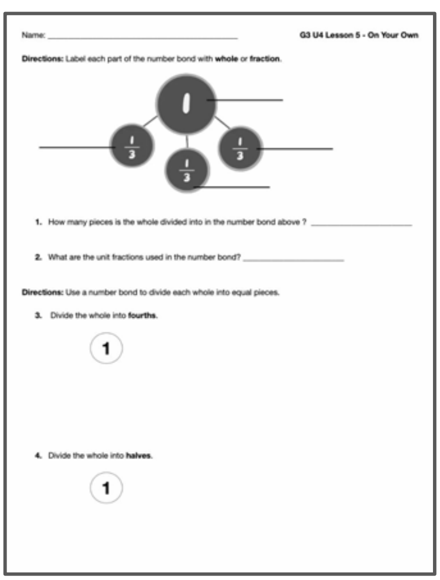

4. Divide the whole into **thirds**.

1

5. **Directions:** Divide the whole into halves. Then, partition the fraction strip to show the unit fractions of the number bond. Lastly, use the fraction strip to help you label the unit fractions on the number line.

1

On your Own:


Name: ______________________ G3 U4 Lesson 5 - On Your Own

Directions: Label each part of the number bond with **whole** or **fraction**.

1

$\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$

1. How many pieces is the whole divided into in the number bond above ? ______________

2. What are the unit fractions used in the number bond? ______________

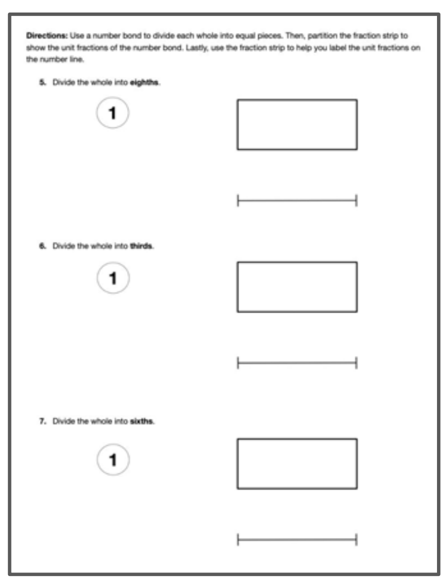
Directions: Use a number bond to divide each whole into equal pieces.

3. Divide the whole into **fourths**.

1

4. Divide the whole into **halves**.

1


Directions: Use a number bond to divide each whole into equal pieces. Then, partition the fraction strip to show the unit fractions of the number bond. Lastly, use the fraction strip to help you label the unit fractions on the number line.

5. Divide the whole into **eighths**.

1

6. Divide the whole into **thirds**.

1

7. Divide the whole into **sixths**.

1

Directions: Use a number bond to divide each whole into equal pieces.

1. Divide the whole into **fourths**.

1

2. Divide the whole into **sixths**.

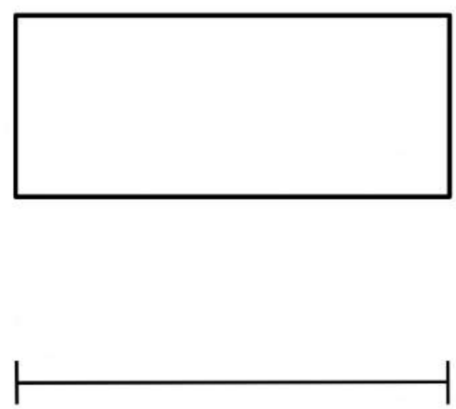
1

3. Divide the whole into **eighths**.

1

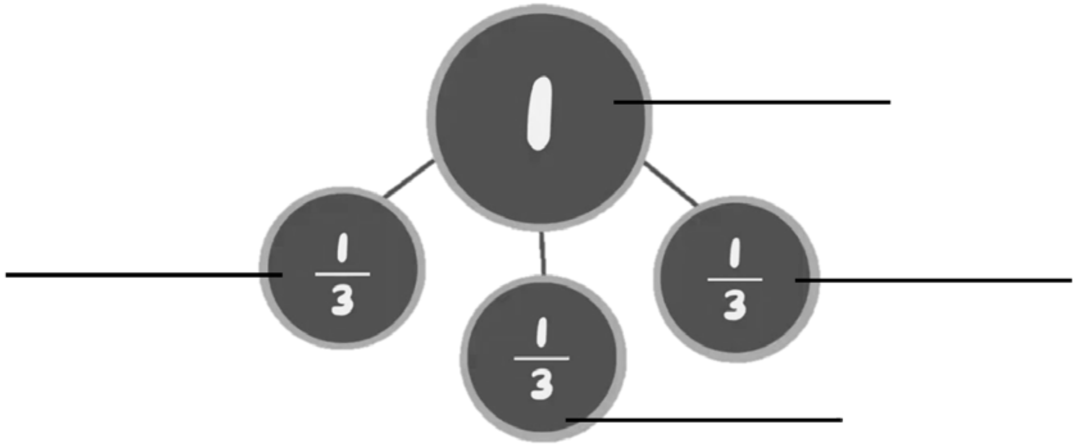
4. Divide the whole into **thirds**.

5. **Directions:** Divide the whole into halves. Then, partition the fraction strip to show the unit fractions of the number bond. Lastly, use the fraction strip to help you label the fractions on the number line.



Name: ____ **G3 U4 Lesson 5 - Independent Work**

Directions: Label each part of the number bond with **whole** or **fraction**.



1. How many pieces is the whole divided into in the number bond above ? ________________________

2. What are the unit fractions used in the number bond? ________________________

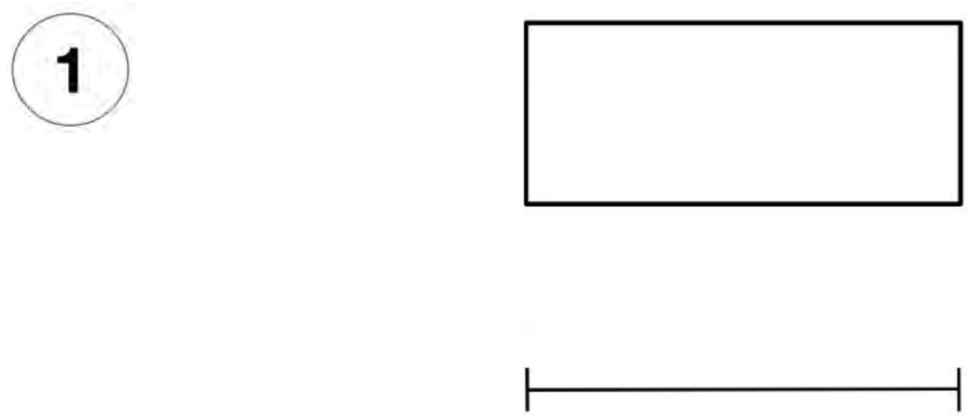
Directions: Use a number bond to divide each whole into equal pieces.

3. Divide the whole into **fourths**.

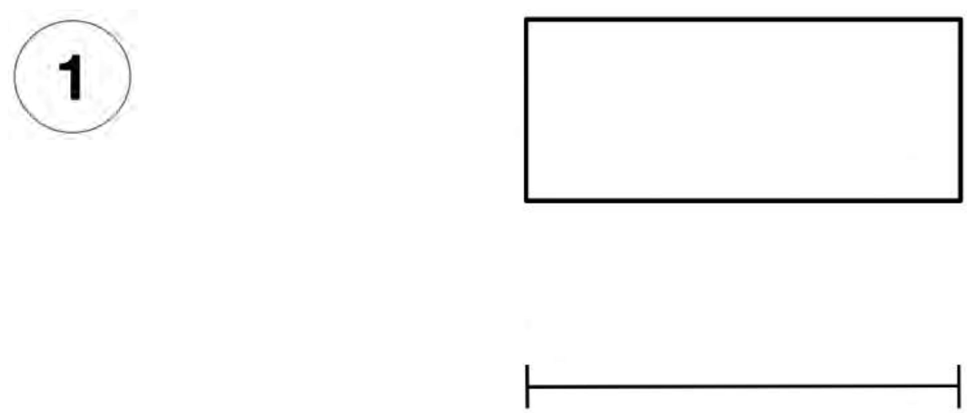
4. Divide the whole into **halves**.

Directions: Use a number bond to divide each whole into equal pieces. Then, partition the fraction strip to show the unit fractions of the number bond. Lastly, use the fraction strip to help you label the fractions on the number line.

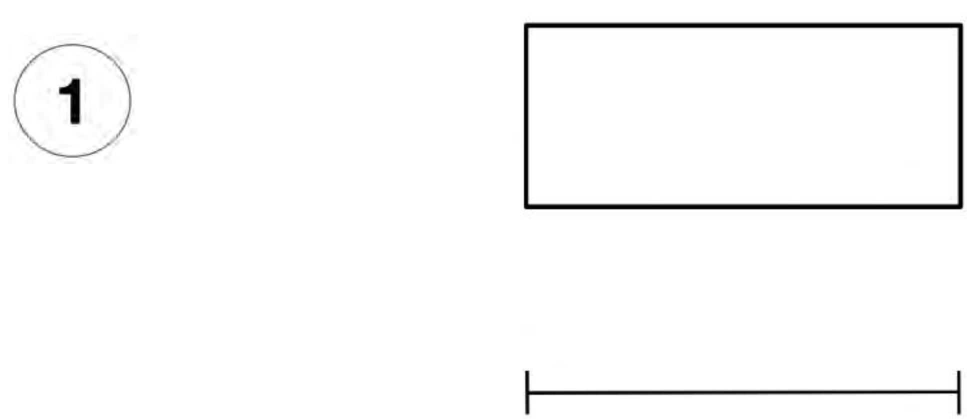
5. Divide the whole into **eighths**.



6. Divide the whole into **thirds**.



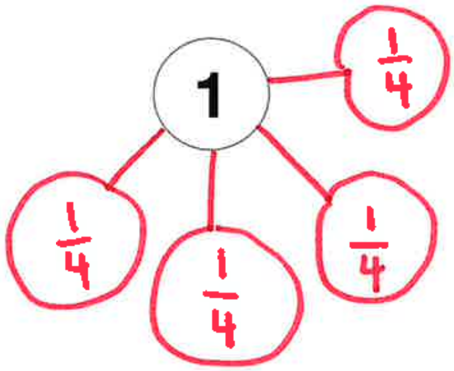
7. Divide the whole into **sixths**.



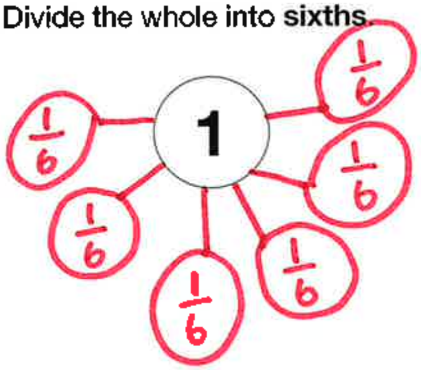
Name: ANSWER KEY

Directions: Use a number bond to divide each whole into equal pieces.

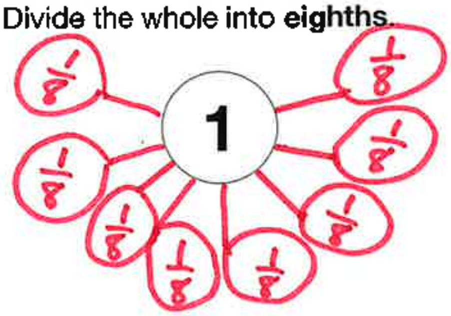
1. Divide the whole into **fourths.**



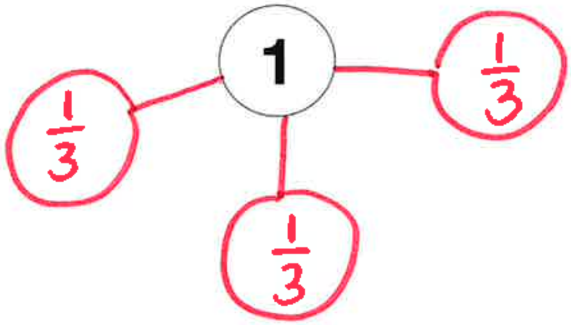
2. Divide the whole into **sixths.**



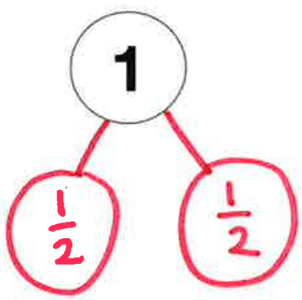
3. Divide the whole into **eighths.**

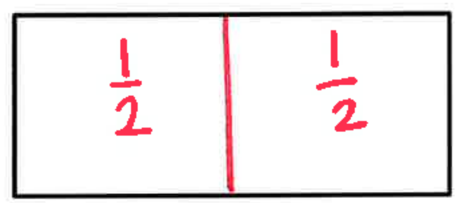


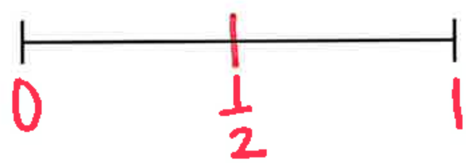
4. Divide the whole into **thirds**.



5. **Directions:** Divide the whole into halves. Then, partition the fraction strip to show the unit fractions of the number bond. Lastly, use the fraction strip to help you label the unit fractions on the number line.

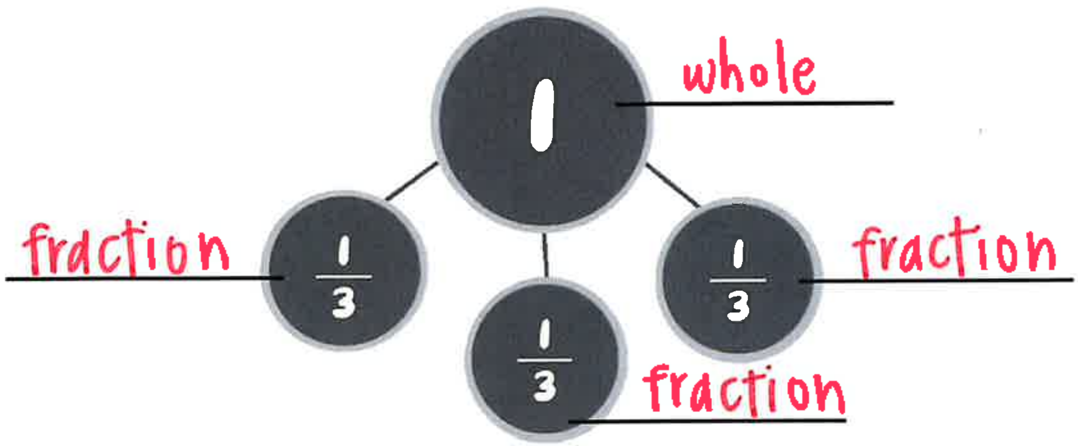






Name: ANSWER KEY

Directions: Label each part of the number bond with **whole** or **fraction**.

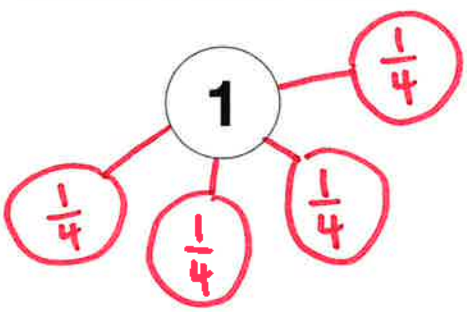


1. How many pieces is the whole divided into in the number bond above ? three pieces

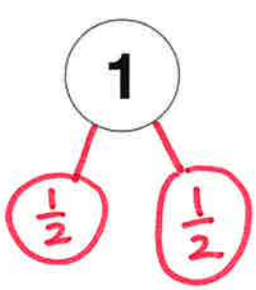
2. What are the unit fractions used in the number bond? $\frac{1}{3}$

Directions: Use a number bond to divide each whole into equal pieces.

3. Divide the whole into **fourths**.

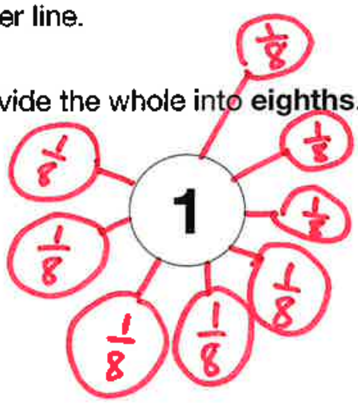


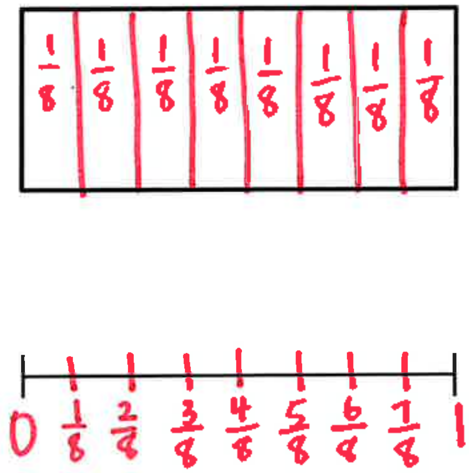
4. Divide the whole into **halves**.



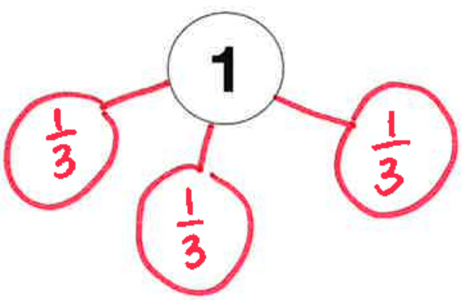
Directions: Use a number bond to divide each whole into equal pieces. Then, partition the fraction strip to show the unit fractions of the number bond. Lastly, use the fraction strip to help you label the ~~unit~~ fractions on the number line.

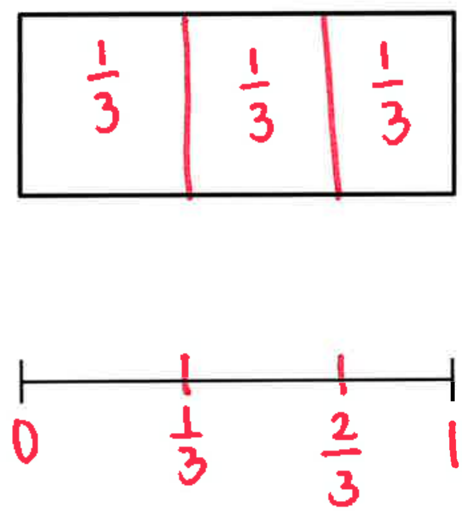
5. Divide the whole into **eighths**.



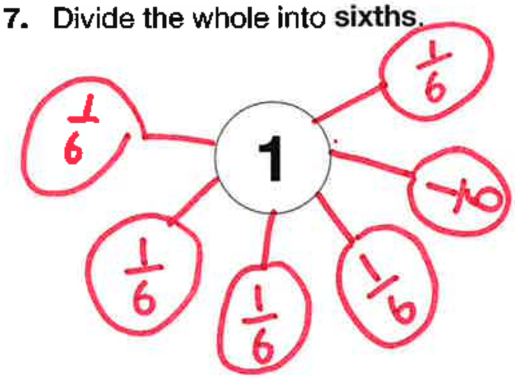


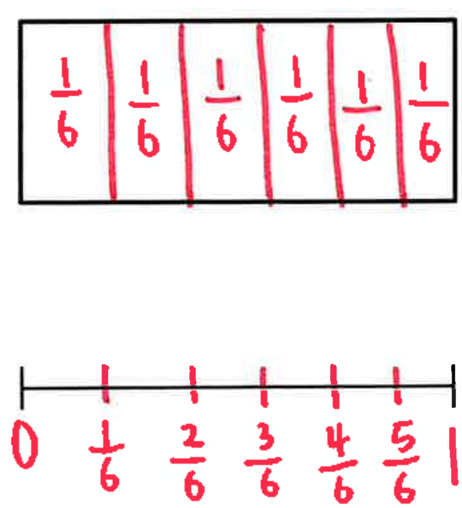
6. Divide the whole into **thirds**.





7. Divide the whole into **sixths**.





G3 U4 Lesson 6

Solve fraction story problems

G3 U4 Lesson 6 - Students will solve fraction story problems

Warm Welcome (Slide 1): Tutor choice.

Frame the Learning/Connect to Prior Learning (Slide 2): The last five lessons have all been about understanding fractions - what they are and what strategies we can use to show fraction units. Today, we're going to take up a notch and start solving problems that involve fractions. We'll read a story problem and then figure out what strategy we can use to solve it!

Let's Talk (Slide 3): We've used Snickers bars as an example of something we would need to divide into fractional units. But there are a LOT of things people divide into fractional units when they're sharing with people. Like, pizza! **When have you had to take one whole pizza and share it in fractional pieces with people? What other whole items have you shared in fractional units?**

Let's Think (Slide 4): Let's look at this story problem. Listen as I read it, "Malik baked a pie with his grandmother for Thanksgiving. They divided the pie into eight slices. Before dinner, Malik's cousins ate two slices. What fraction of the pie is left for the rest of the family?"

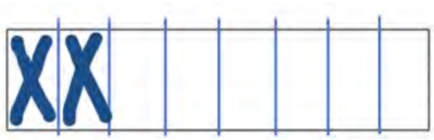
So, our job now is to think about what strategy we could use to solve this problem. Before we solve, let's review the three strategies we've learned about. What strategies have we used to show our work with fractions? Possible Student Answers, Key Points:

- We've used fraction strips/bars to draw out a whole and break it into equal pieces.
- We've used number lines to divide a whole into equal parts.
- We've used a number bond to show a whole and then how many pieces are in it when we divide it equally.

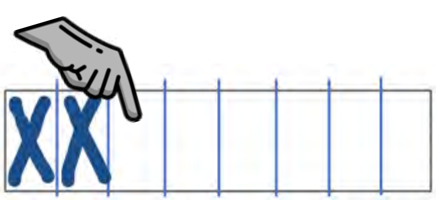
Let me think. What would be the best strategy to use for this problem? I could use a fraction strip to draw out the pieces of the pie and see what's left. I know pies are round, but it's easier to draw a rectangle and I can split a rectangle into equal pieces better than a circle. So, I'm going to work with a rectangle for now.

Okay, this is one whole pie. Now, let's read the problem again to figure out what we need to do next.

It tells me that Malik divided the pie into eight slices, so I'm going to divide my fraction strip into 8. Now that I have 8 slices of the pie, I'm going to look back at the problem to make sure I have all the right information.



(Read the problem aloud again) So, his cousins ate 2 of the slices. I'm going to **X** out **two** of my pieces to show that they're eaten, or gone!



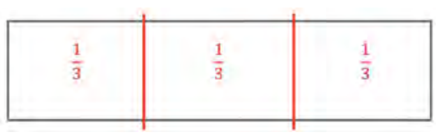
The problem wants to know how much pie is left for the rest of the family. Let me count my remaining pieces. So, I have 6 slices of pie left! The question asks, "What **fraction** of the pie is left…," so I will give my answer in fraction form. Well, 6 is the number of slices Malik has left and the **whole** pie was 8 slices, so there were 6 out of 8 slices left.

The fraction is $\frac{6}{8}$. My final answer is $\frac{6}{8}$ of the pie is left! When I'm answering story problems, I need to make sure I use the right units to describe my fraction. Here I'm talking about **pie** so I need to make sure my answer includes that pie!

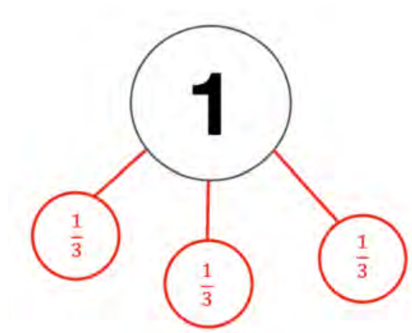
Let's Think (Slide 5): Ok, now you're going to try. Let's read the problem aloud first. So, what's our first step? Pick a strategy! What makes the most sense to use here - a fraction strip, a number line, or a number bond?

Note: *If students are unsure, encourage them to use a number bond here. Number lines are usually better used for distances, time, and fractions greater than a whole - although students don't need to know that at this point. But all strategies will work for this problem.)*

Now, let's draw out our fraction strip/number bond. Go back and re-read the problem to make sure you know what you're doing with the whole.



Ok, so what's our next step? Makinzie is sharing the cupcake with three people, so I need to divide the whole into three pieces.



Let's look back at the problem once more. Have you shown the work correctly? What answer does the question need?

Right! The question is asking what unit fraction would each girl get? They would each get ⅓ *of the cupcake*! Don't forget to add on the units that describe our fraction. Here we're talking about units of cupcake!

Let's Try it (Slides 6-7): So, today as we practice, remember that it's important to read through a story problem to understand what strategy would help you best solve the problem. We've learned about three strategies to help us think about fractions - drawing fraction bars/strips, number lines, and number bonds. And lastly, once you've found your answer don't forget to include the unit that describes your fraction - it might be cupcakes, pizzas, pies, whatever!

WARM WELCOME

Today we will solve fraction story problems.

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Let's Talk:

When have you had to take one **whole** pizza and share it in fractional pieces with people?

What other **whole** items have you shared in fractional units?

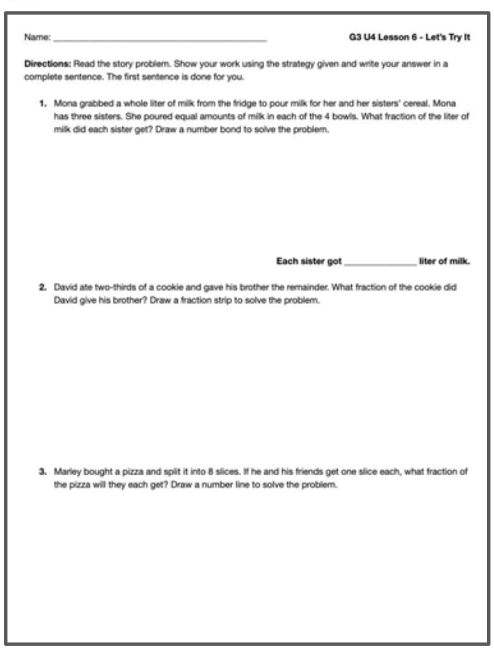
Let's Think:

Malik baked a pie with his grandmother for Thanksgiving. They divided the pie into eight slices. Before dinner, Malik's cousins ate two slices. What fraction of the pie is left for the rest of the family?

Let's Think:

Makinzie brought a cupcake home from a birthday party. She wanted to share it with her two little sisters. What fraction of the cupcake would each sister get if Makinzie made sure to give her and her sister equal pieces?

Let's Try It:



Name: ______________________ **G3 U4 Lesson 6 - Let's Try It**

Directions: Read the story problem. Show your work using the strategy given and write your answer in a complete sentence. The first sentence is done for you.

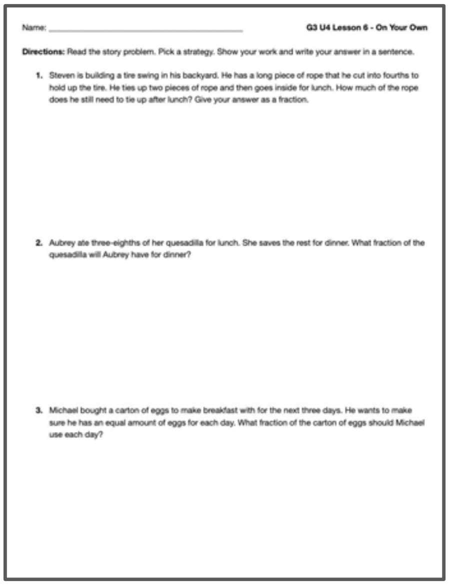
1. Mona grabbed a whole liter of milk from the fridge to pour milk for her and her sisters' cereal. Mona has three sisters. She poured equal amounts of milk in each of the 4 bowls. What fraction of the liter of milk did each sister get? Draw a number bond to solve the problem.

Each sister got ____________ liter of milk.

2. David ate two-thirds of a cookie and gave his brother the remainder. What fraction of the cookie did David give his brother? Draw a fraction strip to solve the problem.

3. Marley bought a pizza and split it into 8 slices. If he and his friends get one slice each, what fraction of the pizza will they each get? Draw a number line to solve the problem.

On your Own:



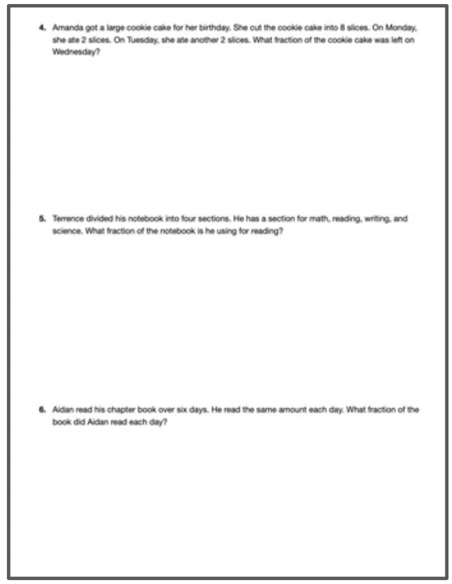
Name: ______________________ **G3 U4 Lesson 6 - On Your Own**

Directions: Read the story problem. Pick a strategy. Show your work and write your answer in a sentence.

1. Steven is building a tire swing in his backyard. He has a long piece of rope that he cut into fourths to hold up the tire. He ties up two pieces of rope and then goes inside for lunch. How much of the rope does he still need to tie up after lunch? Give your answer as a fraction.

2. Aubrey ate three-eighths of her quesadilla for lunch. She saves the rest for dinner. What fraction of the quesadilla will Aubrey have for dinner?

3. Michael bought a carton of eggs to make breakfast with for the next three days. He wants to make sure he has an equal amount of eggs for each day. What fraction of the carton of eggs should Michael use each day?



4. Amanda got a large cookie cake for her birthday. She cut the cookie cake into 8 slices. On Monday, she ate 2 slices. On Tuesday, she ate another 2 slices. What fraction of the cookie cake was left on Wednesday?

5. Terrence divided his notebook into four sections. He has a section for math, reading, writing, and science. What fraction of the notebook is he using for reading?

6. Aidan read his chapter book over six days. He read the same amount each day. What fraction of the book did Aidan read each day?

Directions: Read the story problem. Show your work using the strategy given and write your answer in a complete sentence. The first sentence is done for you.

1. Mona grabbed a whole liter of milk from the fridge to pour milk for her and her sisters' cereal. Mona has three sisters. She poured equal amounts of milk in each of the 4 bowls. What fraction of the liter of milk did each sister get? Draw a number bond to solve the problem.

Each sister got _______________ liter of milk.

2. David ate two-thirds of a cookie and gave his brother the remainder. What fraction of the cookie did David give his brother? Draw a fraction strip to solve the problem.

3. Marley bought a pizza and split it into 8 slices. If he and his friends get one slice each, what fraction of the pizza will they each get? Draw a number line to solve the problem.

Name: ____ G3 U4 Lesson 6 - Independent Work

Directions: Read the story problem. Pick a strategy. Show your work and write your answer in a sentence.

1. Steven is building a tire swing in his backyard. He has a long piece of rope that he cut into fourths to hold up the tire. He ties up two pieces of rope and then goes inside for lunch. How much of the rope does he still need to tie up after lunch? Give your answer as a fraction.

2. Aubrey ate three-eighths of her quesadilla for lunch. She saves the rest for dinner. What fraction of the quesadilla will Aubrey have for dinner?

3. Michael bought a carton of eggs to make breakfast with for the next three days. He wants to make sure he has an equal amount of eggs for each day. What fraction of the carton of eggs should Michael use each day?

4. Amanda got a large cookie cake for her birthday. She cut the cookie cake into 8 slices. On Monday, she ate 2 slices. On Tuesday, she ate another 2 slices. What fraction of the cookie cake was left on Wednesday?

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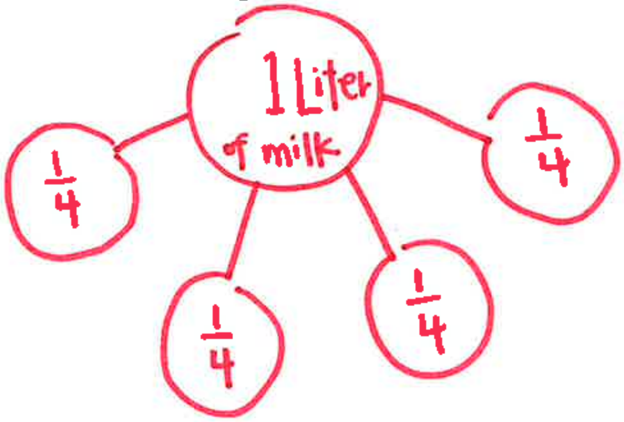
6. Aidan read his chapter book over six days. He read the same amount each day. What fraction of the book did Aidan read each day?

Name: ANSWER KEY

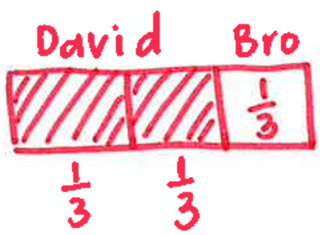
Directions: Read the story problem. Show your work using the strategy given and write your answer in a complete sentence. The first sentence is done for you.

1. Mona grabbed a whole liter of milk from the fridge to pour milk for her and her sisters' cereal. Mona has three sisters. She poured equal amounts of milk in each of the 4 bowls. What fraction of the liter of milk did each sister get? Draw a number bond to solve the problem.



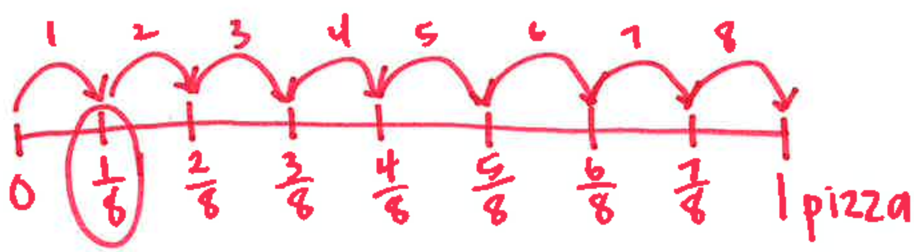
Each sister got $\frac{1}{4}$ **liter of milk.**

2. David ate two-thirds of a cookie and gave his brother the remainder. What fraction of the cookie did David give his brother? Draw a fraction strip to solve the problem.



David gave his brother $\frac{1}{3}$ of the cookie.

3. Marley bought a pizza and split it into 8 slices. If he and his friends get one slice each, what fraction of the pizza will they each get? Draw a number line to solve the problem.

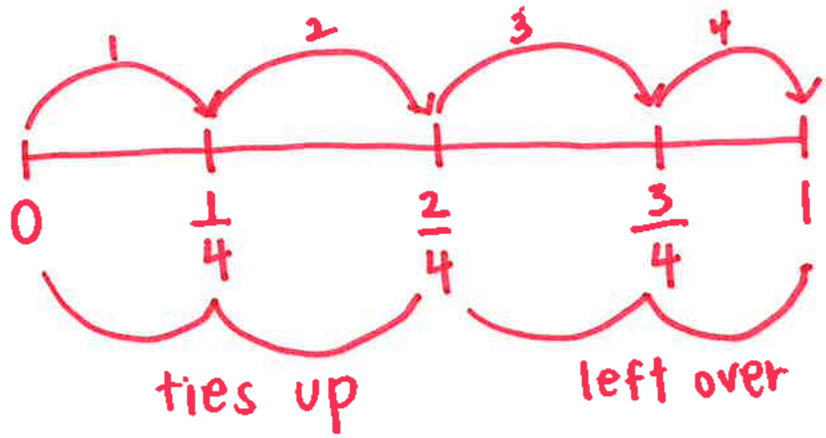


Marley and his friends get $\frac{1}{8}$ slice of pizza each.

Name: ANSWER KEY

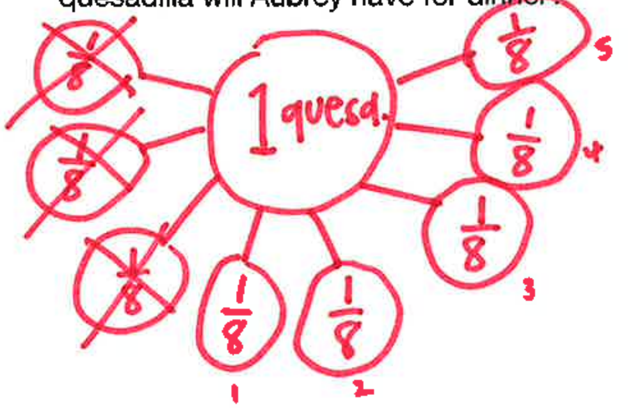
Directions: Read the story problem. Pick a strategy. Show your work and write your answer in a sentence.

1. Steven is building a tire swing in his backyard. He has a long piece of rope that he cut into fourths to hold up the tire. He ties up two pieces of rope and then goes inside for lunch. How much of the rope does he still need to tie up after lunch? Give your answer as a fraction.



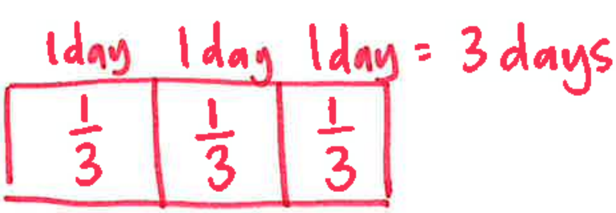
He still has $\frac{2}{4}$ of rope to still tie up.

2. Aubrey ate three-eighths of her quesadilla for lunch. She saves the rest for dinner. What fraction of the quesadilla will Aubrey have for dinner?



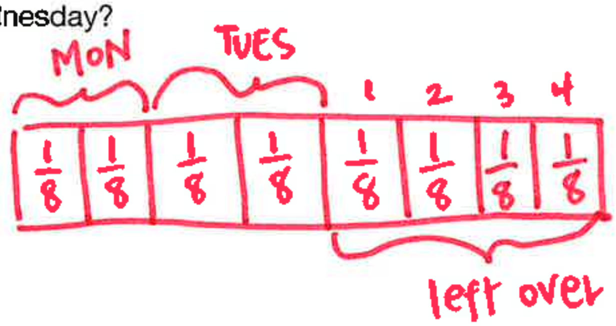
Aubrey has $\frac{5}{8}$ of the quesadilla for dinner.

3. Michael bought a carton of eggs to make breakfast with for the next three days. He wants to make sure he has an equal amount of eggs for each day. What fraction of the carton of eggs should Michael use each day?



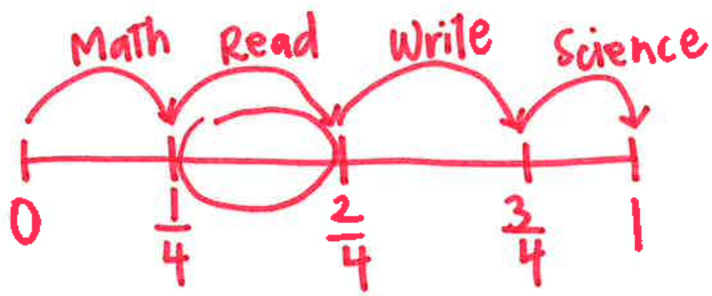
Michael should use $\frac{1}{3}$ of the carton each day.

4. Amanda got a large cookie cake for her birthday. She cut the cookie cake into 8 slices. On Monday, she ate 2 slices. On Tuesday, she ate another 2 slices. What fraction of the cookie cake was left on Wednesday?



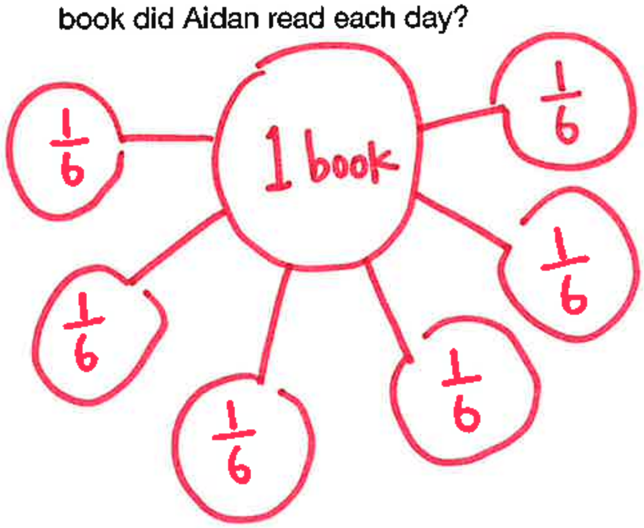
Amanda has $\frac{4}{8}$ of the cookie left.

5. Terrence divided his notebook into four sections. He has a section for math, reading, writing, and science. What fraction of the notebook is he using for reading?



Terrence is using $\frac{1}{4}$ of the notebook for reading.

6. Aidan read his chapter book over six days. He read the same amount each day. What fraction of the book did Aidan read each day?



Aidan read $\frac{1}{6}$ of his chapter book each day.

G3 U4 Lesson 7

Compare unit fractions by reasoning about their size

CITYTUTOR DC

G3 U4 Lesson 7 - Students will compare unit fractions by reasoning about their size

Warm Welcome (Slide 1): Tutor choice.

Frame the Learning/Connect to Prior Learning (Slide 2): You all have become such experts at drawing fractions! Today, your expert drawing skills will be used to *compare* fractions! Thinking about our numerator and denominator, **how might we compare fractions? What does it mean to compare something?**
Possible Student Answers, Key Points:

- We can see which fraction is bigger or smaller.
- We can use pictures to help us compare.
- Comparing means to find if one thing is bigger/smaller/the same as something else.
- We can use symbols to help us compare.

Let's Talk (Slide 3): You're right, when we're comparing something we're figuring out whether one thing is more or less or the exact same as something else. So let's think about pizza. Imagine that I am buying you your favorite pizza for lunch, **would you like ¼ or ½ of it? Why?** Possible Student Answers, Key Points:

- I would choose ½ because that's a larger part of the pizza than ¼.
- I want ½ of the pizza because ½ means the pizza is only cut into two slices, but ¼ means the pizza is cut into four slices. If I only get one of the four slices, I'll have a smaller slice than ½ of a pizza.

Note: Students may not provide these answers - that's fine! That's the whole point of the lesson! If they share wrong answers or can't provide reasoning for the right answer, move on to the next slide!

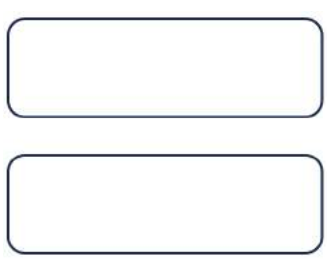
Let's Talk (Slide 4): Take a look at these two pizzas. One is cut into fourths and one is cut into halves. It's important to note that the two whole pizzas are the exact same size. We're not comparing half of a teeny pizza to a fourth of a HUGE pizza. **We can only compare fractions if they're coming from EQUAL sized wholes. Why do you think that is**? Possible Student Answers, Key Points:

- They have to both be the same size because if one pizza is bigger then the size of its pieces will be bigger. If they're the same size, you know that the size of the slices can be compared to each other.
- If one pizza is smaller than the other then their slices will be smaller even if they're only cut into halves.

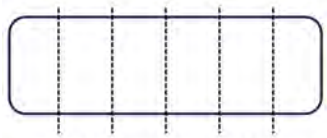
So, which pizza has the larger slices? *½!* Even though 4 is a larger **whole** number, when it's the denominator in a fraction it means the parts in a whole. The more parts, the smaller the pieces! Why does that make sense? Possible Student Answers, Key Points:

- If you keep cutting something the pieces will become smaller. Like if I cut a piece of paper again and again the pieces of paper will get tiny - like confetti!
- The denominator tells you how many people you're sharing with and if you're sharing with 2 people, then you get a bigger piece, but if you're sharing with 4 people you'll get a smaller piece.

Let's Think (Slide 5): Let's look at these two fractions - we have $\frac{1}{6}$ and $\frac{1}{4}$ and I want to compare them. Hmm, with fractions I have to be careful to really think about what I'm comparing. So, I want to figure out whether ⅙ is bigger, smaller, or the same as ¼.

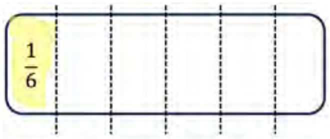


I'm going to start with two separate whole pieces to help me compare the sizes, remember the wholes have to be the exact same size to help me compare.



Now, let me start with ⅙. The denominator is 6 so that means that I am cutting the whole into 6 equal-sized pieces/

And, I am comparing ⅙ to ¼. The denominator is 4 so let me cut the bottom whole into fourths, or four equal-sized pieces.



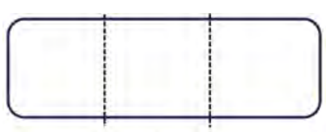
Now, let me shade in the fraction. I see ⅙, which means I have 1 out of 6 pieces, I'll shade that in and label it as ⅙.

And I am comparing ⅙ to ¼. So, I also only have ONE piece, which means I have 1 out of 4 pieces, I'll shade that in and label it as ¼.

$$\frac{1}{6} < \frac{1}{4}$$

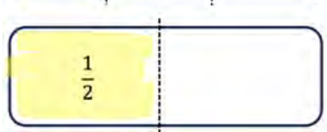
When I look at my models, it helps me compare! If I'm comparing ⅙ to ¼, I know that ⅙ is **less than** ¼. So, I would use my **less than** symbol for my comparison. This makes sense because I had to cut the top model more times, like I had to do with my pizza earlier! The more cuts I make, the smaller the pieces get!

Let's Think (Slide 6): Now, let's think through another comparison. We're comparing ⅓ to ½. Some of you have gotten so good at fractions that I think you already know which is bigger but let's draw a model to prove it.   Again, we're going to start with two separate wholes that are the exact same size.



It says that we're comparing ⅓ to ½. So we need to split the first whole into how many equal-sized pieces? 3! That's right, we're going to split it into thirds.

And, how many equal-sized pieces do we need to split the bottom whole into? 2! That's right, we're going to split it into halves.



Now both of the numerators are ONE, that means that we have one piece out of 3 and one piece out of 2, let's shade in and label one piece in each of the wholes in our fraction model.

So, looking at our two fractions and the size of pieces they represent, which is greater ⅓ or ½? ½! That's right, but remember, when we compare we have to read from left to right. So we'll say that ⅓ is less than ½ and use the less than symbol.

$$\frac{1}{3} < \frac{1}{2}$$

Let's write that comparison down!

Let's Try it (Slides 7): As we work today, remember that our denominator tells us the **size** of our pieces. Take time when you're comparing fractions to think about the differences between the two denominators you're given - when the wholes are EQUAL SIZES. The greater the denominator, the more pieces our whole is divided into - which means the size of the pieces are smaller.

WARM WELCOME

Today we will compare unit fractions by reasoning about their size.

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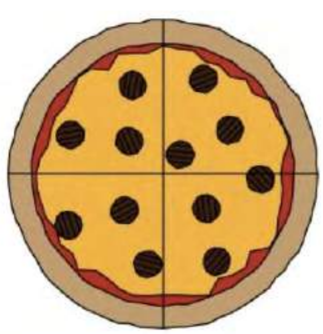
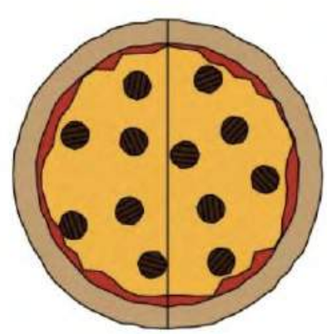
Let's Talk:

If I bought your favorite pizza for lunch, would you want ¼ of it or ½ it? Why?

Let's Talk:

If I bought your favorite pizza for lunch, would you want ¼ of it or ½ it?





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Let's Think:

Compare the two fractions.

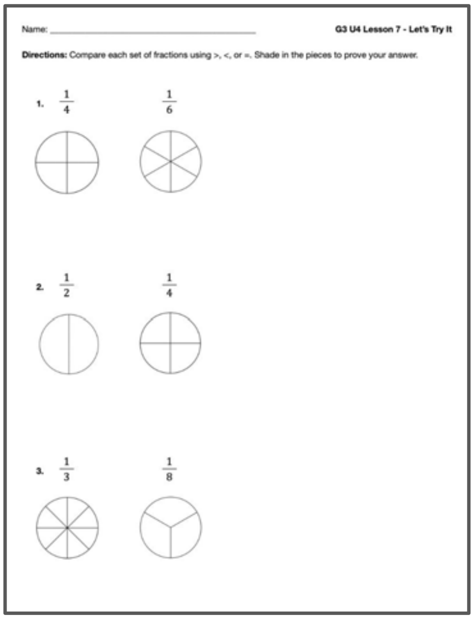
$$\frac{1}{6} \qquad \frac{1}{4}$$

Let's Think:

Compare the two fractions.

$$\frac{1}{3} \qquad \frac{1}{2}$$

Let's Try It:



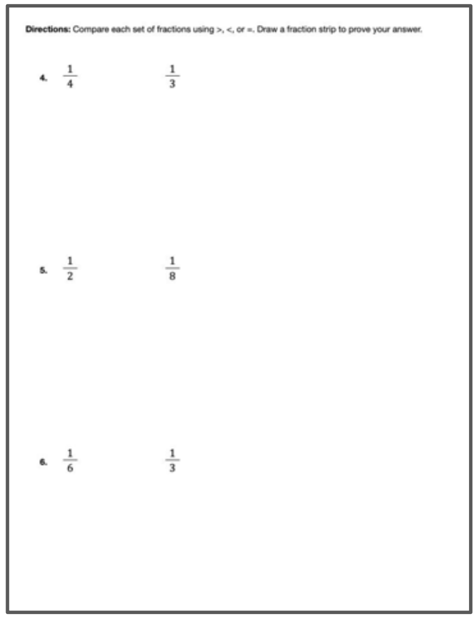
Name: ______________________ **G3 U4 Lesson 7 - Let's Try It**

Directions: Compare each set of fractions using >, <, or =. Shade in the pieces to prove your answer.

1. $\frac{1}{4}$ $\frac{1}{6}$

2. $\frac{1}{2}$ $\frac{1}{4}$

3. $\frac{1}{3}$ $\frac{1}{8}$



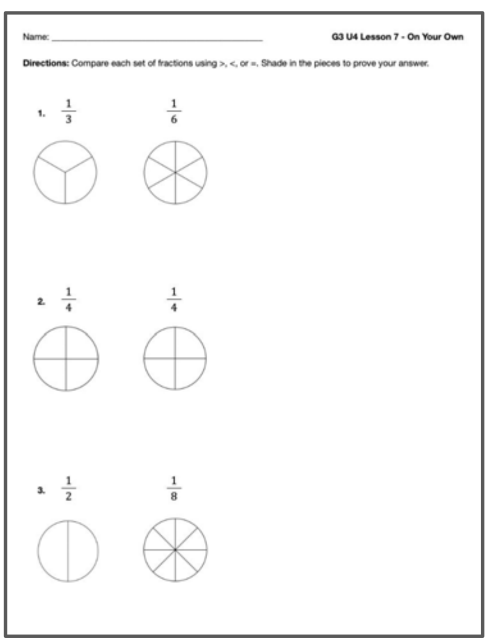
Directions: Compare each set of fractions using >, <, or =. Draw a fraction strip to prove your answer.

4. $\frac{1}{4}$ $\frac{1}{3}$

5. $\frac{1}{2}$ $\frac{1}{8}$

6. $\frac{1}{6}$ $\frac{1}{3}$

On your Own:



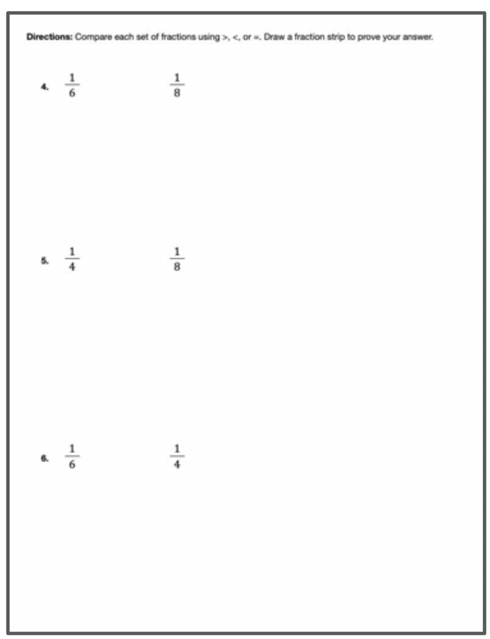
Name: ______________________ **G3 U4 Lesson 7 - On Your Own**

Directions: Compare each set of fractions using >, <, or =. Shade in the pieces to prove your answer.

1. $\frac{1}{3}$ $\frac{1}{6}$

2. $\frac{1}{4}$ $\frac{1}{4}$

3. $\frac{1}{2}$ $\frac{1}{8}$



Directions: Compare each set of fractions using >, <, or =. Draw a fraction strip to prove your answer.

4. $\frac{1}{6}$ $\frac{1}{8}$

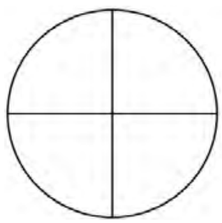
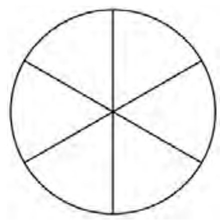
5. $\frac{1}{4}$ $\frac{1}{8}$

6. $\frac{1}{6}$ $\frac{1}{4}$

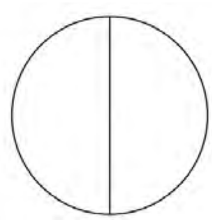
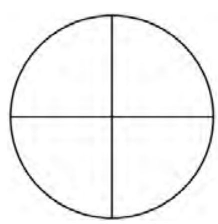
Name: ____

Directions: Compare each set of fractions using >, <, or =. Shade in the pieces to prove your answer.

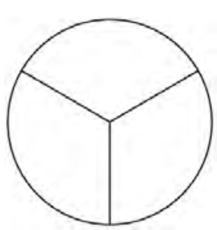
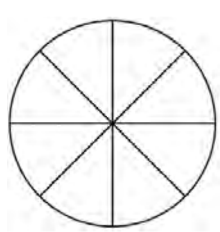
1. $\frac{1}{4}$ $\frac{1}{6}$

2. $\frac{1}{2}$ $\frac{1}{4}$

3. $\frac{1}{3}$ $\frac{1}{8}$

Directions: Compare each set of fractions using >, <, or =. Draw a fraction strip to prove your answer.

4. $\frac{1}{4}$ $\frac{1}{3}$

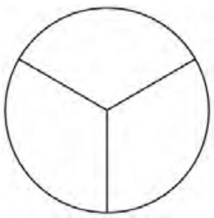
5. $\frac{1}{2}$ $\frac{1}{8}$

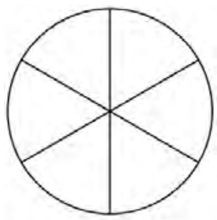
6. $\frac{1}{6}$ $\frac{1}{3}$

Name: ____ **G3 U4 Lesson 7 - Independent Work**

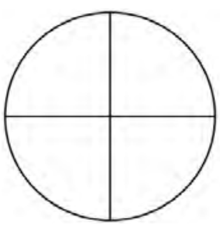
Directions: Compare each set of fractions using >, <, or =. Shade in the pieces to prove your answer.

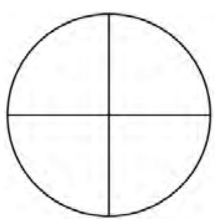
1. $\frac{1}{3}$ $\frac{1}{6}$



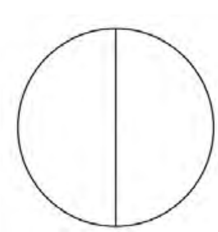


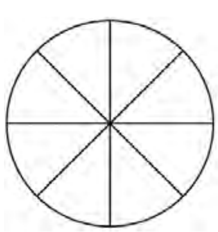
2. $\frac{1}{4}$ $\frac{1}{4}$





3. $\frac{1}{2}$ $\frac{1}{8}$





Directions: Compare each set of fractions using >, <, or =. Draw a fraction strip to prove your answer.

4. $\frac{1}{6}$ $\frac{1}{8}$

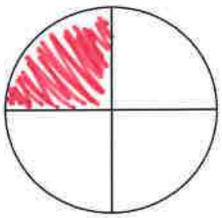
5. $\frac{1}{4}$ $\frac{1}{8}$

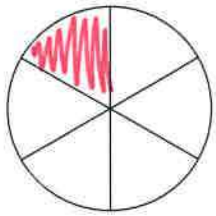
6. When comparing fractions, why do the wholes need to be equal sizes?

Name: ANSWER KEY

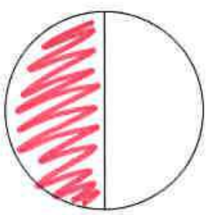
Directions: Compare each set of fractions using >, <, or =. Shade in the pieces to prove your answer.

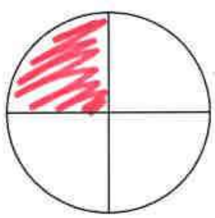
1. $\frac{1}{4} > \frac{1}{6}$



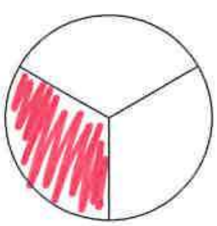


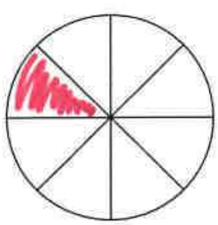
2. $\frac{1}{2} > \frac{1}{4}$





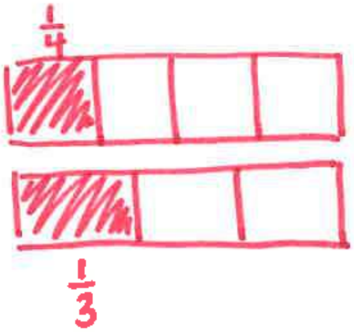
3. $\frac{1}{3} > \frac{1}{8}$



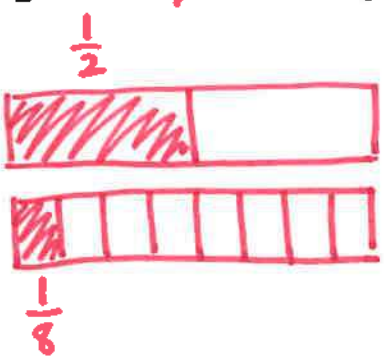


Directions: Compare each set of fractions using >, <, or =. Draw a fraction strip to prove your answer.

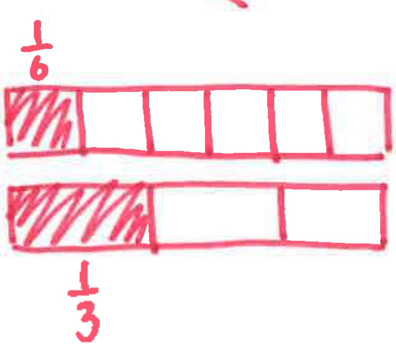
4. $\frac{1}{4} \quad < \quad \frac{1}{3}$



5. $\frac{1}{2} \quad > \quad \frac{1}{8}$



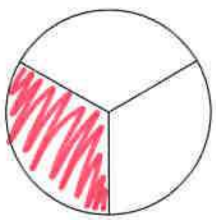
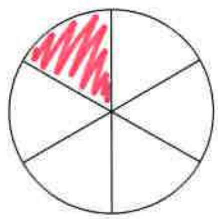
6. $\frac{1}{6} \quad < \quad \frac{1}{3}$



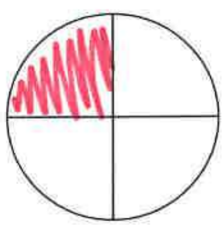
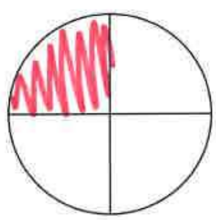
Name: ANSWER KEY

Directions: Compare each set of fractions using >, <, or =. Shade in the pieces to prove your answer.

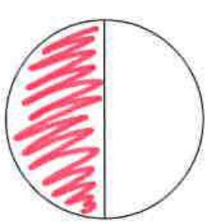
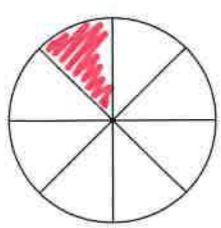
1. $\frac{1}{3}$ > $\frac{1}{6}$

2. $\frac{1}{4}$ = $\frac{1}{4}$

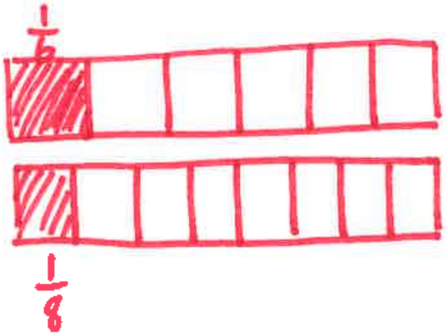



3. $\frac{1}{2}$ > $\frac{1}{8}$

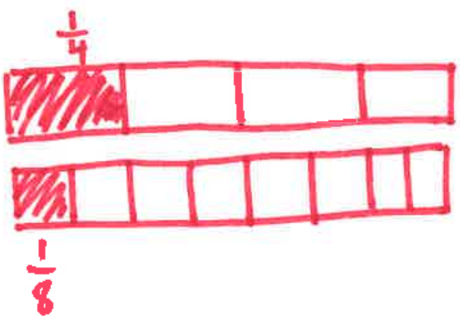



Directions: Compare each set of fractions using >, <, or =. Draw a fraction strip to prove your answer.

4. $\frac{1}{6} > \frac{1}{8}$



5. $\frac{1}{4} > \frac{1}{8}$



6. When comparing fractions, why do the wholes need to be equal sizes?

If the wholes are different sizes, then whichever whole is larger will have the larger size piece. It won't be an equal comparison.

G3 U4 Lesson 8

Compare unit fractions by using a number line

G3 U4 Lesson 8 - Students will compare unit fractions by using number lines

Warm Welcome (Slide 1): Tutor choice.

Frame the Learning/Connect to Prior Learning (Slide 2): In the last lesson, we compared fractions by understanding how the denominator tells us the size of pieces. We used pizza slices to help us picture it. We drew equal sized wholes to compare pieces. Today, we're going to use number lines to compare fractions. We're still looking at the size of our pieces. We're just using a number line to help us picture it today.

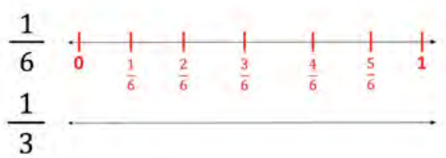
Let's Talk (Slide 3): This slide says, **Which is larger, ⅙ or ⅓? How do you know? If you don't know, how could you find out?** Possible Student Answers, Key Points:

- ⅓ is larger than ⅙ because ⅓ is only cut into 3 pieces, which means the pieces are cut less than sixths and so each piece will be larger than a sixth.
- ⅙ is smaller than ⅓ because it's cut into 6 parts, which is twice as many parts as ⅓, so the sizes are going to be half the size of a third.
- We could draw a model and compare the sizes!

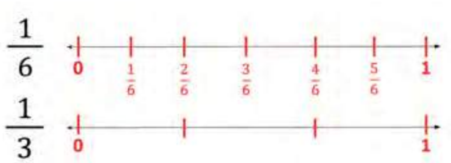
Some of you are thinking ⅓ is bigger, some of you aren't sure, and others think that make ⅙ is bigger. Let's use a number line to help us find out. Remember that creating a number line is not so different from drawing a bar model.

Let's Think (Slide 4): Notice even the number lines I draw are equal in length - in order to compare fractions, they **must** be equal sized wholes! Now, the first step is always to label our number line with 0 and 1.

Starting with ⅙, we divide a number line the same way we divide fraction strips. We see that 6 is the denominator so we'll split the number line into 6 parts. This can be hard so let's first divide it into 3 parts and then divide each third into two pieces to make sixths.

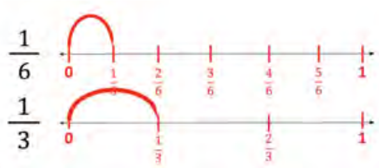


Now, we need to number each of our ticks. Count the fractions with me as I number them.



Now for ⅓, we need to split our whole into three equal-sized pieces.

Now, we number each of our ticks. Count the fractions with me as I number them… ⅓, ⅔.



Now, let's take a look at the size of our pieces. The numerator in both of our fractions is 1. So we want to see whether 1 out of 6 pieces is bigger or smaller than 1 out 3 pieces. Let's make a hop on our number line to see how much each piece is. Which is bigger? ⅓! That's right, ⅓ is greater or bigger than ⅙. We can clearly see that a third is a larger piece than a sixth.

Let's go back and read from left to right and fill in our symbol.

Nice work, did you see how comparing fractions on a number line was nearly the same as comparing fractions with models?

Let's Try it (Slides 5-6): As we work today, remember that our denominator tells us the **size** of our pieces. Take time when you're comparing fractions to think about the differences between the two denominators you're given. The greater the denominator, the more pieces our whole is divided into - which means the size of the pieces are smaller. Make an educated guess *before* you complete your number line to check your thinking. And make sure that your number lines need to be EQUAL sizes.

WARM WELCOME

Today we will compare unit fractions by using number lines.

Let's Talk:

Which is larger, $\frac{1}{6}$ or $\frac{1}{3}$?

How do you know? If you don't know, how could you find out?

Let's Think:

$\frac{1}{6}$

$\frac{1}{3}$

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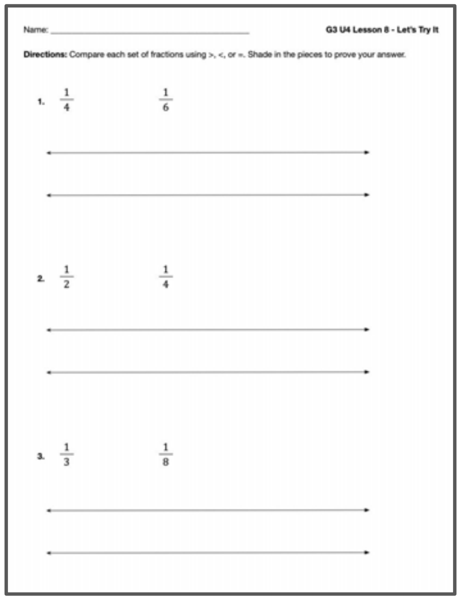
Let's Try It:



Name: ______________________ **G3 U4 Lesson 8 - Let's Try It**

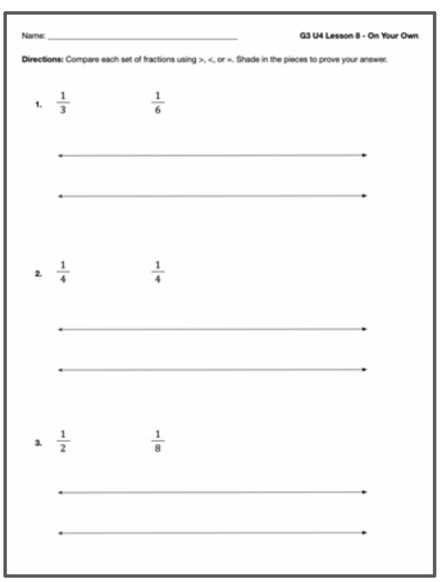
Directions: Compare each set of fractions using >, <, or =. Shade in the pieces to prove your answer.

1. $\frac{1}{4}$ $\frac{1}{6}$

2. $\frac{1}{2}$ $\frac{1}{4}$

3. $\frac{1}{3}$ $\frac{1}{8}$

On your Own:



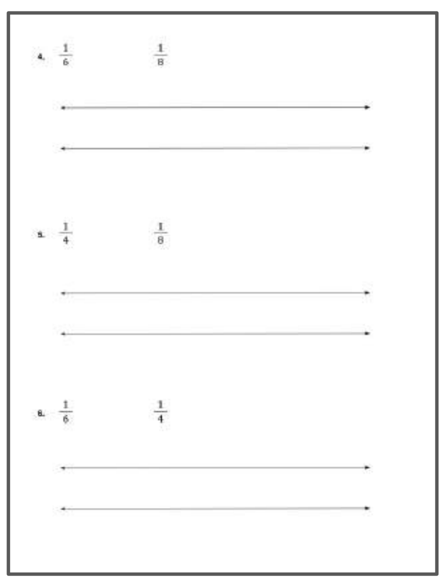
Name: ______________________ **G3 U4 Lesson 8 - On Your Own**

Directions: Compare each set of fractions using >, <, or =. Shade in the pieces to prove your answer.

1. $\frac{1}{3}$ $\frac{1}{6}$

2. $\frac{1}{4}$ $\frac{1}{4}$

3. $\frac{1}{2}$ $\frac{1}{8}$



4. $\frac{1}{6}$ $\frac{1}{8}$

5. $\frac{1}{4}$ $\frac{1}{8}$

6. $\frac{1}{6}$ $\frac{1}{4}$

Name: ____ G3 U4 Lesson 8 - Let’s Try It

Directions: Compare each set of fractions using >, <, or =. Draw hops to show the size of the pieces to prove your answer.

1. $\frac{1}{6}$ $\frac{1}{4}$

2. $\frac{1}{2}$ $\frac{1}{4}$

3. $\frac{1}{8}$ $\frac{1}{3}$

Name: ____ G3 U4 Lesson 8 - Independent Work

Directions: Compare each set of fractions using >, <, or =. Draw hops to show the size of the pieces to prove your answer.

1. $\frac{1}{3}$ $\frac{1}{6}$

2. $\frac{1}{4}$ $\frac{1}{4}$

3. $\frac{1}{8}$ $\frac{1}{2}$

4. $\frac{1}{6}$ $\frac{1}{8}$

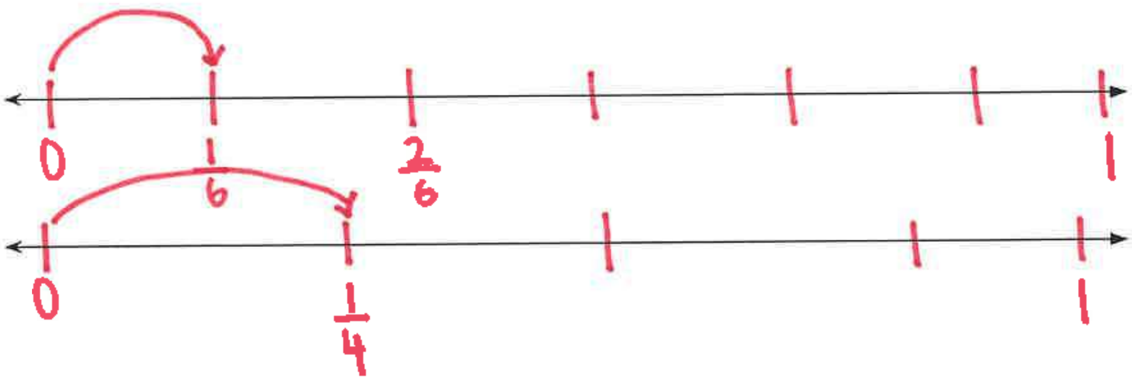
5. $\frac{1}{8}$ $\frac{1}{3}$

6. $\frac{1}{6}$ $\frac{1}{4}$

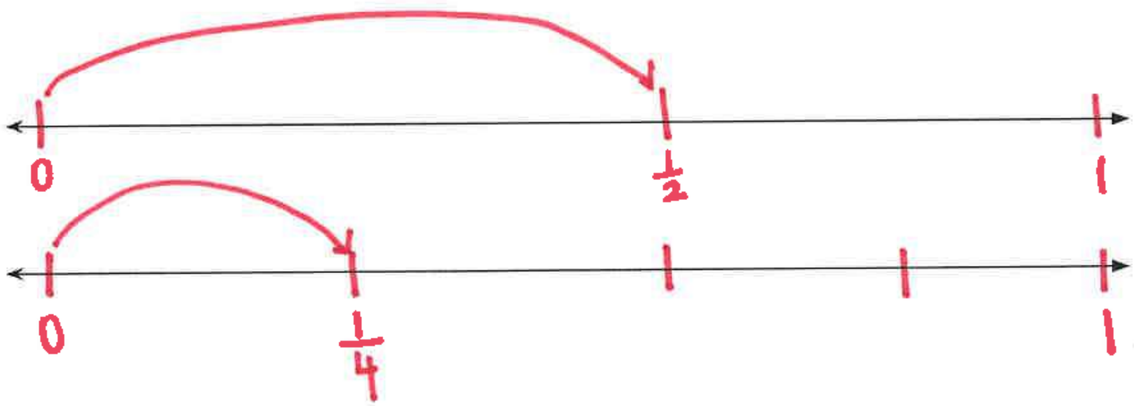
Name: ANSWER KEY

Directions: Compare each set of fractions using >, <, or =. Draw hops to show the size of the pieces to prove your answer.

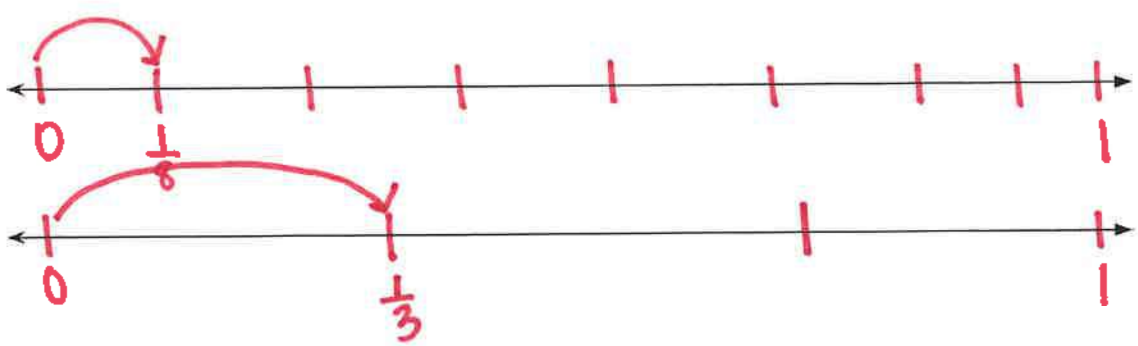
1. $\frac{1}{6}$ $<$ $\frac{1}{4}$



2. $\frac{1}{2}$ $>$ $\frac{1}{4}$



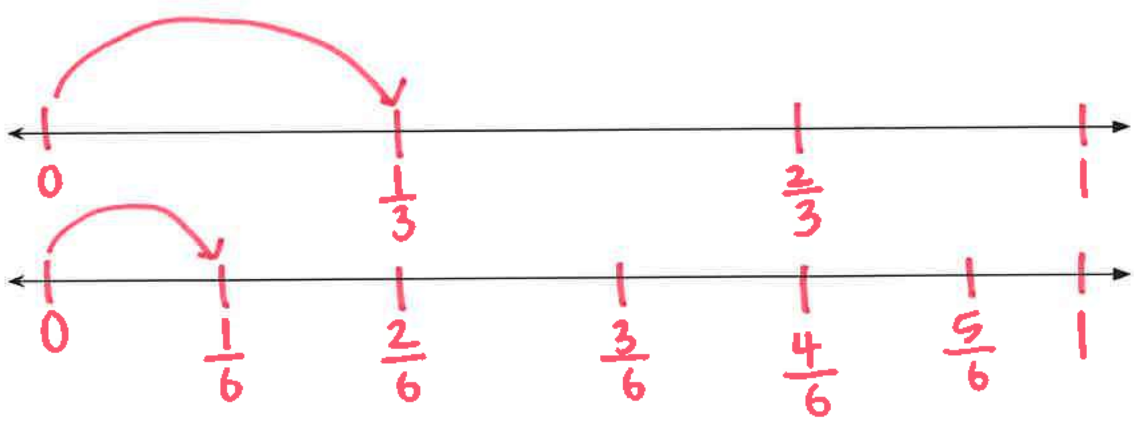
3. $\frac{1}{8}$ $<$ $\frac{1}{3}$



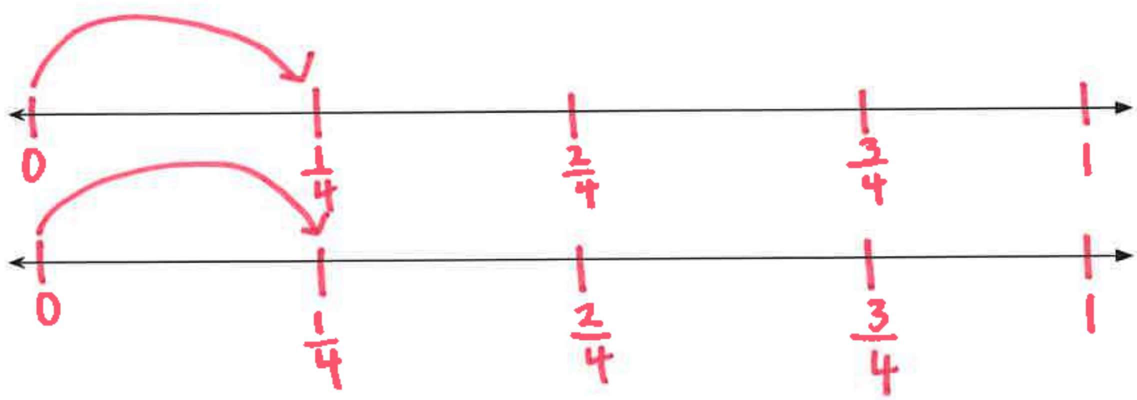
Name: ANSWER KEY

Directions: Compare each set of fractions using >, <, or =. Draw hops to show the size of the pieces to prove your answer.

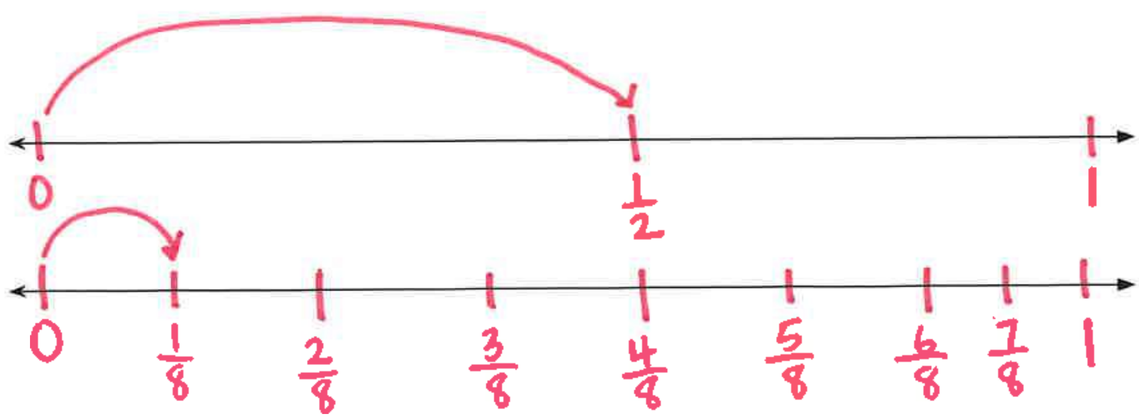
1. $\frac{1}{3}$ > $\frac{1}{6}$



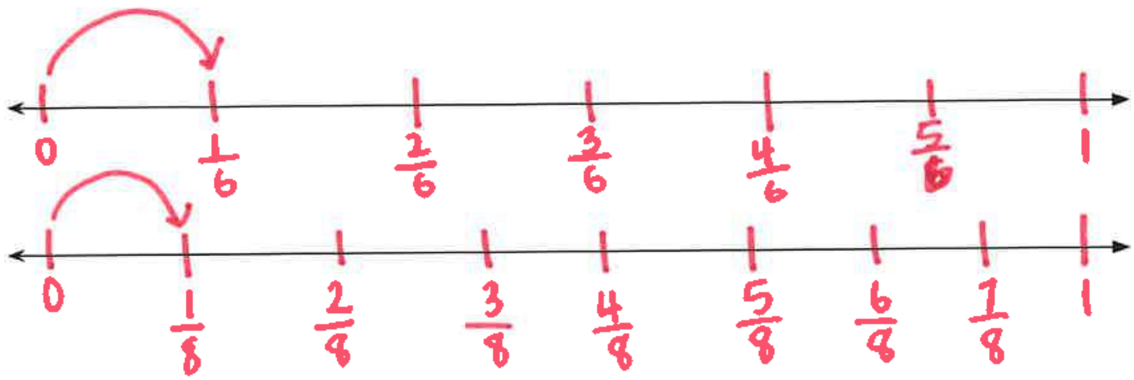
2. $\frac{1}{4}$ = $\frac{1}{4}$



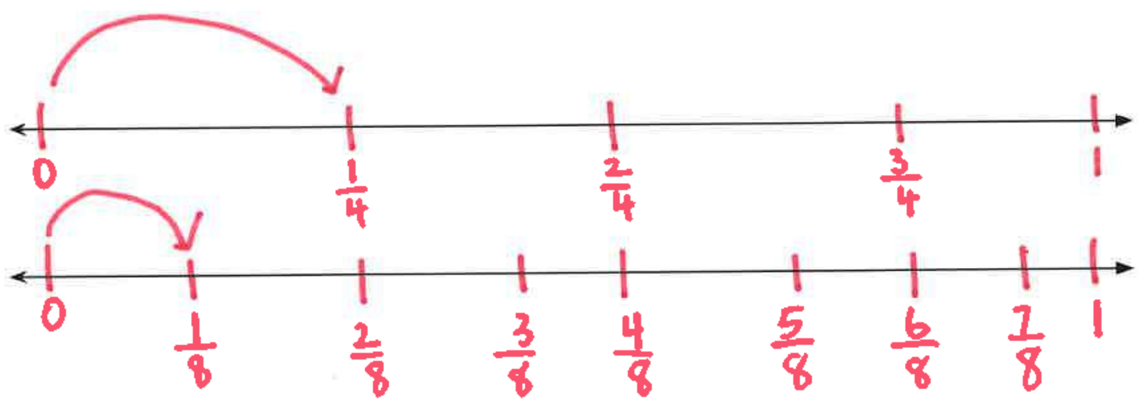
3. $\frac{1}{2}$ > $\frac{1}{8}$



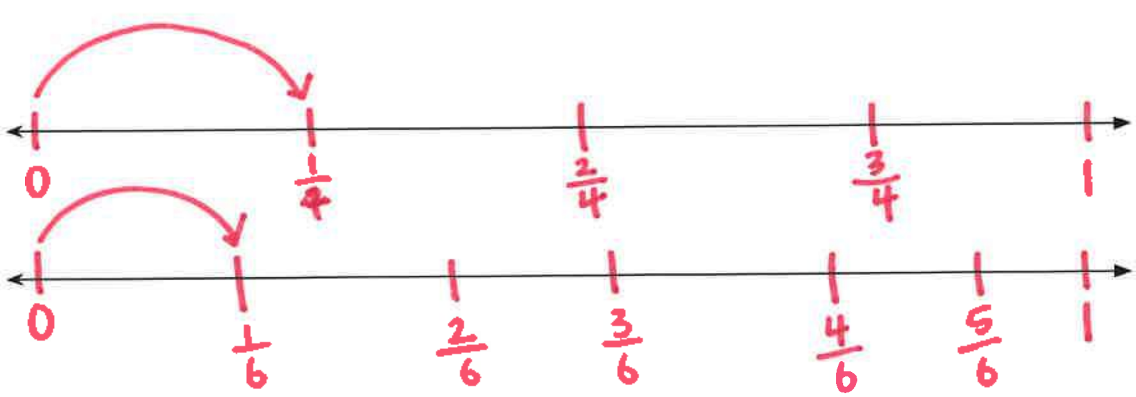
4. $\frac{1}{6} > \frac{1}{8}$



5. $\frac{1}{4} > \frac{1}{8}$



6. $\frac{1}{6} < \frac{1}{4}$



G3 U4 Lesson 9

Compare fractions with like numerators

CITYTUTOR DC

G3 U4 Lesson 9 - Students will compare fractions with like numerators

Warm Welcome (Slide 1): Tutor choice.

Frame the Learning/Connect to Prior Learning (Slide 2): In the last couple of lessons, we compared unit fractions, where the numerator is one, like ⅓ to ⅛. In all of these comparisons, we were comparing **one** piece in a whole to a different sized piece in a whole. Today, we're going to step it up a notch and compare fractions of *more than one* part or piece.

Let's Talk (Slide 3): On this slide, we're looking at $\frac{2}{3}$ and $\frac{2}{8}$. **How could we use what we know to compare the two fractions?** Possible Student Answers, Key Points:

- *$\frac{2}{3}$ is larger than $\frac{2}{8}$ because $\frac{2}{3}$ is only cut into 3 pieces, so the pieces are larger sizes than eighths.*
- *We're comparing the same number of pieces. If $\frac{1}{3}$ is greater than $\frac{1}{8}$, we know $\frac{2}{3}$ is greater than $\frac{2}{8}$.*
- *$\frac{1}{6}$ is smaller than $\frac{1}{3}$ because it's cut into 6 parts, it's twice as many parts as $\frac{1}{3}$, so the sizes are half the size of a third.*

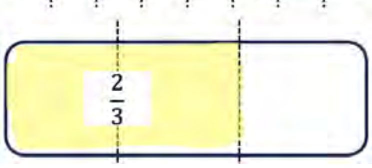
Those are interesting ideas! We can use what we know about comparing UNIT fractions, with just ONE piece to compare other fractions. These are similar because they both have the same number of pieces, which is two.

Let's Talk (Slide 4): We're going to test your hypothesis on this slide! We've learned that we can use number lines or fraction models to help us compare. Let's draw some fraction models. We can use circles or rectangles, I prefer rectangles because they're a little easier to split. I'm going to make sure that the whole wholes that I draw are the exact same side.

Let's start by splitting our wholes into pieces. The first fraction says two eighths. We know that the denominator tells us how many pieces are in one whole. So what should I cut the top whole into? Eight pieces!

And, what should we cut our bottom whole into? Three pieces! That's right, we see that the denominator is three so we could cut it into three equal-sized pieces.

Now, let's shade in and label what we're comparing. We're comparing two eighths, so two out of eight pieces, let me shade those in and label them.



And we're comparing two eights to two thirds, that means two out of three pieces. Let's shade them in and label them.

The model helps me compare! I see that $\frac{2}{8}$ is less than, or smaller than, $\frac{2}{3}$. And you're exactly right that knowing how to compare UNIT fractions can help us compare non-unit fractions. Here, we're comparing fractions that have the same numerator, the same number of pieces, it's pretty similar to comparing unit fractions since unit fractions have the same numerator as well…one!

Let's Try it (Slides 7): You all are such thoughtful mathematicians. Make sure you continue to be thoughtful as you compare fractions with the same numerators. Remember that if they both have the same numerator, then you're using the denominator to compare the fractions. Our denominator tells us the **size** of our pieces. Make an educated guess *before* you draw your number line or fraction strip to prove the comparison. Then, use your drawing to check your thinking!

WARM WELCOME

Today we will compare fractions with like numerators.

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Let's Talk:

How can we use what we know to compare these fractions?

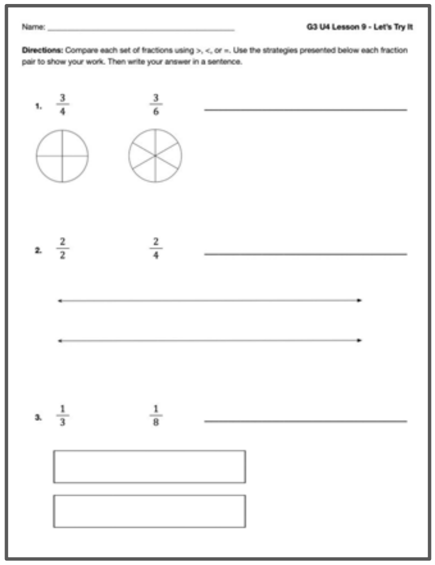
$$\frac{2}{3} \qquad \frac{2}{8}$$

Let's Talk:

Let's compare these fractions.

$$\frac{2}{3} \qquad \frac{2}{8}$$

Let's Try It:


Name: ______________________ G3 U4 Lesson 9 - Let's Try It

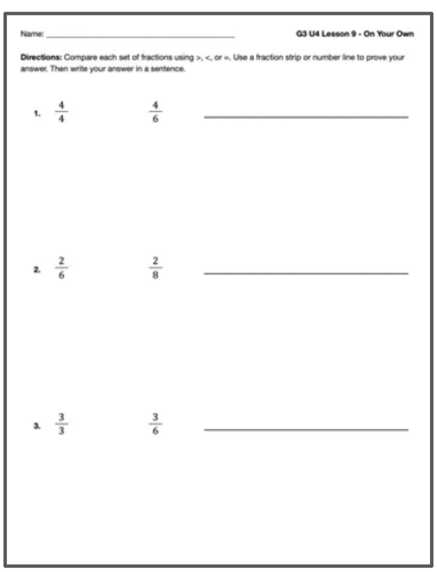
Directions: Compare each set of fractions using >, <, or =. Use the strategies presented below each fraction pair to show your work. Then write your answer in a sentence.

1. $\frac{3}{4}$ $\frac{3}{6}$ ______________________

2. $\frac{2}{2}$ $\frac{2}{4}$ ______________________

3. $\frac{1}{3}$ $\frac{1}{8}$ ______________________

On your Own:

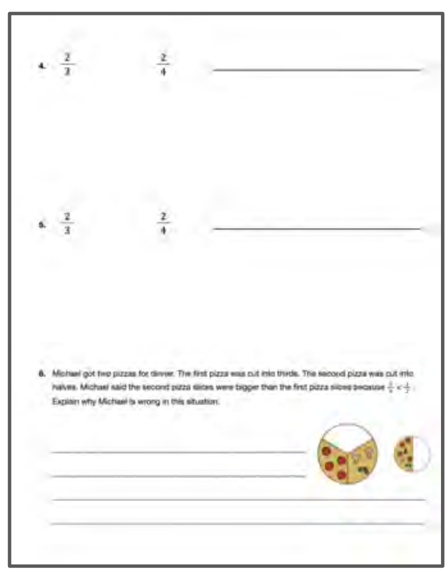

Name: ______________________ G3 U4 Lesson 9 - On Your Own

Directions: Compare each set of fractions using >, <, or =. Use a fraction strip or number line to prove your answer. Then write your answer in a sentence.

1. $\frac{4}{4}$ $\frac{4}{6}$ ______________________

2. $\frac{2}{6}$ $\frac{2}{8}$ ______________________

3. $\frac{3}{3}$ $\frac{3}{6}$ ______________________

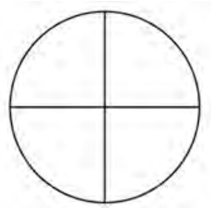

4. $\frac{2}{3}$ $\frac{2}{4}$ ______________________

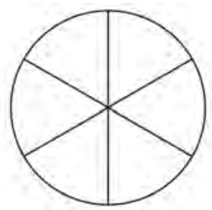
5. $\frac{2}{3}$ $\frac{2}{4}$ ______________________

6. Michael got two pizzas for dinner. The first pizza was cut into thirds. The second pizza was cut into halves. Michael said the second pizza slices were bigger than the first pizza slices because $\frac{1}{3} < \frac{1}{2}$. Explain why Michael is wrong in this situation.

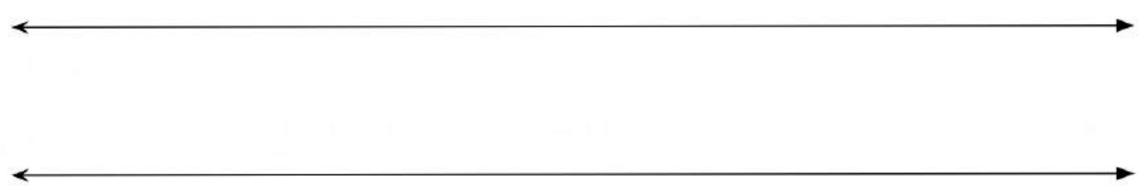
Directions: Compare each set of fractions using >, <, or =. Use the strategies presented below each fraction pair to show your work. Then write your answer in a sentence.

1. $\frac{3}{4}$ $\frac{3}{6}$ ______________________________

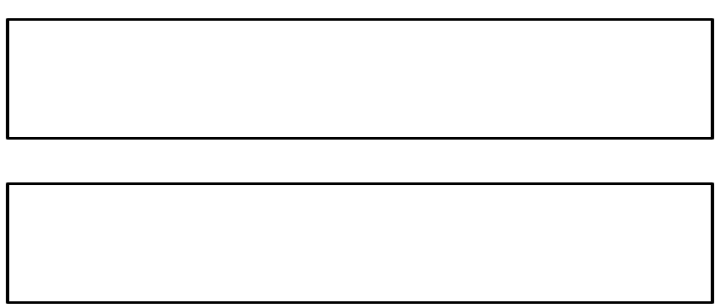




2. $\frac{2}{2}$ $\frac{2}{4}$ ______________________________



3. $\frac{1}{3}$ $\frac{1}{8}$ ______________________________



Directions: Compare each set of fractions using >, <, or =. Use a fraction strip or number line to prove your answer. Then write your answer in a sentence.

1. $\frac{4}{4}$ $\frac{4}{6}$ ______________________________

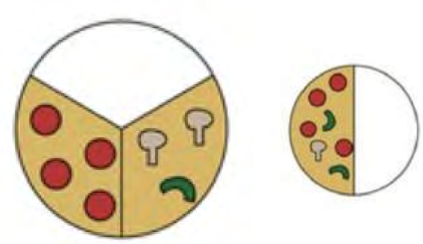
2. $\frac{2}{8}$ $\frac{2}{6}$ ______________________________

3. $\frac{3}{6}$ $\frac{3}{3}$ ______________________________

4. $\frac{2}{3}$ $\frac{2}{4}$ ______________________________

5. $\frac{2}{8}$ $\frac{2}{4}$ ______________________________

6. Michael got two pizzas for dinner. The first pizza was cut into thirds. The second pizza was cut into halves. Michael said the second pizza slices were bigger than the first pizza slices because $\frac{1}{3} < \frac{1}{2}$. Explain why Michael is wrong in this situation.



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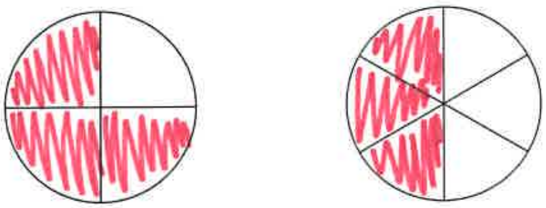
Name: ANSWER KEY

Directions: Compare each set of fractions using >, <, or =. Use the strategies presented below each fraction pair to show your work. Then write your answer in a sentence.

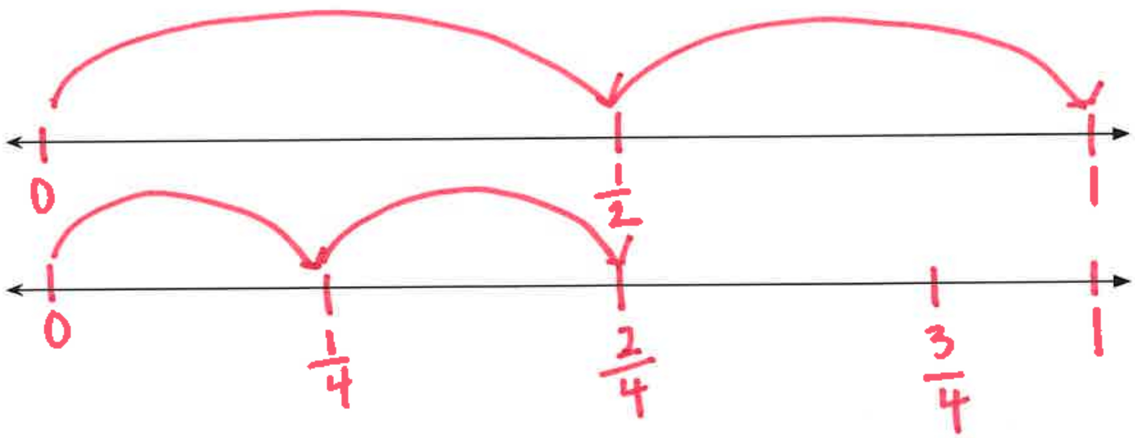
1. $\frac{3}{4}$ > $\frac{3}{6}$

$\frac{3}{4}$ is greater than $\frac{3}{6}$.



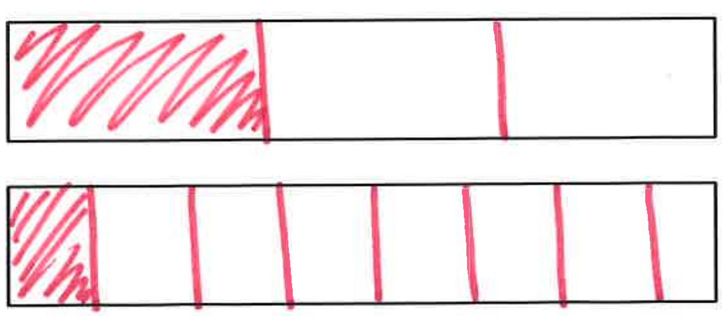
2. $\frac{2}{2}$ > $\frac{2}{4}$

$\frac{2}{2}$ is greater than $\frac{2}{4}$.



3. $\frac{1}{3}$ > $\frac{1}{8}$

$\frac{1}{3}$ is greater than $\frac{1}{8}$.



Name: ANSWER KEY

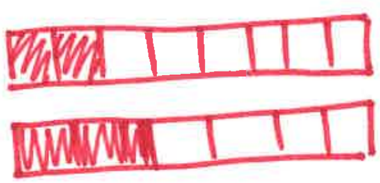
Directions: Compare each set of fractions using >, <, or =. Use a fraction strip or number line to prove your answer. Then write your answer in a sentence.

1. $\frac{4}{4}$ > $\frac{4}{6}$

$\frac{4}{4}$ is greater than $\frac{4}{6}$

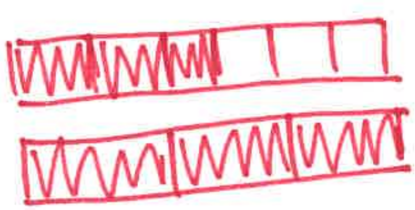
2. $\frac{2}{8}$ < $\frac{2}{6}$

$\frac{2}{8}$ is less than $\frac{2}{6}$

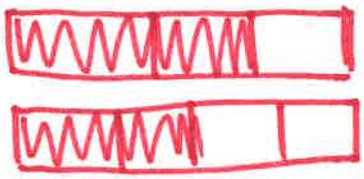


3. $\frac{3}{6}$ < $\frac{3}{3}$

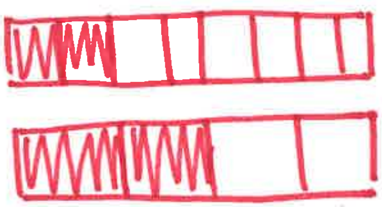
$\frac{3}{6}$ is less than $\frac{3}{3}$



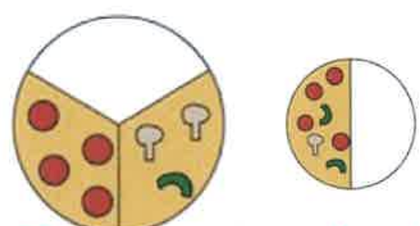
4. $\frac{2}{3}$ > $\frac{2}{4}$ $\frac{2}{3}$ is greater than $\frac{2}{4}$



5. $\frac{2}{8}$ < $\frac{2}{4}$ $\frac{2}{8}$ is less than $\frac{2}{4}$



6. Michael got two pizzas for dinner. The first pizza was cut into thirds. The second pizza was cut into halves. Michael said the second pizza slices were bigger than the first pizza slices because $\frac{1}{3} < \frac{1}{2}$. Explain why Michael is wrong in this situation.



Michael is wrong because the two pizzas are not the same size wholes, so you can't compare them. The first pizza's slices will always be bigger than the second pizza because it's a larger whole!

G3 U4 Lesson 10

Compare fractions with like denominators

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G3 U4 Lesson 10 - Students will compare fractions with like denominators

Warm Welcome (Slide 1): Tutor choice.

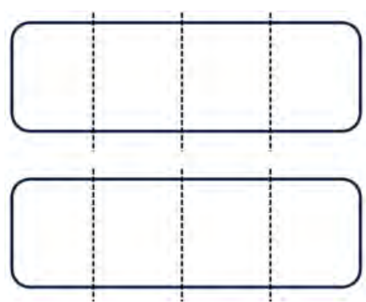
Frame the Learning/Connect to Prior Learning (Slide 2): In the last lesson, we compared fractions with like numerators - the number of pieces were the same, but the size of the pieces were different. Today, we're going to be doing the opposite! We're comparing fractions with like *denominators* but different numerators!

Let's Talk (Slide 3): Looking at this comparison, **how is it different from comparing like numerators? What should we be thinking about differently?** Possible Student Answers, Key Points:

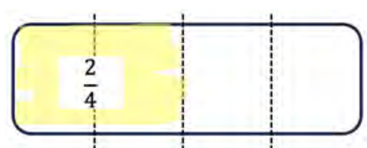
- If the denominators are both the same, then the size of our pieces are all the same
- We don't need to compare the size of the pieces, we just need to compare the numerators - the number of pieces we have.

Those are interesting ideas! Let's draw some models to compare these two fractions.

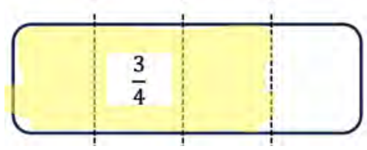
Let's Talk (Slide 4): Let's shade in our pieces and see if our thinking is correct! Just like we've been doing, we're going to make sure that we draw two wholes that are the exact same size.



Now, you all mentioned that since the denominators are the same, the size of the pieces are the same. We're comparing $\frac{2}{4}$ to $\frac{3}{4}$. So, we're comparing fourths. Let's split both wholes into fourths, that's easy!



And, let's shade the top one. How many pieces should we shade in? 2!



Now let's shade the bottom one. How many pieces should we shade in? 3!

So, we're comparing 2 out of 4 pieces to 3 out of 4 pieces. If I only have 2 pieces, I have less than if I had 3 of the same sized pieces. So, $\frac{2}{4}$ *is less than* $\frac{3}{4}$.

So, when we're comparing fractions with *common denominators*, we're not comparing the size of the pieces because they're all the same. Instead, we're going to focus on the *numerators* - how many pieces are shaded in or how many pieces we have!

Let's Think (Slide 5): Before we draw a model to compare these fractions, **what are you noticing and wondering about these two fractions? What ideas do you have to compare them…** Possible Student Answers, Key Points:

- They both have the same numerator and denominator.
- 2 out of 2 is 1 whole, 5 out of 5 is 1 whole.
- I think they're the same because they're both equal to 1 whole.
- I wonder if 5 fifths is bigger because 5 is bigger than 2.
- The fractions have like numerators AND like denominators.

Those are all interesting ideas! Raise your hand if you think $\frac{5}{5}$ is bigger, raise your hand if you think $\frac{2}{2}$ is bigger, raise your hand if you think they're the same! Let's draw a quick picture to explore.

- Everyone draw 2 wholes that are the exact same size.
- Now, how many should we cut the top one into? 5! Go ahead.
- And, how many should we cut the bottom one into? 2! Go ahead.
- Now let's shade, go back to your fractions and shade in 5 fifths and 2 halves.
- Now we're ready to compare. Which is bigger? Neither!

That's right, they're the same! 5 fifths and 2 halves are equal to each other. 2 out of 2 pieces and 5 out of 5 pieces are the same because they both make 1 whole!

Let's Try it (Slides 6-7): So, as you work today, remember to look at the full fraction - denominator and numerator to figure out what you're actually comparing. Make an educated guess on which fraction is greater. Then, prove it with your drawing!

WARM WELCOME

Today we will compare fractions with like denominators.

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Let's Talk:

$$\frac{2}{4} \qquad \frac{3}{4}$$

Let's Think:

Let's draw a model to compare these fractions.

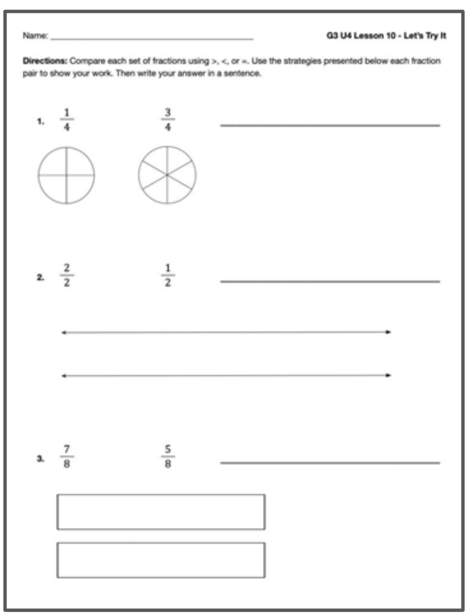
$$\frac{2}{4} \qquad \frac{3}{4}$$

Let's Think:

How can we compare these two fractions?

$$\frac{5}{5} \qquad \frac{2}{2}$$

Let's Try It:



Name: ______________________ **G3 U4 Lesson 10 - Let's Try It**

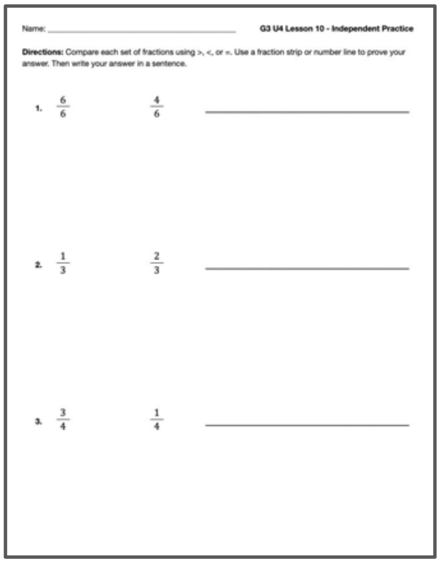
Directions: Compare each set of fractions using >, <, or =. Use the strategies presented below each fraction pair to show your work. Then write your answer in a sentence.

1. $\frac{1}{4}$ $\frac{3}{4}$ ______________________

2. $\frac{2}{2}$ $\frac{1}{2}$ ______________________

3. $\frac{7}{8}$ $\frac{5}{8}$ ______________________

On your Own:

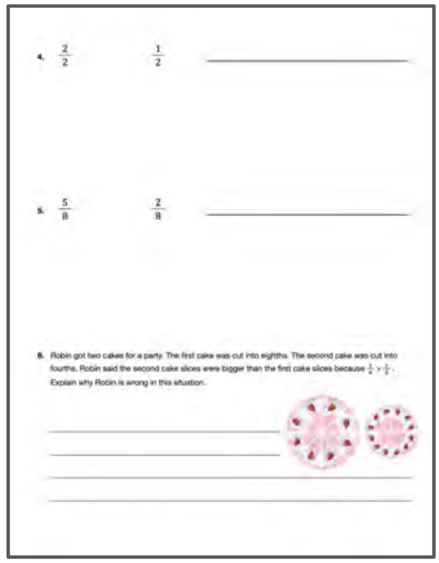

Name: ______________________ **G3 U4 Lesson 10 - Independent Practice**

Directions: Compare each set of fractions using >, <, or =. Use a fraction strip or number line to prove your answer. Then write your answer in a sentence.

1. $\frac{6}{6}$ $\qquad$ $\frac{4}{6}$ ______________________

2. $\frac{1}{3}$ $\qquad$ $\frac{2}{3}$ ______________________

3. $\frac{3}{4}$ $\qquad$ $\frac{1}{4}$ ______________________


4. $\frac{2}{2}$ $\qquad$ $\frac{1}{2}$ ______________________

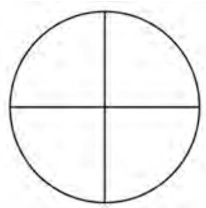
5. $\frac{5}{8}$ $\qquad$ $\frac{2}{8}$ ______________________

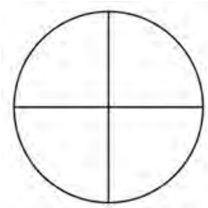
6. Robin got two cakes for a party. The first cake was cut into eighths. The second cake was cut into fourths. Robin said the second cake slices were bigger than the first cake slices because [illegible]. Explain why Robin is wrong in this situation.

Name: ____

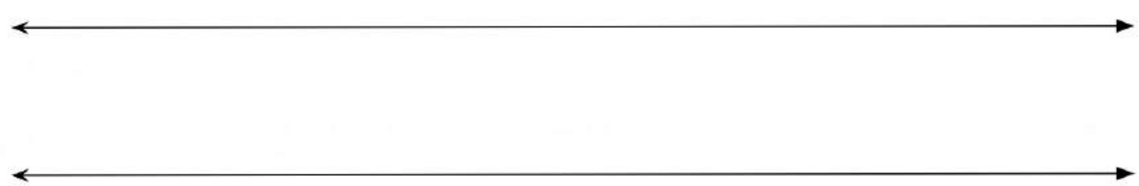
Directions: Compare each set of fractions using >, <, or =. Use the strategies presented below each fraction pair to show your work. Then write your answer in a sentence.

1. $\frac{1}{4}$ $\frac{3}{4}$ ____

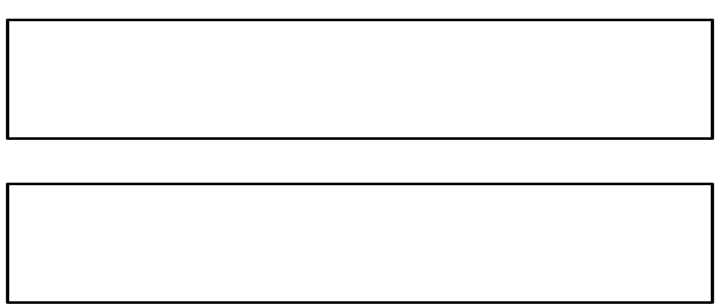




2. $\frac{2}{2}$ $\frac{1}{2}$ ____



3. $\frac{7}{8}$ $\frac{5}{8}$ ____



Name: ____ **G3 U4 Lesson 10 - Independent Work**

Directions: Compare each set of fractions using >, <, or =. Use a fraction strip or number line to prove your answer. Then write your answer in a sentence.

1. $\frac{6}{6}$ $\frac{4}{6}$ ____

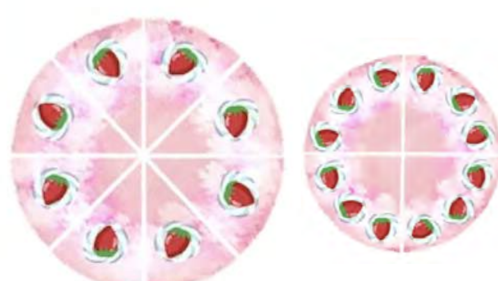
2. $\frac{1}{3}$ $\frac{2}{3}$ ____

3. $\frac{3}{4}$ $\frac{1}{4}$ ____

4. $\frac{2}{2}$ $\frac{1}{2}$ ______________________

5. $\frac{5}{8}$ $\frac{2}{8}$ ______________________

6. Robin got two cakes for a party. The first cake was cut into eighths. The second cake was cut into fourths. Robin said the second cake slices were bigger than the first cake slices because $\frac{1}{4} > \frac{1}{8}$. Explain why Robin is wrong in this situation.



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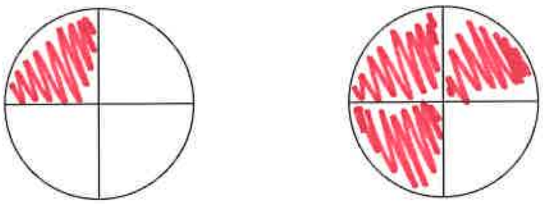
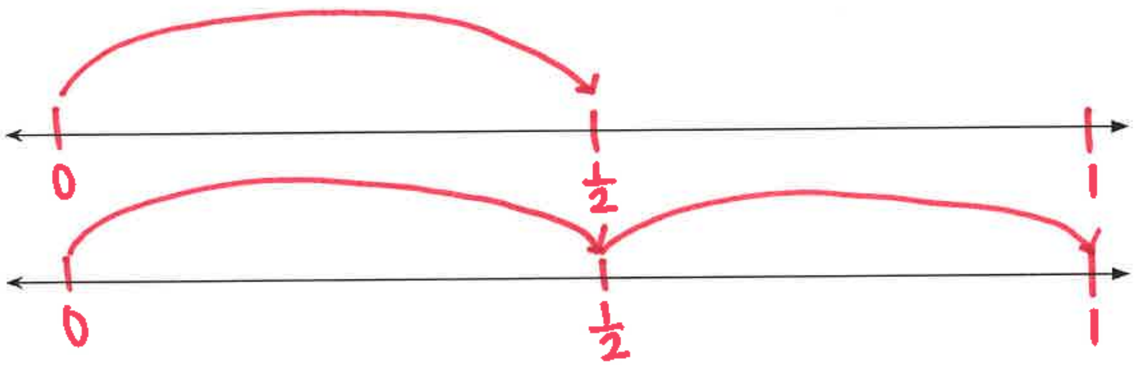
Name: ANSWER KEY

Directions: Compare each set of fractions using >, <, or =. Use the strategies presented below each fraction pair to show your work. Then write your answer in a sentence.

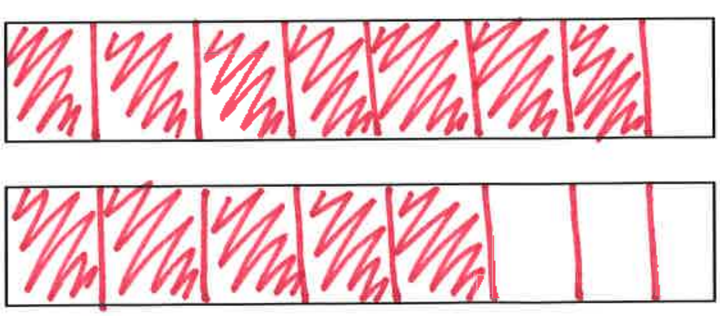
1. $\frac{1}{4}$ < $\frac{3}{4}$ $\frac{1}{4}$ is less than $\frac{3}{4}$.



2. $\frac{2}{2}$ > $\frac{1}{2}$ $\frac{2}{2}$ is greater than $\frac{1}{2}$.



3. $\frac{7}{8}$ > $\frac{5}{8}$ $\frac{7}{8}$ is greater than $\frac{5}{8}$.

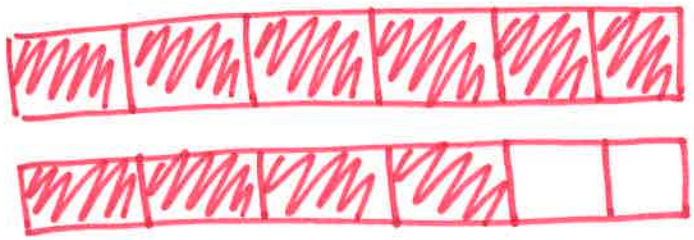


Name: ANSWER KEY

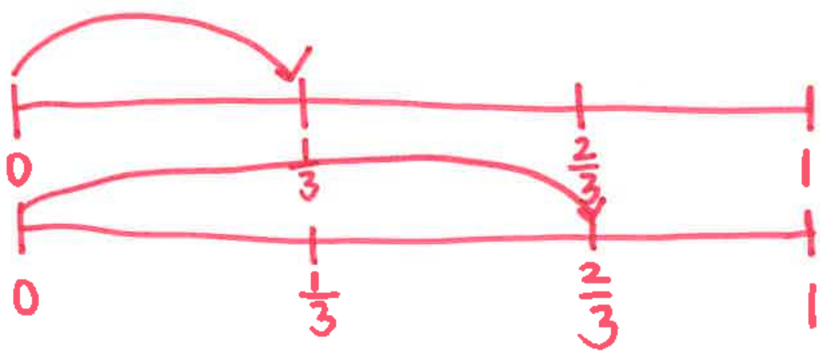
Directions: Compare each set of fractions using >, <, or =. Use a fraction strip or number line to prove your answer. Then write your answer in a sentence.

Student work will vary.

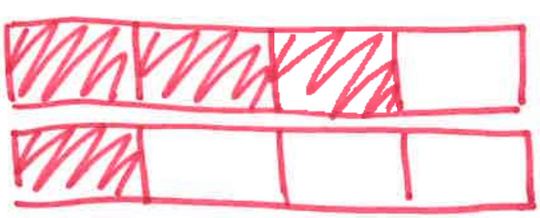
1. $\frac{6}{6}$ $>$ $\frac{4}{6}$ $\frac{6}{6}$ is greater than $\frac{4}{6}$.



2. $\frac{1}{3}$ $<$ $\frac{2}{3}$ $\frac{1}{3}$ is less than $\frac{2}{3}$.

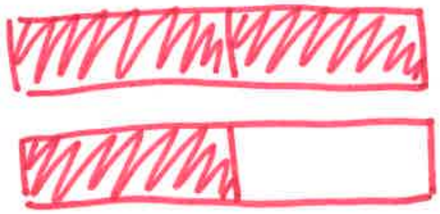


3. $\frac{3}{4}$ $>$ $\frac{1}{4}$ $\frac{3}{4}$ is greater than $\frac{1}{4}$.



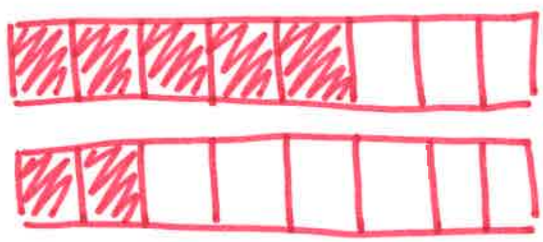
4. $\frac{2}{2}$ > $\frac{1}{2}$

$\frac{2}{2}$ is greater than $\frac{1}{2}$.

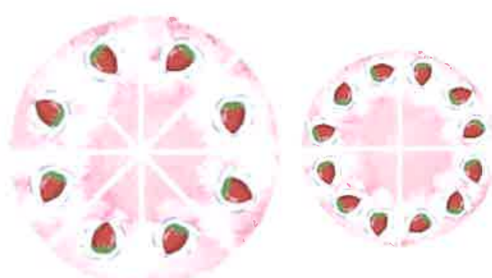


5. $\frac{5}{8}$ > $\frac{2}{8}$

$\frac{5}{8}$ is greater than $\frac{2}{8}$.



6. Robin got two cakes for a party. The first cake was cut into eighths. The second cake was cut into fourths. Robin said the second cake slices were bigger than the first cake slices because $\frac{1}{4} > \frac{1}{8}$. Explain why Robin is wrong in this situation.



Robin is wrong because the cakes are not equal wholes, so the size of each slice can't be compared. The larger cake will automatically have larger size pieces.

G3 U4 Lesson 11

Use models to find equivalent fractions

G3 U4 Lesson 11 - Students will use models to find equivalent fractions

Materials:
- Fraction tiles for every student (optional)

Warm Welcome (Slide 1): Tutor choice.

Frame the Learning/Connect to Prior Learning (Slide 2): In the last few lessons, we compared fractions to see whether one fraction was bigger or smaller than another fraction. But what about when fractions are equivalent? equivalent means the same as, or equal. We started to explore this yesterday when we looked at $\frac{2}{2}$ and $\frac{5}{5}$. We realized they were the same, or equivalent, because they both were the same as 1 whole. Today we're going to explore whether fractions with different numbers in their numerator and denominator can be equivalent.

Let's Talk (Slide 3): We have three bars here - what do you notice about the bars? Possible Student Answers, Key Points:
- One bar is just one whole - it isn't cut at all and one bar is cut into halves - it's just in two pieces, and the last bar is cut into fourths - it's in four pieces
- They're all the same size whole but cut into different sizes
- They show us the size of each part of the whole and we can see a few places where the lines match up!
- They look like our fraction models that we've been drawing!

Interesting! You all are making connections to the fraction models that we have been drawing over the last few lessons.

Let's Talk (Slide 4): Now I want you to look closely at $\frac{1}{2}$ and $\frac{2}{4}$, what relationship do you notice? Possible Student Answers, Key Points:
- They're the same size pieces
- Two of the fourths make up one of the halves
- They stop at the same spot, they are the same size.

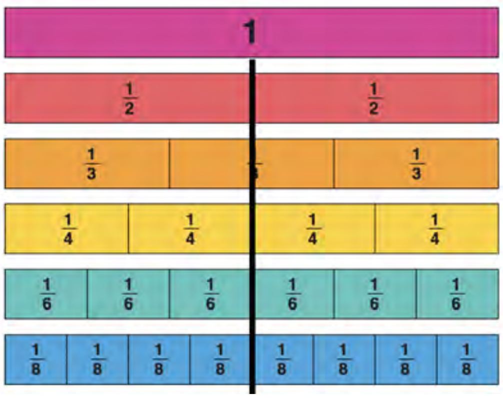
Note: *If students do not come up with answers on their own, tell them the key points and outline the equivalency on the slide - to show them how* $\frac{1}{2} = \frac{2}{4}$

Look, $\frac{1}{2}$ and $\frac{2}{4}$ take up the same amount of space! They're the exact same size. I can tell they're the same because the line where they are cut matches up perfectly! That tells me that they are **equivalent.** I can show this equivalency by writing $\frac{1}{2} = \frac{2}{4}$ because even though the digits in the fraction are different, the size of the pieces are exactly the same!

Do you notice that when we make fourths or eighths with our fraction strips, we always start with halves? Why do you think that is? **Possible Student Answers, Key Points:**
- *It's because two is half of four and four is half of eight.*
- *If you add two and two together, you get four! If you add four and four together, you get eight!*
- *Two groups of two (2 x 2) makes 4 and two groups of 4 (2 x 4) makes 8*

That's right! And that's the same reason why $\frac{1}{2} = \frac{2}{4}$. There are **two** groups of $\frac{1}{4}$ in **one** group of a half because 2 is half of four and 1 is half of 2! They're all equal to one half! Another way to think about it is, when we cut fourths, we always start with $\frac{1}{2}$ and to make fourths we take one piece of a half and cut it into two more pieces to make fourths. That's why $\frac{1}{2} = \frac{2}{4}$. There are two fourths in **one** half.

Let's Think (Slide 5): Here are a few more fraction strips, let's see if we notice any other relationships between fractions. (*Give students time to share*).



So, let's see if we can find other fractions that are equivalent to one half. Let's drag a line down from ½ to make it easier to see. Oh, now I can easily find some fractions that are equivalent to one half.

For example, how many eighths are equal to one half? 4 eighths!

And, how many sixths are equal to one half? 3 sixths!

So, $\frac{3}{6}$ and $\frac{4}{8}$ and $\frac{2}{4}$ are equivalent to one half. Why does that make sense? Possible Student Answers, Key Points:

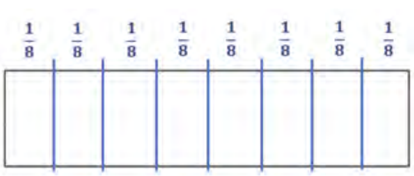
- When we're making eighths, we always start with one-half first. Then we cut a half into two pieces and then again into two pieces to make eighths. So there are 4 eighths in one half.
- Well, 4 is half of 8 and 3 is half of 6 and 1 is half of 2 so they're all equal to one half.

Do you see anywhere else in these fraction strips where a number of fraction pieces equals another fraction piece? Remember you're looking to see where the fraction strip cuts match up with another cut because equivalences mean the size of the pieces are the same - they take up the same amount of space! Possible Student Answers, Key Points:

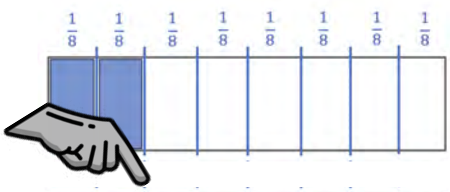
- I see that $\frac{2}{2}$ (or any total fraction with all of its pieces) is equal to 1 whole!
- I see that $\frac{1}{3}$ is equal to $\frac{2}{6}$!
- I see that $\frac{1}{2}$ is equal to any other fraction that is half of the whole!

But, we won't always have these bars to help us find equivalent fractions, what if I don't have these easy to read bars to see what's equivalent? What can I do then to find equivalent fractions?

Let's Think (Slide 6): We can draw our own! This equivalency is missing the **numerator** for fourths. We're trying to make it equal to $\frac{2}{8}$. That means it's asking us to figure out how many fourths are equivalent to $\frac{2}{8}$. Let's draw it out and see!

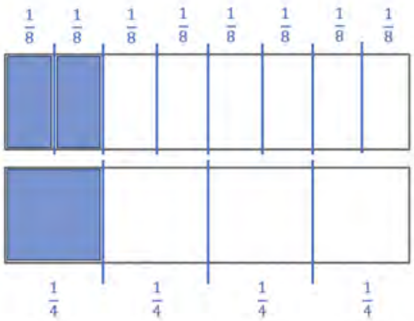


I'll start with my eighths first, since that's the first fraction and I know both the numerator and denominator for it. (*Make sure to split the eighths starting with a half - split the halves into fourths and then the fourths into eighths. Be deliberate about it so students see the process of how eighths are made from halves and fourths*)



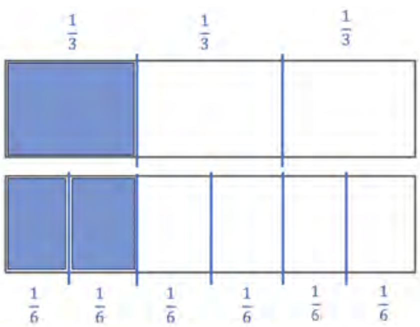
I’m going to shade in two pieces because the fraction is $\frac{2}{8}$.

Now, I’m going to draw fourths. Hmm, how many fourths will match up with $\frac{2}{8}$? Let’s look for where the cuts meet up!



That’s right! $\frac{1}{4}$ is the **same size** as $\frac{2}{8}$! They both take up the same amount of space, even though they have different numerators and denominators! And that makes sense because 4 is *half* of 8! We have to make fourths before we can make eighths. That means that $\frac{2}{8} = \frac{1}{4}$, so I would write in **1** as my missing numerator!

Let’s Think (Slide 7): Now let’s look at another one. We want to know how many sixths are equivalent to ⅓.



Okay, so, we’re trying to figure out how many sixths are in ⅓.

Everyone try it on your whiteboards and then we’ll work together to draw a picture to prove it.

According to your work, how many sixths are in ⅓? 2 sixths!

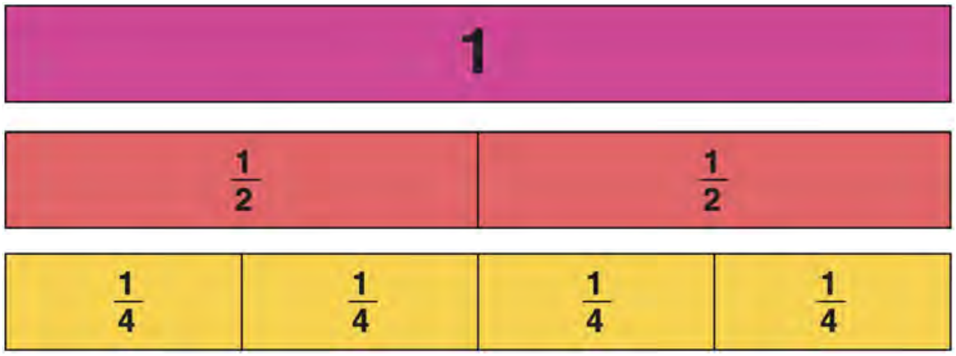
Let’s Try it (Slides 8-9): So, as you work today, remember that fractions are equivalent when they are the same size and **take up the same amount of space**. You can figure out if they’re equivalent by drawing equal sized wholes and cutting them according to the denominator - but then make sure you’re looking at the numerator to see how many pieces you’re comparing!

Note: For the Independent Practice, students can use the printable fraction tiles and use a piece of paper or a pen to find the equivalencies on the fraction strips provided. They should be starting from the left so they can see the number of fraction pieces that are equivalent.

WARM WELCOME

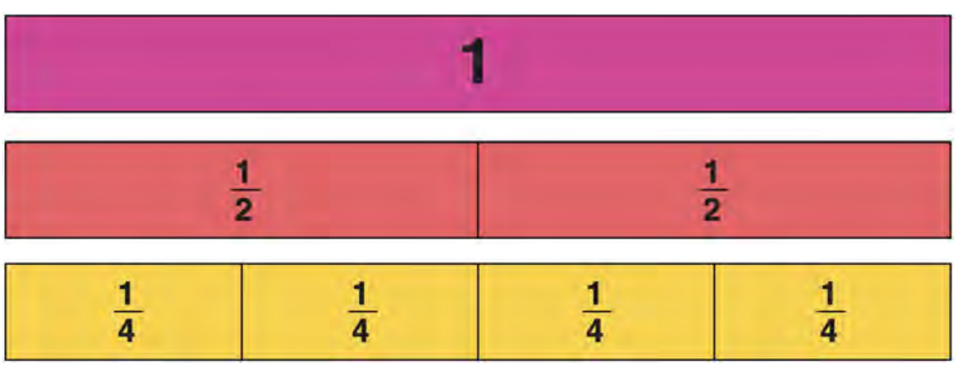
Today we will use models to find equivalent fractions.

Let's Talk:



Let's Talk:

What relationship do you notice between $\frac{1}{2}$ and $\frac{2}{4}$?



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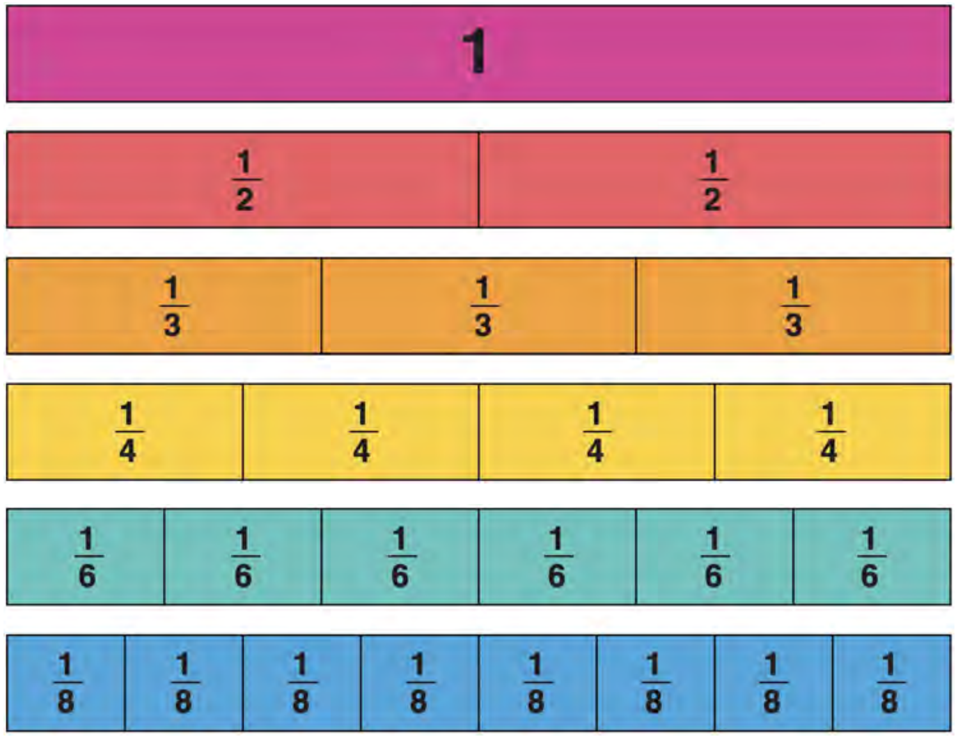
Let's Talk:

What other relationships do you notice between the fraction strips?



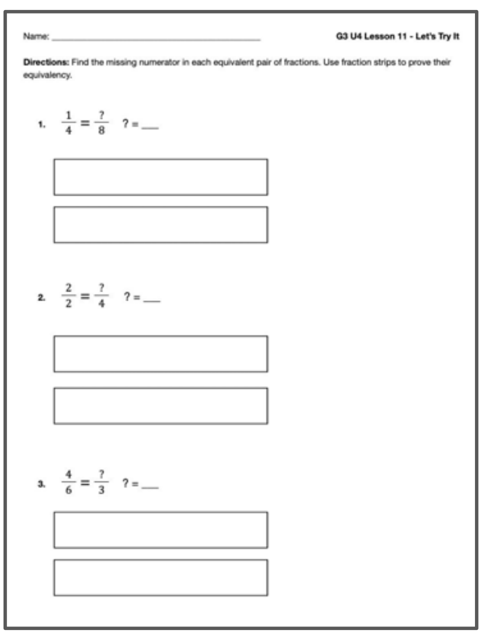
Let's Think:

$$\frac{2}{8} = \frac{?}{4}$$

Let's Think:

$$\frac{1}{3} = \frac{?}{6}$$

Let's Try It:



Name: ______________________ **G3 U4 Lesson 11 - Let's Try It**

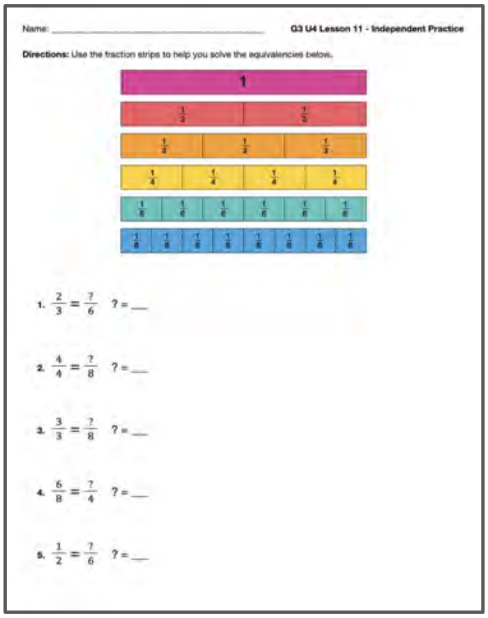
Directions: Find the missing numerator in each equivalent pair of fractions. Use fraction strips to prove their equivalency.

1. $\frac{1}{4} = \frac{?}{8}$? = ___

2. $\frac{2}{2} = \frac{?}{4}$? = ___

3. $\frac{4}{6} = \frac{?}{3}$? = ___

On your Own:


Name: ______________________ G3 U4 Lesson 11 - Independent Practice

Directions: Use the fraction strips to help you solve the equivalencies below.

1

$\frac{1}{2}$ $\frac{1}{2}$

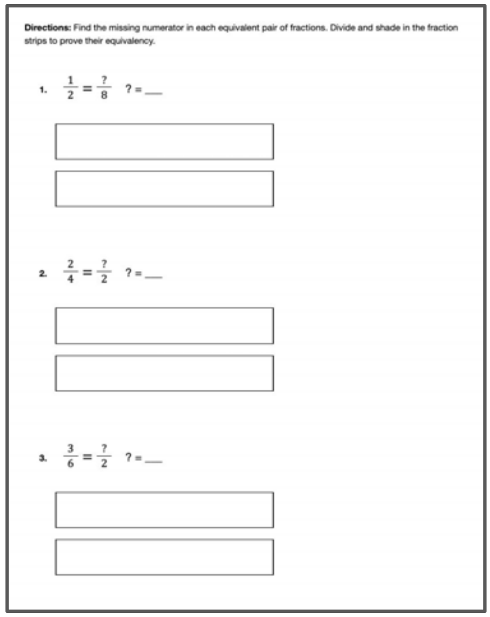
$\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$

$\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$

$\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$

$\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$

1. $\frac{2}{3} = \frac{?}{6}$? = ___
2. $\frac{4}{4} = \frac{?}{8}$? = ___
3. $\frac{3}{3} = \frac{?}{8}$? = ___
4. $\frac{6}{8} = \frac{?}{4}$? = ___
5. $\frac{1}{2} = \frac{?}{6}$? = ___


Directions: Find the missing numerator in each equivalent pair of fractions. Divide and shade in the fraction strips to prove their equivalency.

1. $\frac{1}{2} = \frac{?}{8}$? = ___
2. $\frac{2}{4} = \frac{?}{2}$? = ___
3. $\frac{3}{6} = \frac{?}{2}$? = ___

Name: ____ **G3 U4 Lesson 11 - Let's Try It**

Directions: Find the missing numerator in each equivalent pair of fractions. Use fraction strips to prove their equivalency.

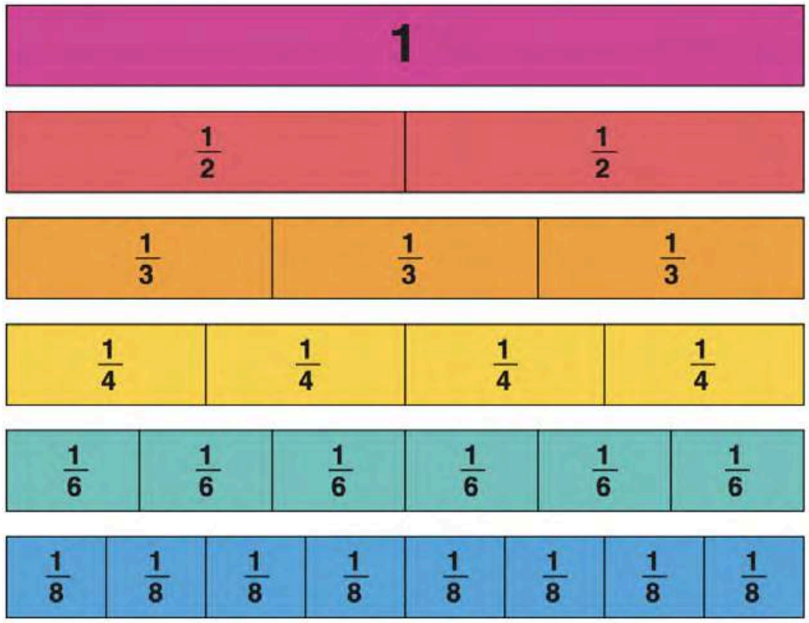
1. $\frac{1}{4} = \frac{?}{8}$? = ___

2. $\frac{2}{2} = \frac{?}{4}$? = ___

3. $\frac{4}{6} = \frac{?}{3}$? = ___

Name: ____ **G3 U4 Lesson 11 - Independent Work**

Directions: Use the fraction strips to help you solve the equivalencies below.



1. $\frac{2}{3} = \frac{?}{6}$? = ___

2. $\frac{4}{4} = \frac{?}{8}$? = ___

3. $\frac{3}{3} = \frac{?}{8}$? = ___

4. $\frac{6}{8} = \frac{?}{4}$? = ___

5. $\frac{1}{2} = \frac{?}{6}$? = ___

Directions: Find the missing numerator in each equivalent pair of fractions. Divide and shade in the fraction strips to prove their equivalency.

1. $\frac{1}{2} = \frac{?}{8}$ $? =$ ___

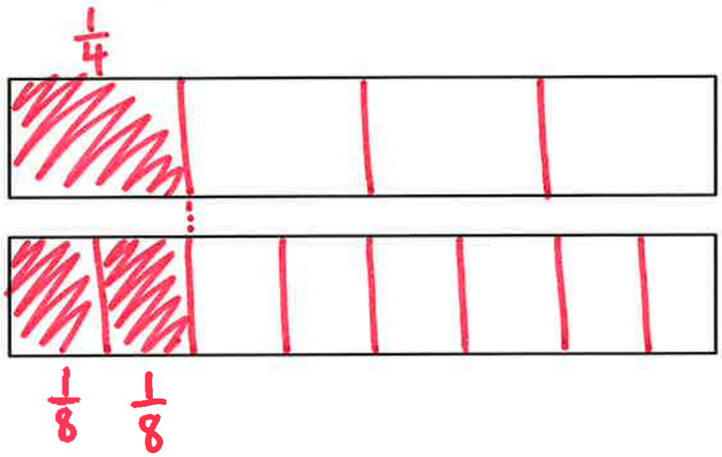
2. $\frac{2}{4} = \frac{?}{2}$ $? =$ ___

3. $\frac{3}{6} = \frac{?}{2}$ $? =$ ___

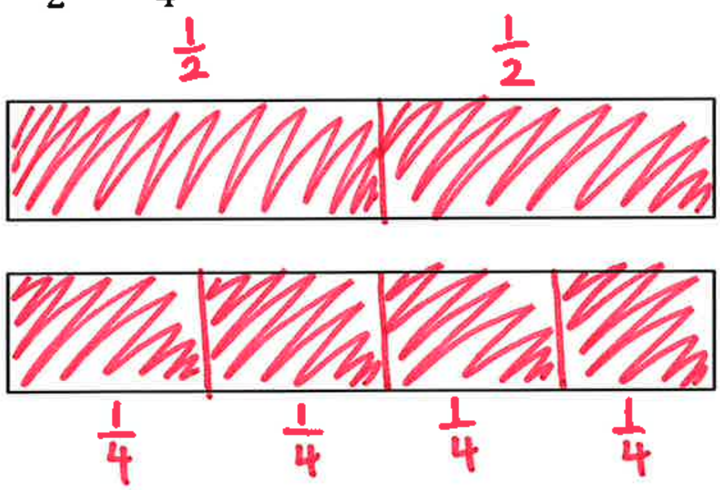
Name: ANSWER KEY

Directions: Find the missing numerator in each equivalent pair of fractions. Use fraction strips to prove their equivalency.

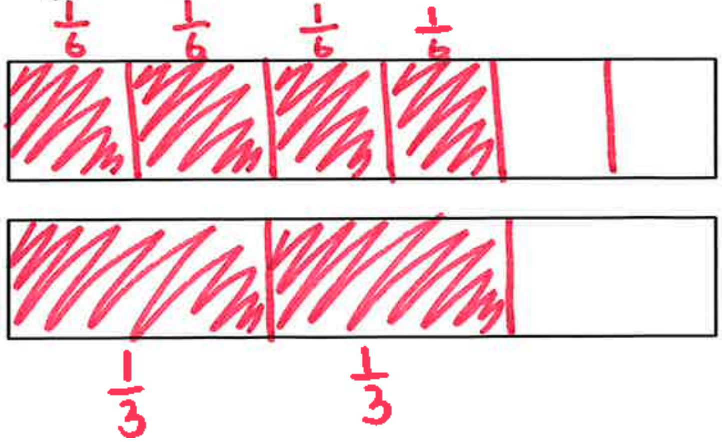
1. $\frac{1}{4} = \frac{?}{8}$? = 2



2. $\frac{2}{2} = \frac{?}{4}$? = 4



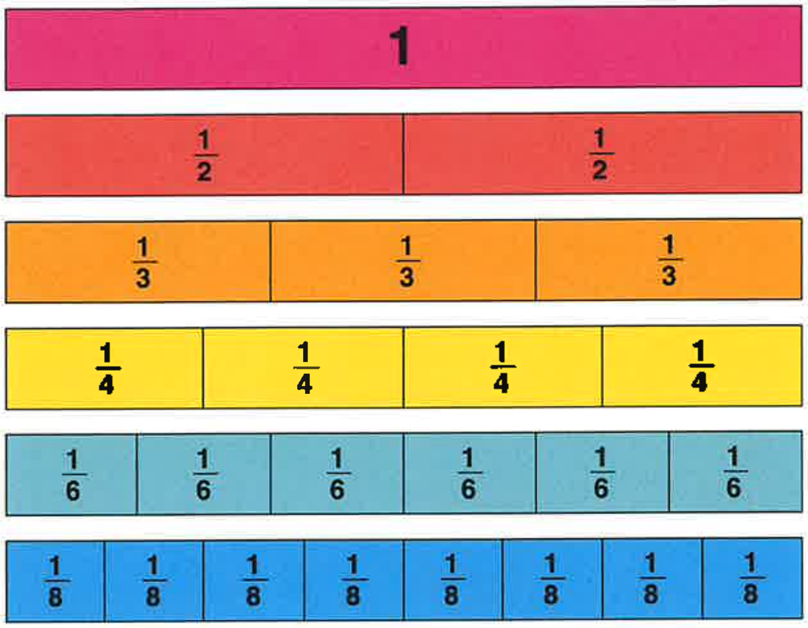
3. $\frac{4}{6} = \frac{?}{3}$? = 2



Name: ANSWER KEY

G3 U4 Lesson 11 - Independent Practice

Directions: Use the fraction strips to help you solve the equivalencies below.



1. $\frac{2}{3} = \frac{?}{6}$? = 4

2. $\frac{4}{4} = \frac{?}{8}$? = 8

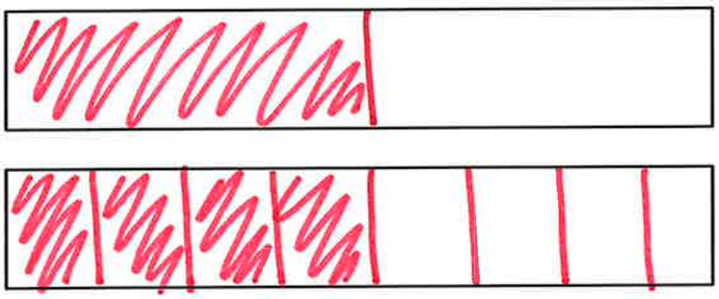
3. $\frac{3}{3} = \frac{?}{8}$? = 8

4. $\frac{6}{8} = \frac{?}{4}$? = 3

5. $\frac{1}{2} = \frac{?}{6}$? = 3

Directions: Find the missing numerator in each equivalent pair of fractions. Divide and shade in the fraction strips to prove their equivalency.

1. $\frac{1}{2} = \frac{?}{8}$ $? = \underline{4}$



2. $\frac{2}{4} = \frac{?}{2}$ $? = \underline{1}$

3. $\frac{3}{6} = \frac{?}{2}$ $? = \underline{1}$

G3 U4 Lesson 12

Use number lines to find equivalent fractions

G3 U4 Lesson 12 - Students will use number lines to find equivalent fractions

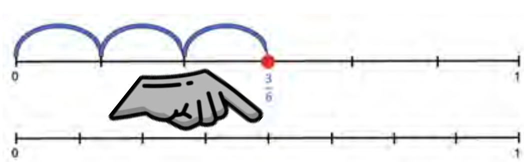
Warm Welcome (Slide 1): Tutor choice.

Frame the Learning/Connect to Prior Learning (Slide 2): In the last lesson we used fraction strips to find equivalent fractions like $\frac{1}{2} = \frac{2}{4}$. We saw that fractions are equivalent when they take up the same amount of space and are the same size. Today, we're doing the exact same work, but this time with a number line!

Let's Talk (Slide 3): We have two number lines here - one cut into halves and one into sixths. Using what we learned last lesson, **how could we use these number lines to find equivalencies?** Possible Student Answers, Key Points:

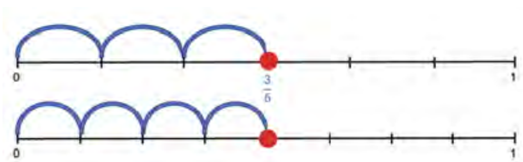
- We can look to see where the lines match up!
- We're looking to see what parts of the first number line (halves) take up the same amount of space as the second number line (sixths).
- They're just like fraction tiles, you can see where they line up!

Let's Think (Slide 4): Great thinking! So, knowing that we're looking for parts that line up and take up the same amount of space, let's look at these two number lines - the top is cut into sixths and the bottom number line is cut into eighths. The question says, how many eighths are in **3** sixths?

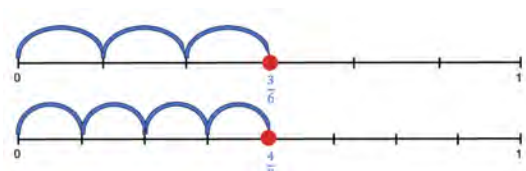


Let's start with what we know - we have three sixths, so I'm going to find that on the number line first. I'm going to take three hops and now I know where $\frac{3}{6}$ is, so I'll put a dot right here.

Now, I need to find the same spot on the eighths number line to find an equivalent fraction. Remember, I'm trying to find *equivalent* fractions, so they have to take up the same amount of space. So, look, I can just drag my finger down and mark it.



So, let me go back and draw hops…I'm going to stop here because I can see that the ticks match up perfectly! That means they both take up the same amount of space.

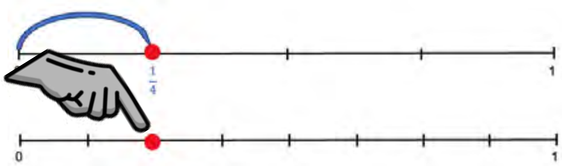


Now, let me go back and count the hops so I can label the point! (*Retrace the hops and count as you go, then label the tick* $\frac{4}{8}$)

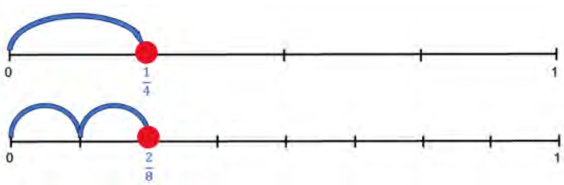
Looking at these two number lines, I can see that $\frac{3}{6} = \frac{4}{8}$! Looking at this equation, **what do you notice about the two fractions that makes sense they would be equivalent?** Possible Student Answers, Key Points:

- It makes sense because three is half of 6 and four is half of 8, so they're both equivalent to ½
- Both numbers are half of a whole, so they're both equal to ½, so they'd also be equal to each other!

Let's Think (Slide 5): Let's try this one. What are we finding equivalencies for in this problem? Eighths and fourths. We want to see how many eighths are in ¼. Right!



So how would I start? Find $\frac{1}{4}$ on the number line because it's what we know already. Ok, let's do that and label it. Now, what should we do? Mark the same spot on the number line!



What's my next step? We're going to hop on the eighths number line until we get to the same spot - because that'll mean they're the same size pieces.

So, looking at these two number lines, what equivalency do you see? $\frac{1}{4} = \frac{2}{8}$ Great job! Write that down on your board! So, let me ask you again, looking at this equation, what do you notice about the two fractions that makes sense they would be equivalent?Possible Student Answers, Key Points:

- It makes sense because for us to make eighths we have to cut a fourth in half. So there has to be two eighths in one fourth.
- It makes sense because when we're cutting our number line into eighths we cut every fourth into two pieces - so we have two eighths in every fourth we made in our number line.
- They are the same size and take up the same amount of space.

Let's Try it (Slides 6): So, as you work today, remember that fractions are equivalent when they are the same size and **take up the same amount of space**. You can figure out if they're equivalent by making sure they are equal sized pieces on a number line. Remember to use your hops to find the correct numerator, or number of parts, that will create an equivalency!

WARM WELCOME

Today we will use number lines to find equivalent fractions.

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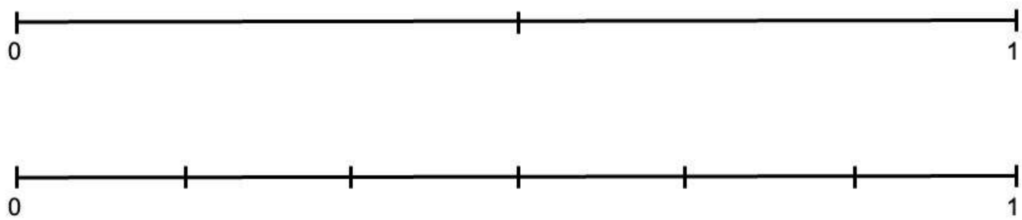
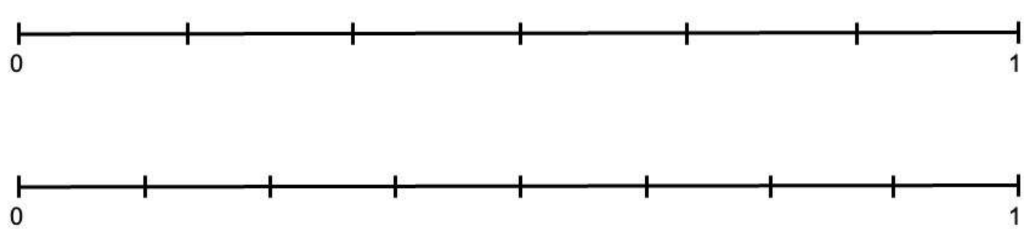
Let’s Talk:

How could we use these number lines to find equivalencies?



Let’s Think:

How many eighths are in three-sixths?



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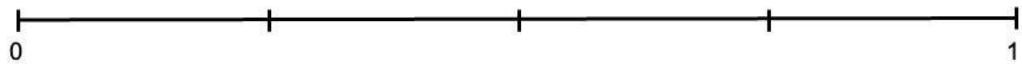
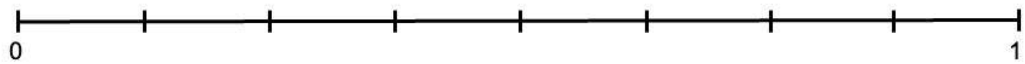
Let's Think:

How many eighths are in one-fourth?





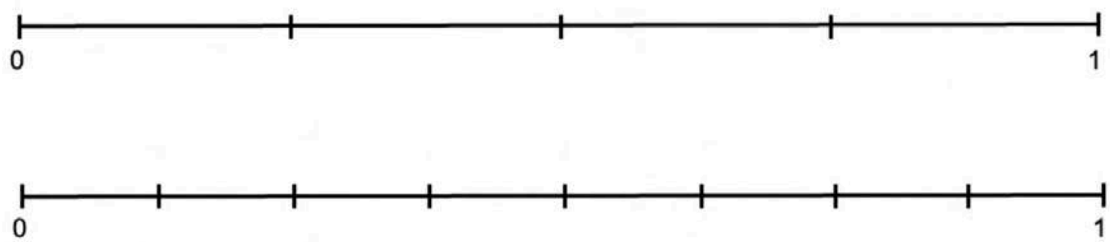
Let's Try It:

On your Own:

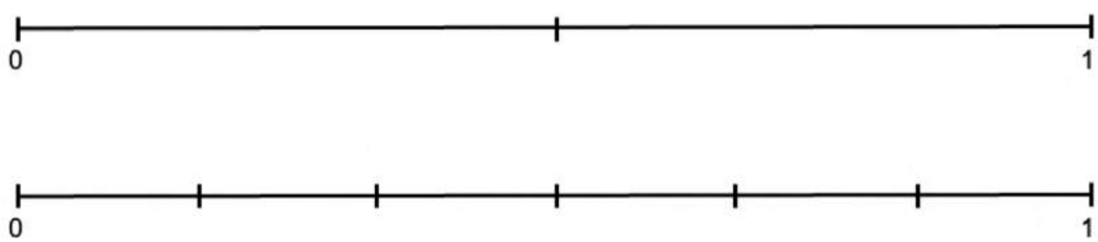
Name: ____

Directions: Find the missing numerator in each equivalent pair of fractions. Use the number lines to prove the equivalency.

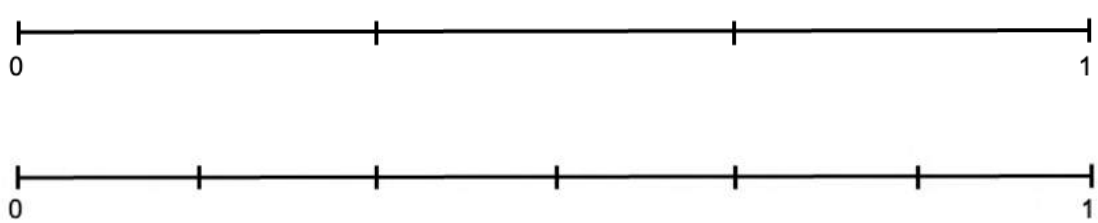
1. $\frac{2}{4} = \frac{?}{8}$? = ___



2. $\frac{1}{2} = \frac{?}{6}$? = ___

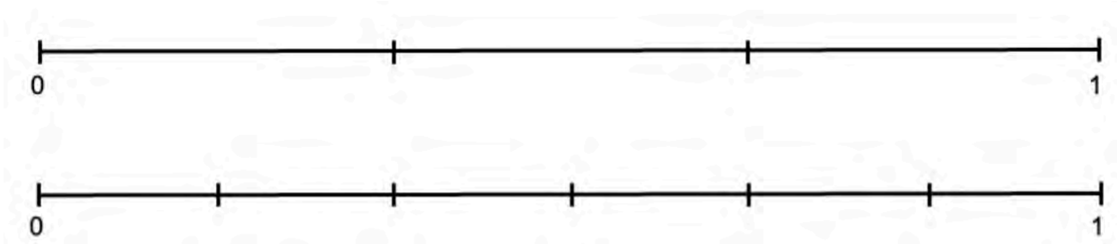


3. $\frac{4}{6} = \frac{?}{3}$? = ___

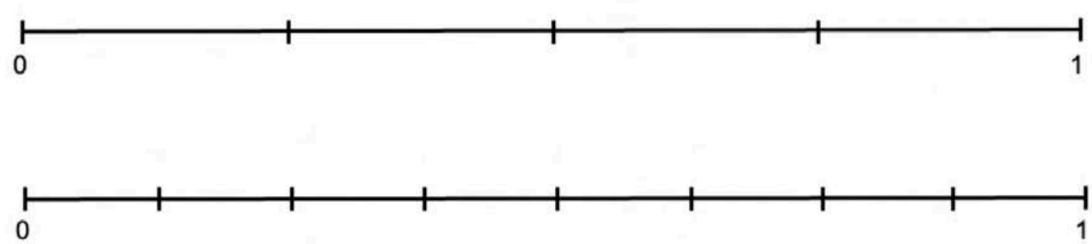


Directions: Use the number lines below to help you solve the missing numerators to each equivalency.

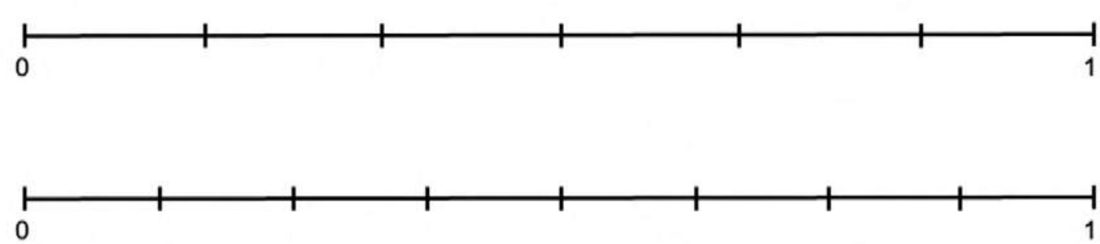
1. $\frac{2}{3} = \frac{?}{6}$? = ___



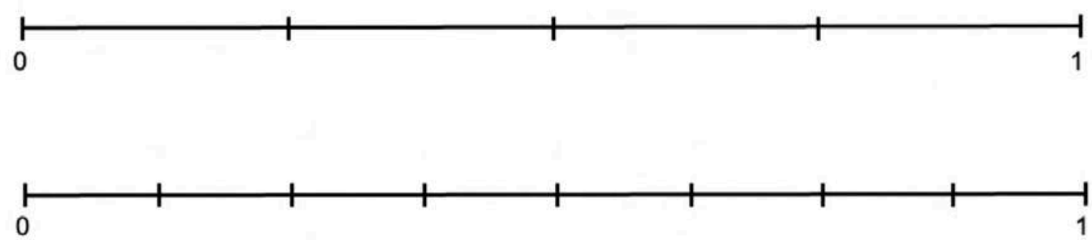
2. $\frac{4}{4} = \frac{?}{8}$? = ___



3. $\frac{3}{6} = \frac{?}{8}$? = ___

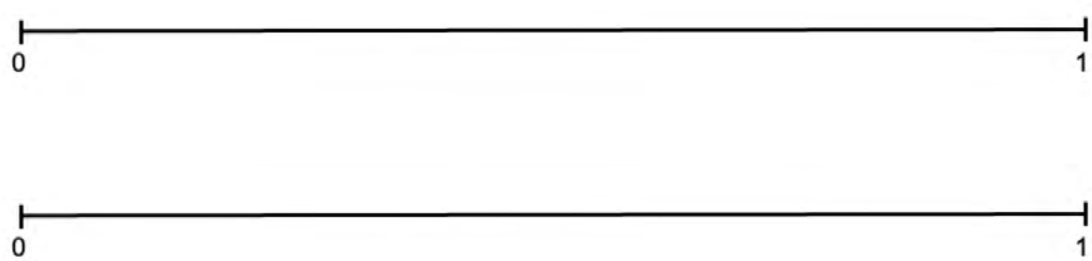


4. $\frac{6}{8} = \frac{?}{4}$? = ___

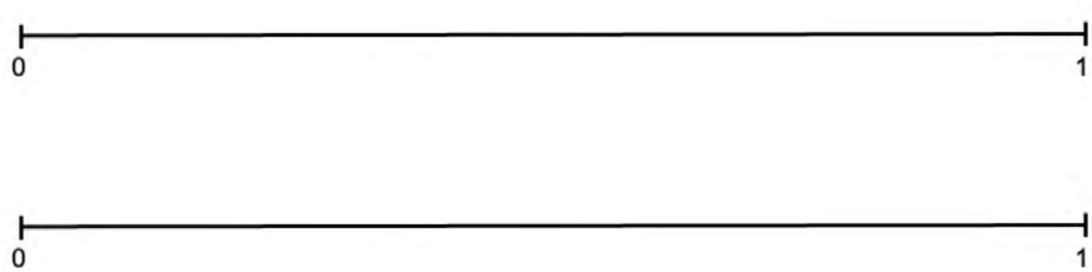


Directions: Find the missing numerator in each equivalent pair of fractions. Divide the number line to find and prove your answer.

1. $\frac{1}{4} = \frac{?}{8}$? = ___



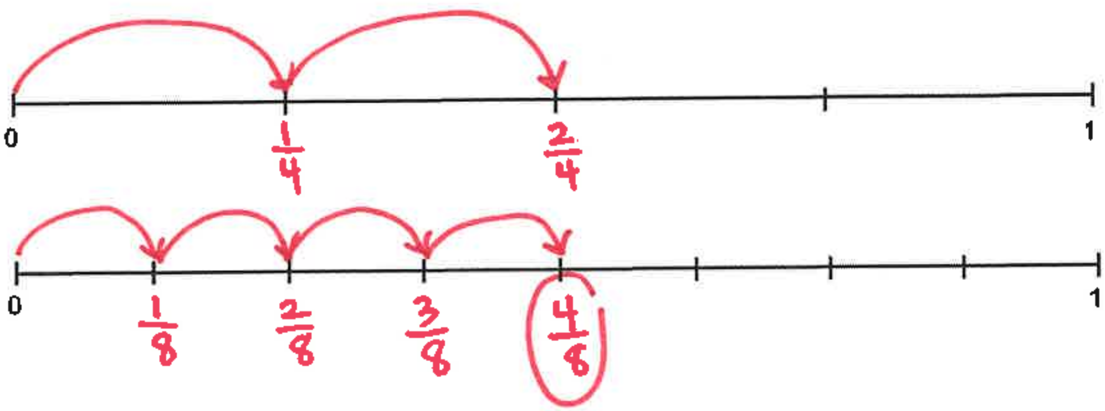
2. $\frac{2}{4} = \frac{?}{2}$? = ___



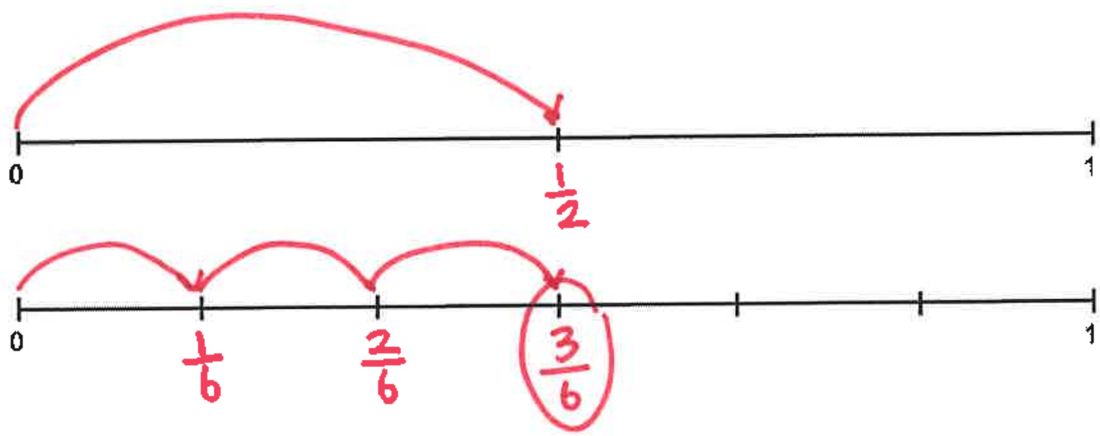
Name: ANSWER KEY

Directions: Find the missing numerator in each equivalent pair of fractions. Use the number lines to prove the equivalency.

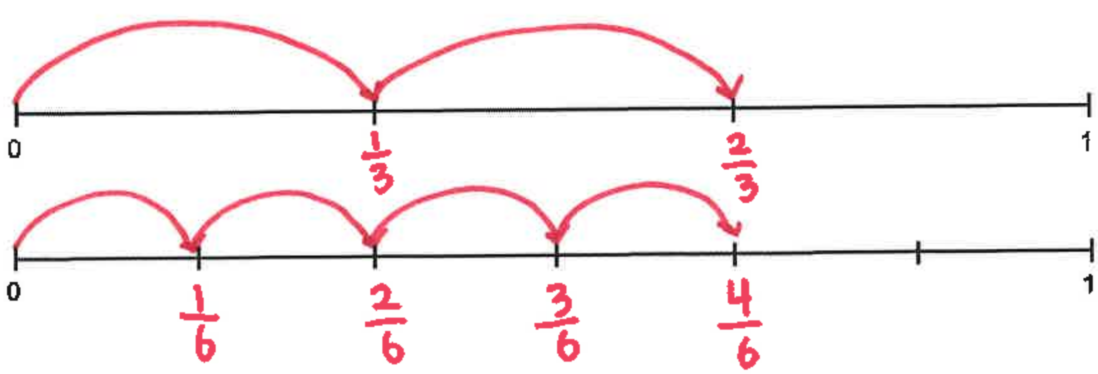
1. $\frac{2}{4} = \frac{?}{8}$? = 4



2. $\frac{1}{2} = \frac{?}{6}$? = 3



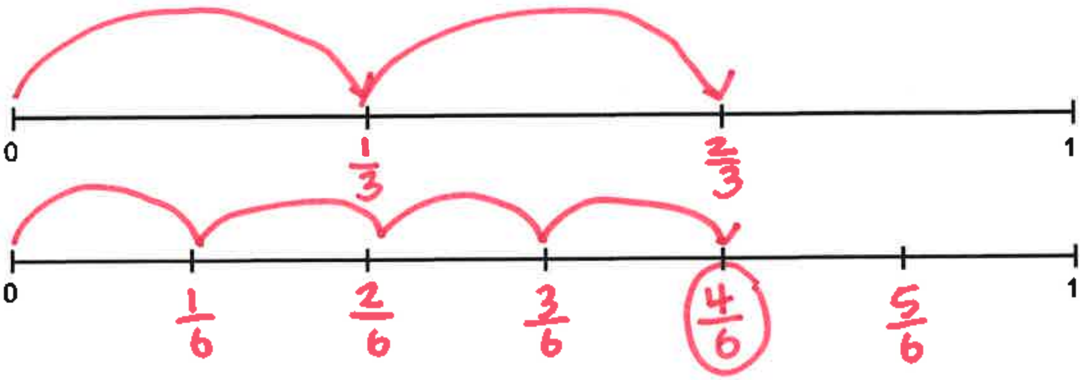
3. $\frac{4}{6} = \frac{?}{3}$? = 2



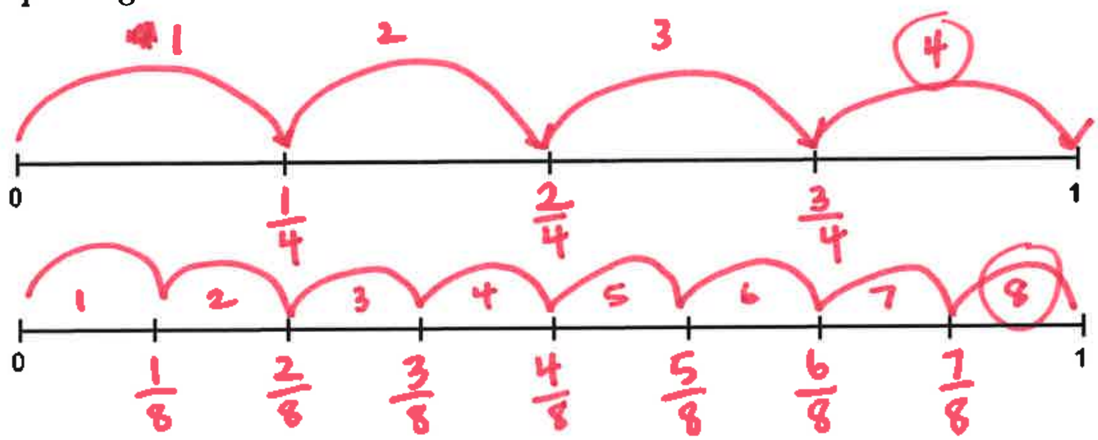
Name: ANSWER KEY

Directions: Use the number lines below to help you solve the missing numerators to each equivalency.

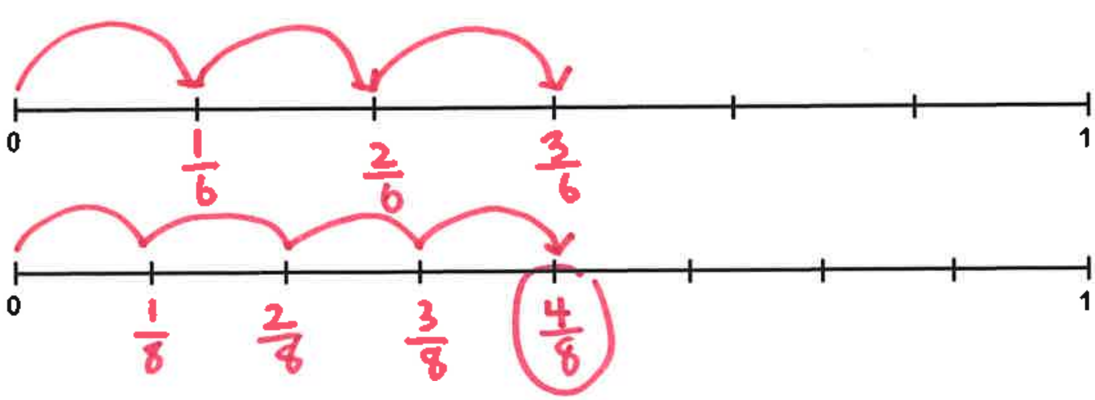
1. $\frac{2}{3} = \frac{?}{6}$? = 4



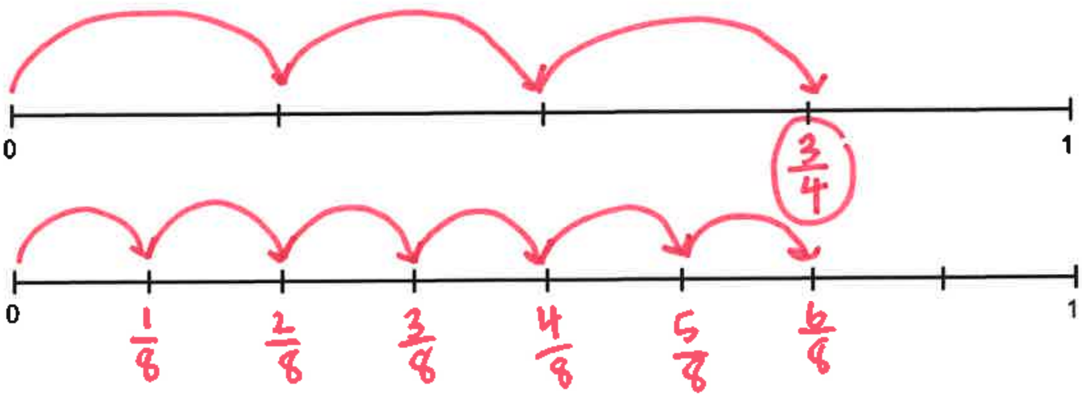
2. $\frac{4}{4} = \frac{?}{8}$? = 8



3. $\frac{3}{6} = \frac{?}{8}$? = 4

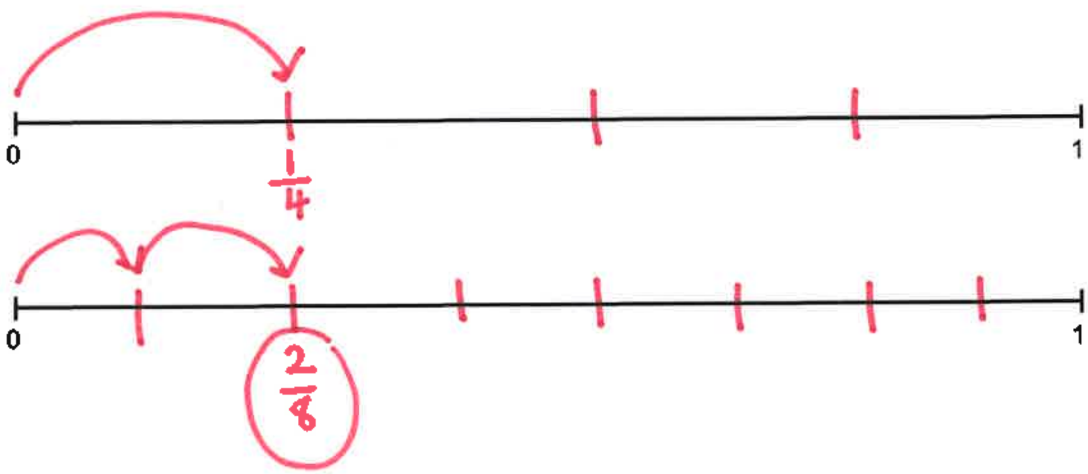


4. $\frac{6}{8} = \frac{?}{4}$? = 3

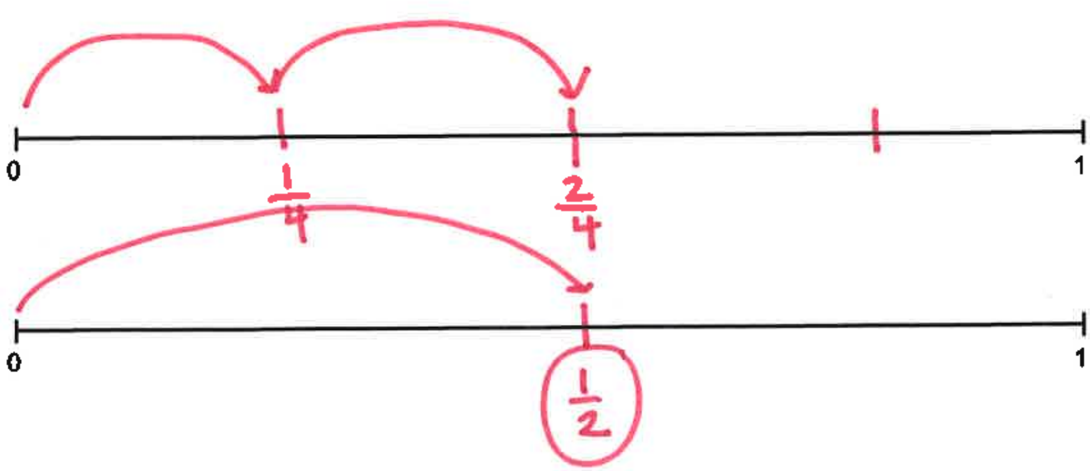


Directions: Find the missing numerator in each equivalent pair of fractions. Divide the number line to find and prove your answer.

1. $\frac{1}{4} = \frac{?}{8}$? = 2



2. $\frac{2}{4} = \frac{?}{2}$? = 1



CITYTUTOR DC

G3 Unit 5:

Classifying Shapes

G3 U5 Lesson 1

Describe shapes

CITYTUTOR DC

G3 U5 Lesson 1 - Students will describe the attributes of shapes.

Tutor Notes: Students begin developing their knowledge and understanding of shapes while they are in Kindergarten by learning to classify and describe two-dimensional (flat) and three-dimensional (solid) shapes. They learn vocabulary to use to describe shapes such as side, corner, square, cube, sphere, circle, triangle, and rectangle. As students further develop their understanding of shapes in first, second, third grade, they learn to classify shapes by their attributes. In K-2 this primarily means that they classify shapes by the number of sides that they have - triangles have three sides, hexagons have six sides, etc. While it is helpful for students to identify where they see these shapes in the real world, the concepts they must understand are how the attributes of the shape are how we classify and name the shape.

Warm Welcome (Slide 1): Tutor choice.

Frame the Learning/Connect to Prior Learning (Slide 2): Today we will be learning about shapes. You've probably been learning how to identify shapes since you were in pre-k, but we are going to dig deeper into our knowledge of shapes by considering their attributes or characteristics. We are going to be thinking about what makes one set of shapes different from another and how we can classify or organize the shapes. Today, we are going to make sure we all understand attributes like the number of sides and angles a shape has so that we can build on that learning with more complex ideas in our next lessons.

Let's Talk (Slide 3): Before we dive into our work today. I want to find out what you may already know about shapes. Let's take a look at a few shapes on this slide. **How might we describe these shapes to someone else?** Possible Student Answers, Key Points:

- The first one is called a triangle, it has three straight sides and three angles.
- The first one is flat or two-dimensional
- I also see a cube or a box.This is a cube.
- The cube is a solid or 3D shape, the cube has six faces that are squares.
- I see a trapezoid, another word for it is quadrilateral because it has 4 sides.
- The quadrilateral has 4 sides and 4 angles, it's flat which means it's two-dimensional.

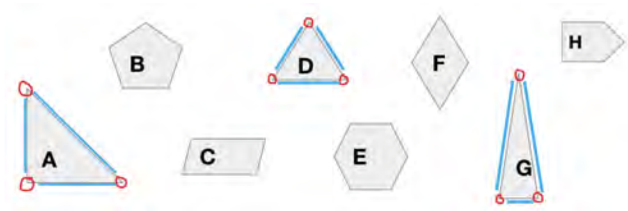
Note: Students likely will know the names of the triangle and the cube. If the students just provide the name of the shape, prompt them to describe something else they notice about the shape. Ask, "What if I didn't know what a cube was, what else might you tell me about the cube?"

Let's Talk (Slide 4) I love how you noticed and described different things about the shapes. You noticed that the shapes have straight sides and points! Those characteristics are called attributes. Today we are going to think about two important attributes of shapes, the number of sides the shape has and the number of angles a shape has.

- Today we'll be looking at 2-D shapes but it's important to notice that some shapes are two-dimensional or flat–like this triangle and this quadrilateral! And some shapes are solid, or three-dimensional, like this cube. Shapes that are 3D are shapes that you can pick up and look at from the top, bottom, or side. Today we're going to be working with attributes for 2D shapes. We can classify, or name 2D shapes based on how many sides and angles they have.
- Here's an example of a straight side (trace with finger). Do you see any other straight sides on the 2D shapes? Come trace them! (*Give students the opportunity to find other straight sides and trace them with their finger.*)
- This is an example of an angle (*point*). Do you see any other angles on the 2D shapes? Come point to them!

Very nice! You all told me that this shape is a triangle and we can describe it as having 3 straight sides and 3 angles. And this shape is a quadrilateral and it has 4 straight sides and 4 angles.

Let's Think (Slide 5): Let's see if we can use some of those ideas to help us identify and describe shapes. Let's look at the shapes on the slide. Which of these shapes have 3 sides and 3 angles? Shapes A, D, G!



That's right, shape A has 3 sides and 3 angles (*trace sides, circle angles*).

Shape D has 3 sides and 3 angles (*trace sides, circle angles*).

Finally, Shape G is a tall thin triangle with 3 sides and 3 angles.

Great job identifying the shapes with 3 sides and 3 angles. Any shape that has 3 sides and 3 angles is called a triangle.

Let's Think (Slide 6): Great job! Now, let's look at the shapes again. What other shapes might we be able to put in a group together based on their attributes? Why? Possible Student Answers, Key Points:

- Shapes C, F, and H all have 4 sides and 4 angles.
- Shapes B and I have 5 sides and 5 angles.
- Shapes E and J have 6 sides and 6 angles.

Note: If the student struggles to find shapes that can be grouped together, prompt the student to start by counting (and tracing if applicable) sides and see if they can find shapes that have the same number of sides. Then, prompt them to check how many angles the shape has as well (students can circle the angles they see to model the counting). Many students may not know the formal names "quadrilaterals", "pentagons", and "hexagons" yet. If they are successful in grouping shapes together by sides and angles, ask, "Do you know what shapes with 4 sides and 4 angles are called? 5 sides and 5 angles? 6 sides and 6 angles?" If they do not know yet, you will recap the names on the next slides.

Let's Think (Slide 7): Let's check to see how we did. We could have created four groups of shapes based on how many sides and angles they have. We could've grouped all of the shapes with 4 sides and 4 angles together, those are called quadrilaterals. We also coul've put B and I together because they both have 5 sides and 5 angles, those are called pentagons. And finally, we could've put E and J together because they both have 6 sides and 6 angles, those are called hexagons! You did a great job reasoning with the shapes to classify them into groups. Let's review the names of the groups we created before we move into our practice.

Let's Think (Slide 9): Here is a helpful reminder of the groups of shapes we just looked at based on the number of sides and the number of angles they have. Let's review the shapes we discussed today together before we practice. *Ask the student to restate the names of shapes and their key attributes discussed in today's lesson.*

Let's Try it (Slide 9): Now, we are going to work together to apply what we have learned about describing the attributes of shapes and naming shapes. Remember, we use attributes like the number of sides and angles to help us name the shapes correctly.

WARM WELCOME

Today we will describe the attributes of shapes.

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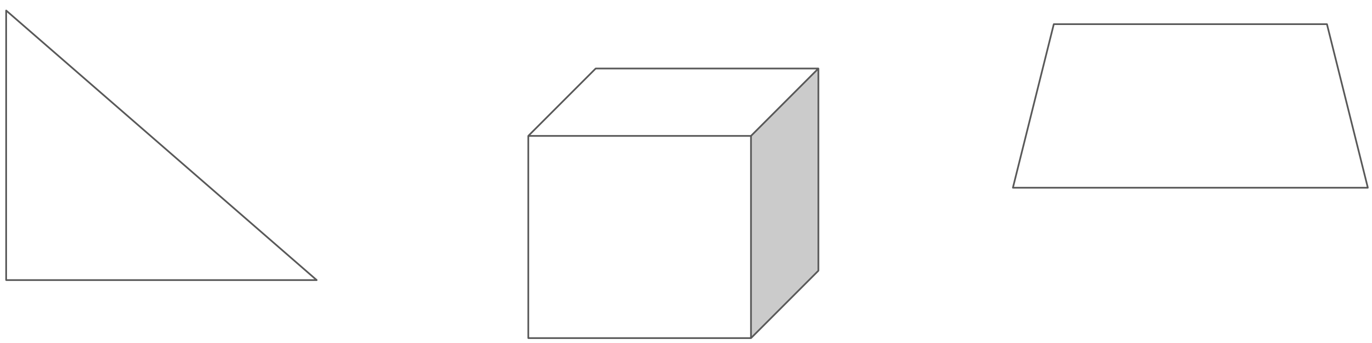
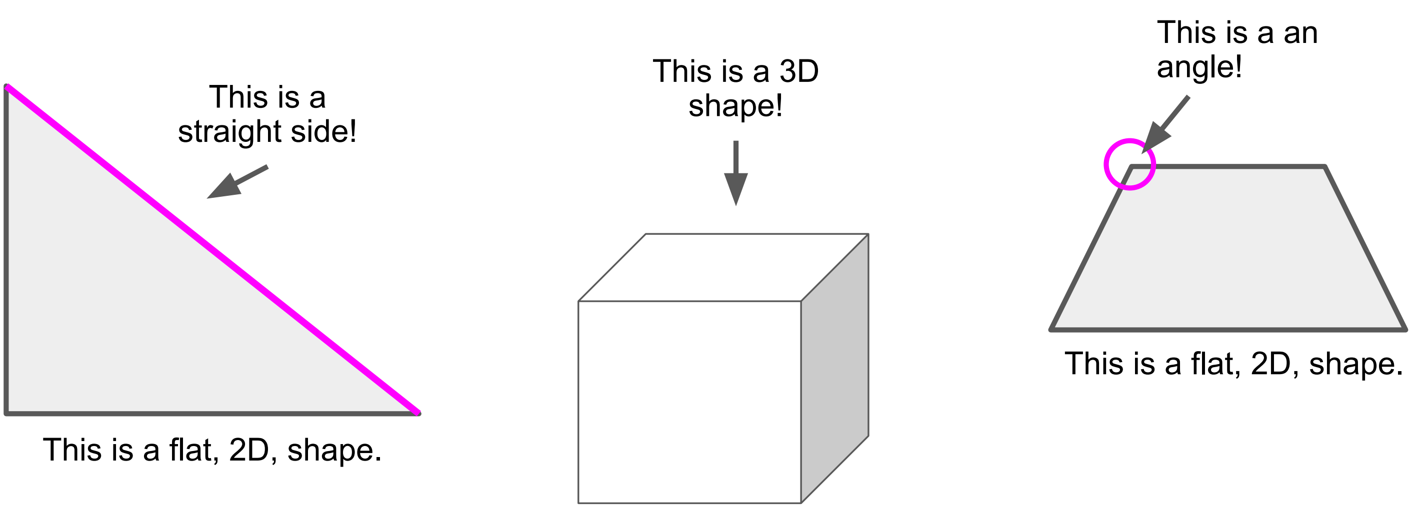
Let's Talk:

Let's look at these shapes. How might we describe these shapes to someone else?

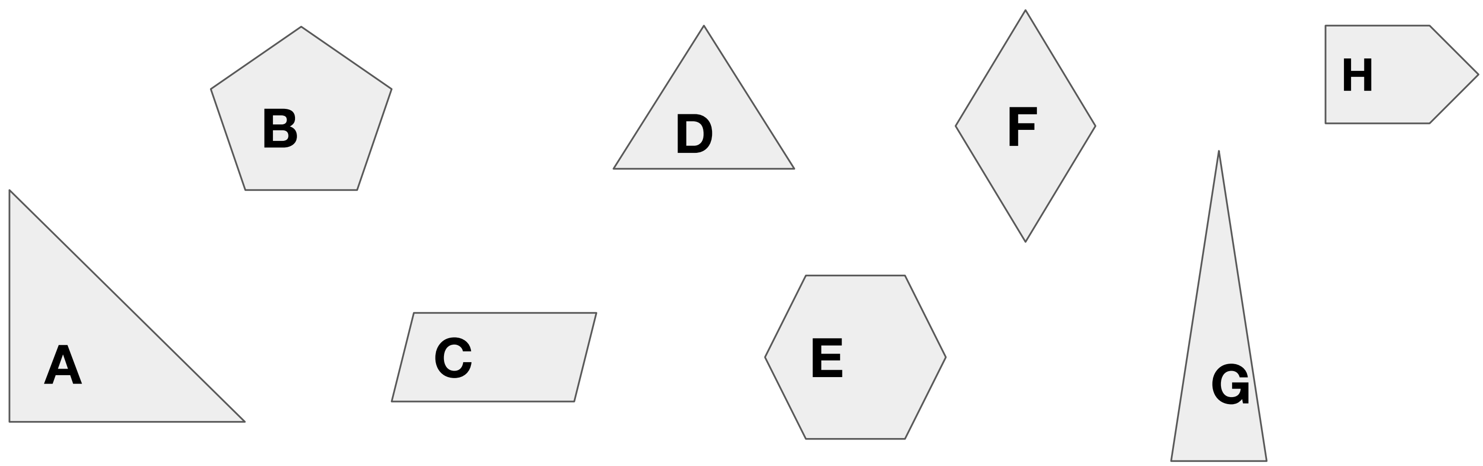


Let's Think:

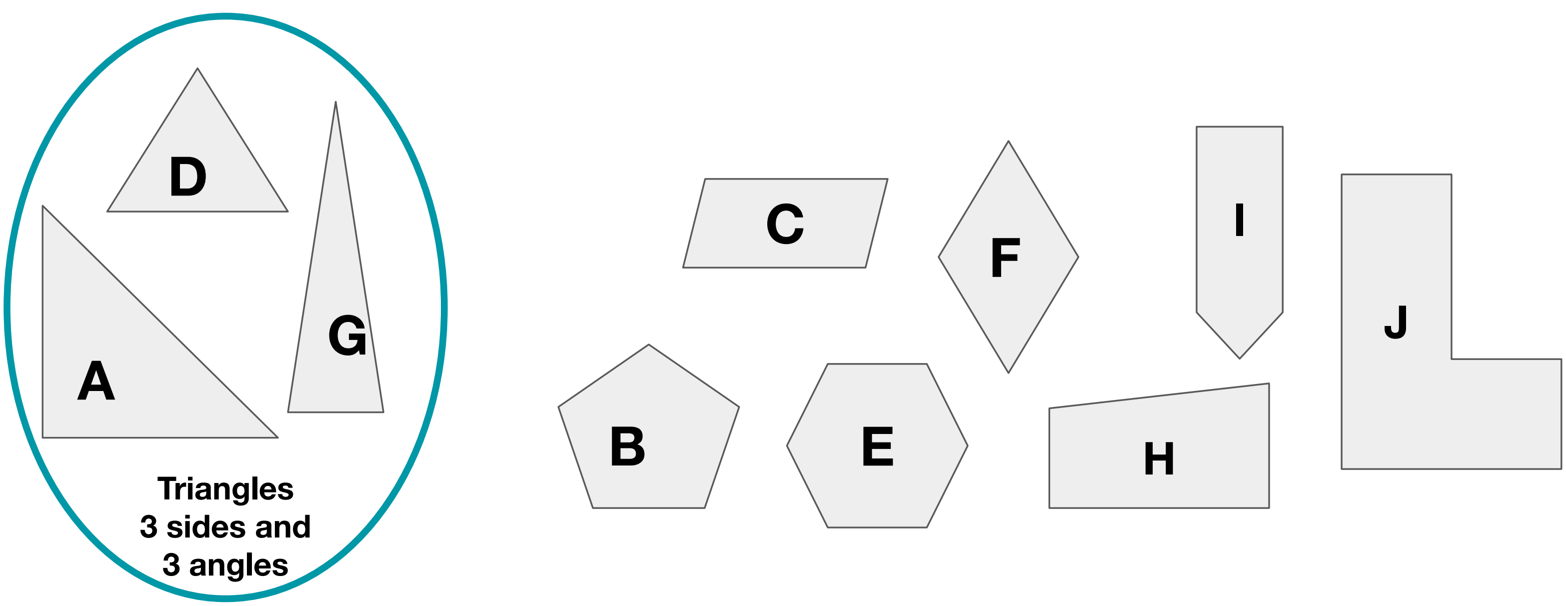
We can describe shapes by their **sides**, their **angles**, or whether they are **flat** (2D) or **solid** (3D).



Let's Think: Which shapes have 3 sides and 3 angles? What can we call these shapes?

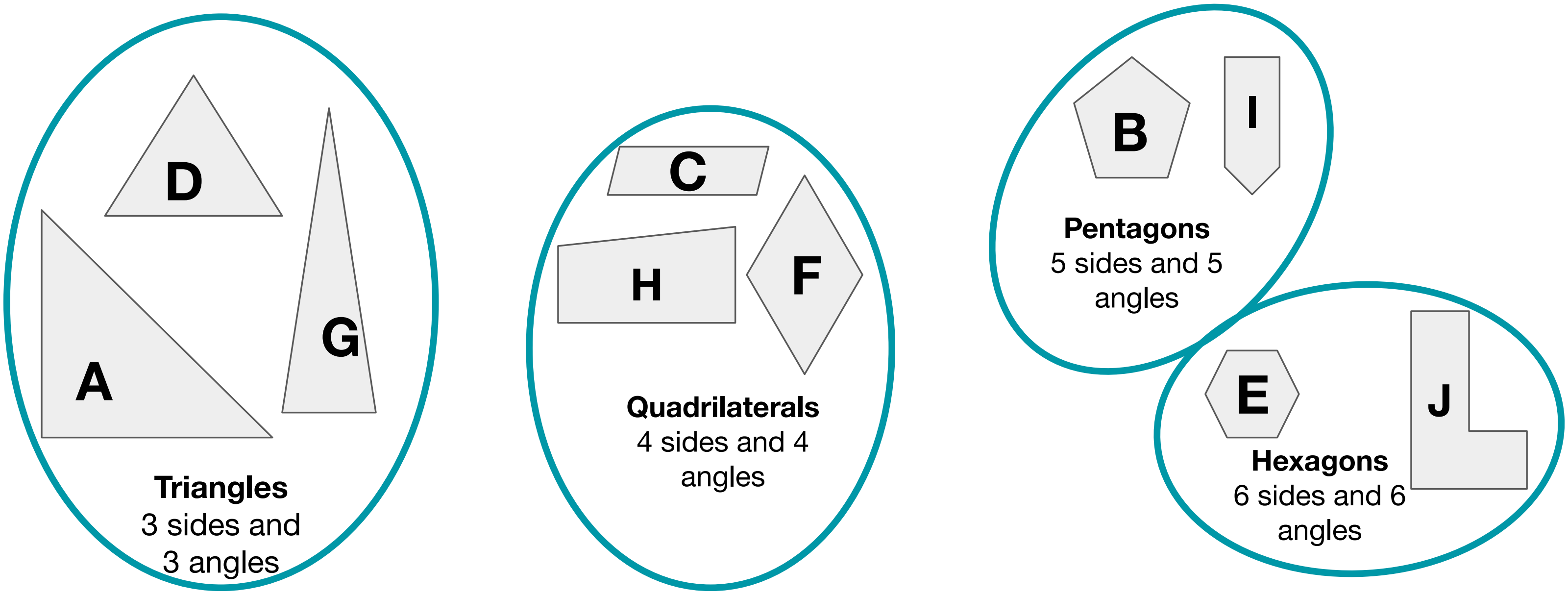


Let's Think: What other shapes might you put in a group together? Why?



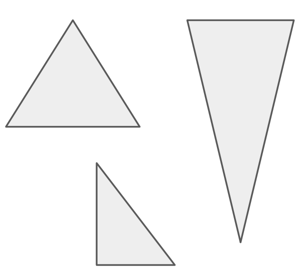
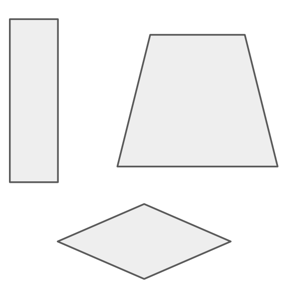
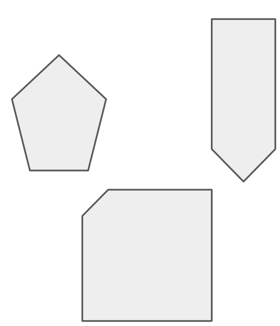
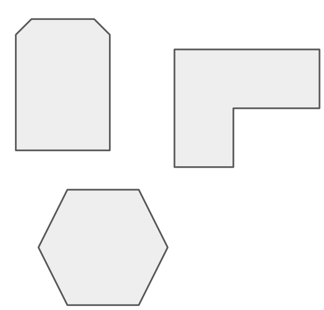
Let's Think:

What other shapes might you put in a group together? Why?



Let's Review:

We can name shapes based on how many sides and angles they have.

Triangles	Quadrilaterals	Pentagons	Hexagons
3 sides 3 angles	4 sides 4 angles	5 sides 5 angles	6 sides 6 angles
			

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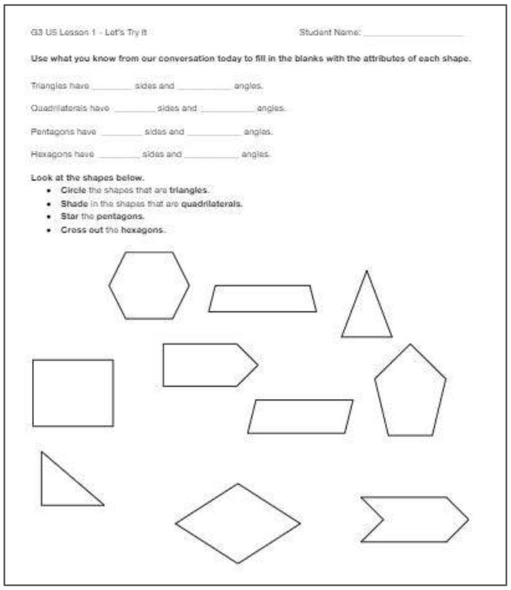
Let's Try It:

Let's explore recognizing attributes of shapes together.


G3 U5 Lesson 1 - Let's Try It   Student Name: ________________

Use what you know from our conversation today to fill in the blanks with the attributes of each shape.

Triangles have ________ sides and __________ angles.

Quadrilaterals have ________ sides and __________ angles.

Pentagons have ________ sides and __________ angles.

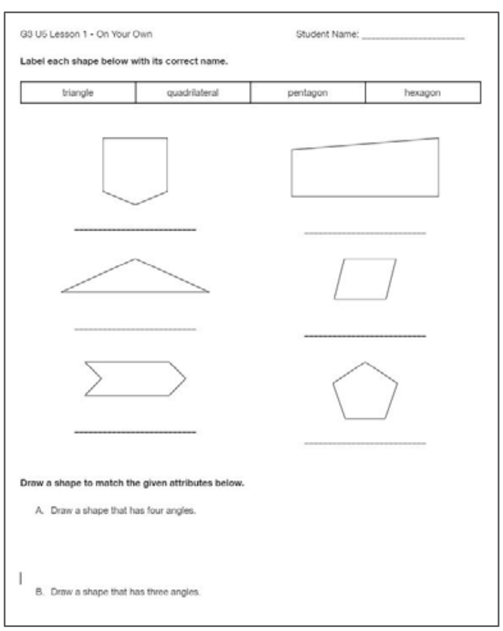
Hexagons have ________ sides and __________ angles.

Look at the shapes below.

- **Circle** the shapes that are **triangles.**
- **Shade** in the shapes that are **quadrilaterals.**
- **Star** the **pentagons.**
- **Cross out** the **hexagons.**

On your Own:

Now it's time to explore recognizing and creating shapes with specific attributes on your own.


G3 U5 Lesson 1 - On Your Own   Student Name: ________________

Label each shape below with its correct name.

triangle	quadrilateral	pentagon	hexagon

Draw a shape to match the given attributes below.

A. Draw a shape that has four angles.

B. Draw a shape that has three angles.

Name: ____

Use what you know from our conversation today to fill in the blanks with the attributes of each shape.

Triangles have ________ sides and ___________ angles.

Quadrilaterals have ________ sides and ___________ angles.

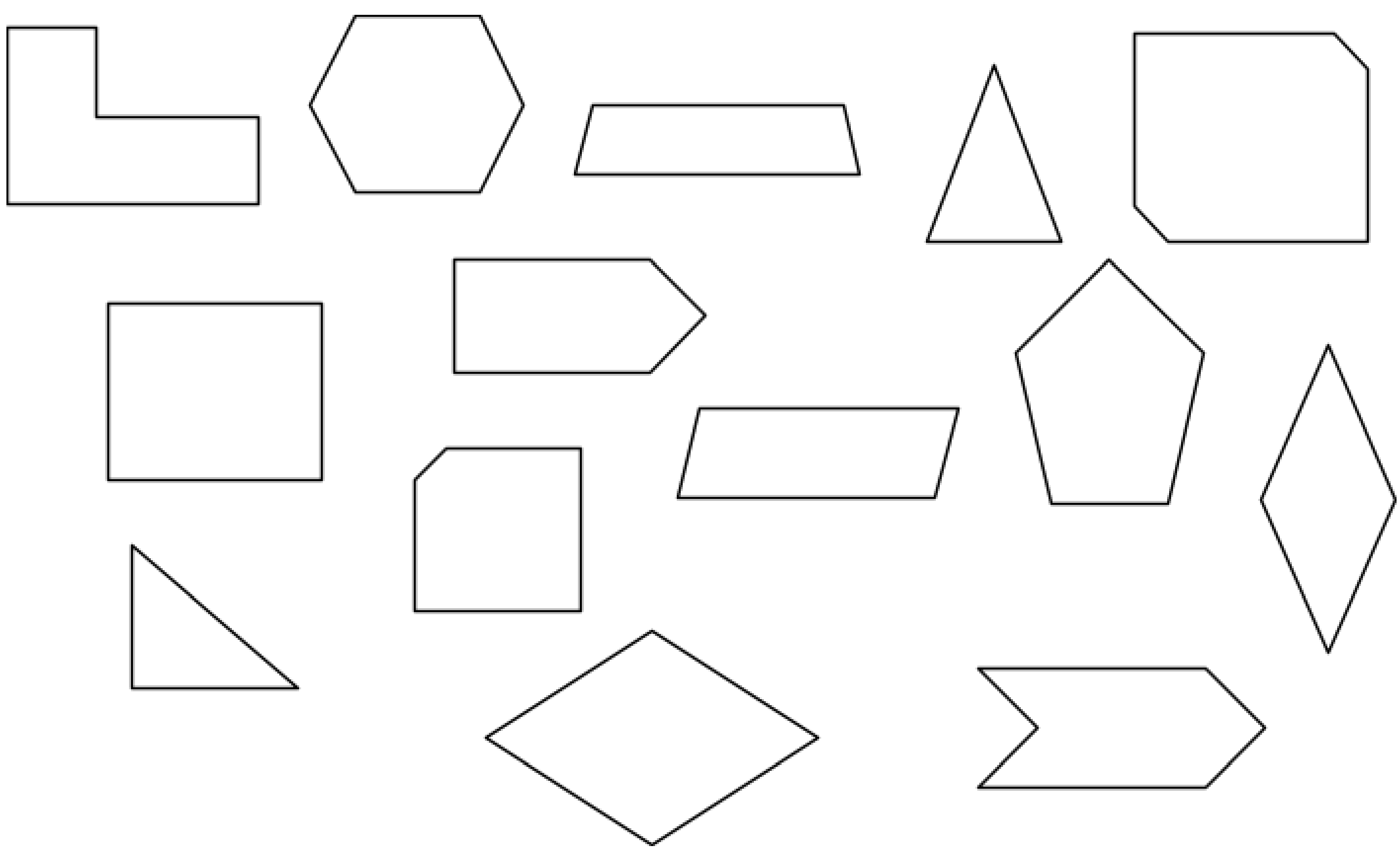
Pentagons have ________ sides and ___________ angles.

Hexagons have ________ sides and ___________ angles.

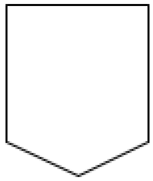
Look at the shapes below.

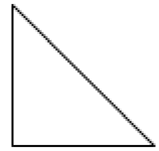
- **Circle** the shapes that are **triangles**.
- **Shade** in the shapes that are **quadrilaterals**.
- **Star** the **pentagons**.
- **Cross out** the **hexagons**.

Remember to trace sides and circle angles to show your counting and classifying.



Which of the following shapes is a quadrilateral?

A 

C 

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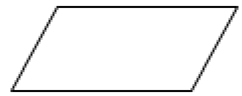
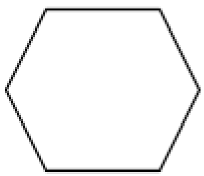
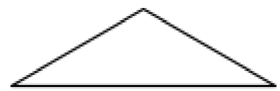
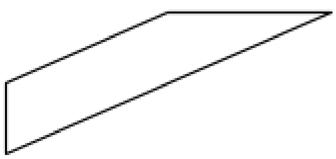
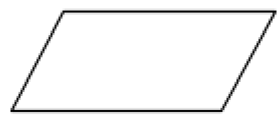
D 

Which of the following shapes has 3 angles?

A 

C 

B 

D 

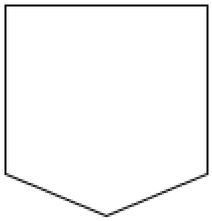
Draw a shape to match the given attributes below.

A. Draw a shape that has four sides and four angles.

B. Draw a shape that has three sides and three angles.

Label each shape below with its correct name.

triangle	quadrilateral	pentagon	hexagon



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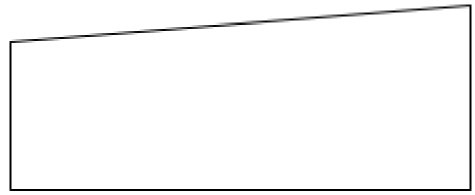

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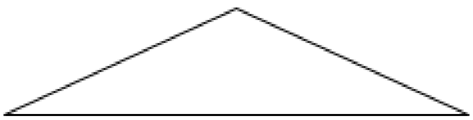

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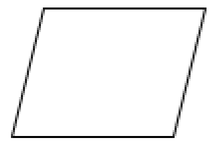

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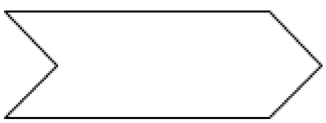

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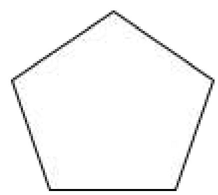


____

Name: Answer Key

G3 U5 Lesson 1 - Let's Try It

Use what you know from our conversation today to fill in the blanks with the attributes of each shape.

Triangles have __3__ sides and __3__ angles.

Quadrilaterals have __4__ sides and __4__ angles.

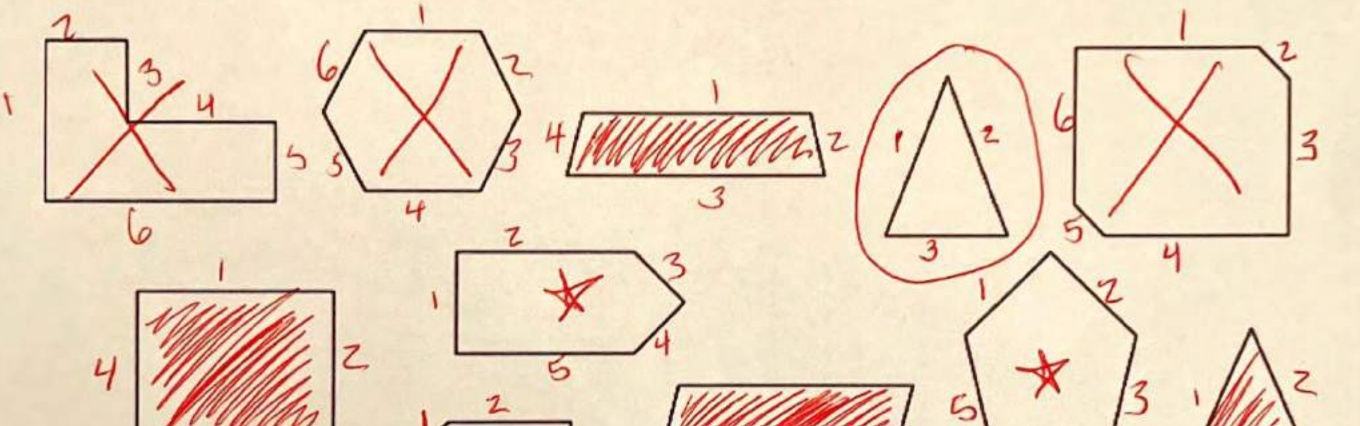
Pentagons have __5__ sides and __5__ angles.

Hexagons have __6__ sides and __6__ angles.

Look at the shapes below.

- **Circle** the shapes that are **triangles.**
- **Shade** in the shapes that are **quadrilaterals.**
- **Star** the **pentagons.**
- **Cross out** the **hexagons.**

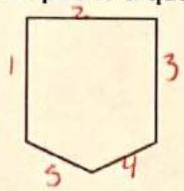
Remember to trace sides and circle angles to show your counting and classifying.

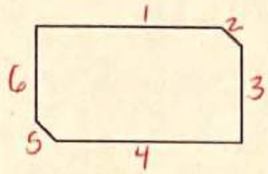


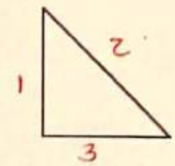
Student Name: Answer Key

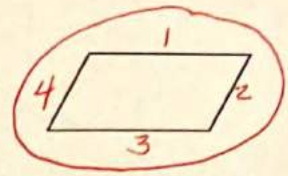
G3 U5 Lesson 1 - Independent Work

Which of the following shapes is a quadrilateral?

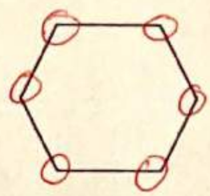
A 

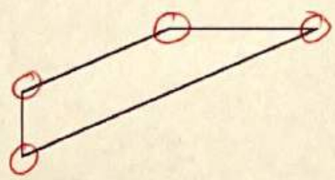
B 

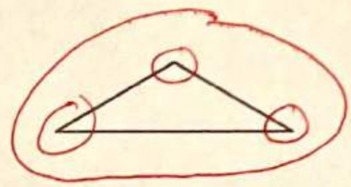
C 

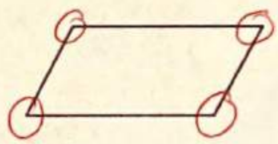
D 

Which of the following shapes has 3 angles?

A 

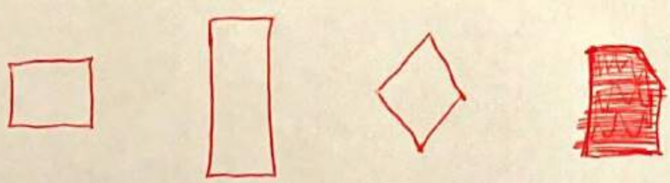
B 

C 

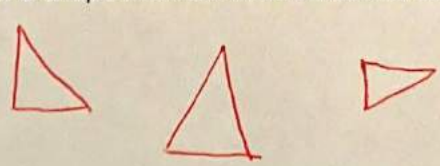
D 

Draw a shape to match the given attributes below.

A. Draw a shape that has four sides and four angles. many correct answers

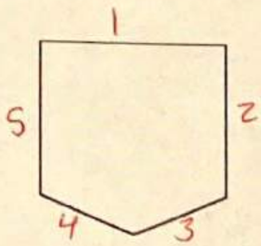


B. Draw a shape that has three sides and three angles. many correct answers

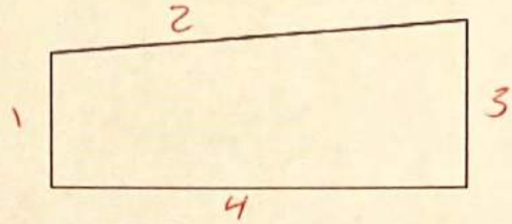


Label each shape below with its correct name.

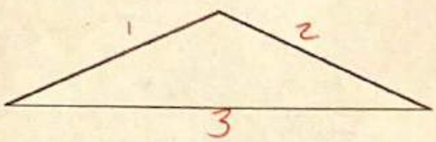
triangle	quadrilateral	pentagon	hexagon



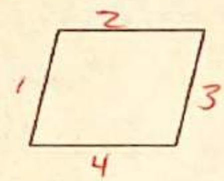
pentagon



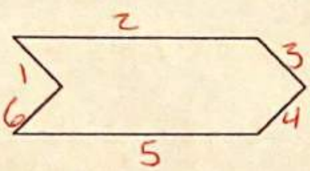
quadrilateral



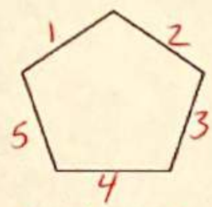
triangle



quadrilateral



hexagon



pentagon

G3 U5 Lesson 2

Describe quadrilaterals

CITYTUTOR DC

G3 U5 Lesson 2- Students will describe attributes of quadrilaterals.

Tutor Notes: In today's lesson you will take students into a deeper understanding of the quadrilateral family. Quadrilaterals are any shape with 4 sides and 4 angles. We may think of the "regular" quadrilaterals like squares, rectangles, rhombuses, and trapezoids, but there are also "irregular" quadrilaterals that do not fit into a more specific subcategory. Quadrilaterals like squares and rectangles, have even more specific attributes that classify them as a subcategory within quadrilaterals, which will be covered in future lessons. However, it is imperative for students to understand that all shapes with 4 sides and 4 angles fall within the broad category of quadrilaterals. Today, if students correctly identify a shape as a rectangle or square, let them know that that's another name for quadrilaterals but today we're naming any shape with 4 sides/4 angles a quadrilateral.

Warm Welcome (Slide 1): Tutor choice.

Frame the Learning/Connect to Prior Learning (Slide 2): Last time we met we started discussing how we can describe or classify shapes based on their attributes. Remember that attributes are characteristics of the shape like the number of sides and number of angles the shape has. Today we are going to specifically focus on a family of shapes called quadrilaterals. Let's see if we can analyze some shapes to decide what some of the attributes of quadrilaterals are.

Let's Talk (Slide 3): Let's take a moment to look at the shapes. We can tell right away that the shapes are not all exactly the same, but they do have some attributes in common. **Take a moment to analyze the shapes and once you notice something that is the same about all of the shapes, give me a thumbs up.** Possible Student Answers, Key Points:

- They all have sides and angles.
- They all have four sides.
- They all have four angles.
- They all have corners
- They are all closed figures.

Nice work looking closely at these shapes! Even though the shapes do not look exactly the same, they all have four sides and they all have four angles (*trace sides, count angles as needed*), and any shape with four sides and four angles is called a quadrilateral. Say that with me…QUADRILATERAL!

Let's Think (Slide 4): So now we understand that quadrilaterals are shapes that have four sides and four angles. Some quadrilaterals are "regular" quadrilaterals that have names like square, rectangle, and trapezoid, and other shapes are "irregular" quadrilaterals that don't have another, more precise name. We will spend time in upcoming lessons discussing that more. For now, let's focus on calling ANY shape with four sides and four angles a quadrilateral. Let's work together to sort the shapes into two groups "Quadrilaterals" and "Non-quadrilaterals".

Let's begin by looking at Shape A. What should I do to figure out if Shape A is a quadrilateral or not? Count the sides and count the angles!

- Great! Let's check out Shape A. Count the sides and angles (*give students time*). Is it a quadrilateral? Yes!
- Now let's look at Shape B. Count the sides and angles (*give students time*). Is it a quadrilateral? Yes!
- Now let's look at Shape C. Count the sides and angles (*give students time*). Is it a quadrilateral? No! That's right, Shape C isn't even a polygon because it's not a close figure, all of its sides don't meet.
- You are doing great work so far, let's move to Shape D. Count the sides and angles (*give students time*). Is it a quadrilateral? Yes!

- Look at Shape D and count the sides and angles. Is it a quadrilateral? No, it's a triangle!
- Go ahead and count the sides and angles on Shape E. Is it a quadrilateral? No! Do you know the name of it? Pentagon!
- Now look at F and G and count the sides and angles. Are either quadrilaterals? Shape F is!

You did a great job reasoning with those shapes. Can you remind me, how were we sorting the shapes? How did you know which group the shapes belonged to? Possible Student Answers, Key Points:
- We were sorting the shapes into a group of quadrilaterals and non-quadrilaterals.
- I figured out which group the shapes belonged to by counting the sides and angles.
- The shapes with four sides and four angles were the quadrilaterals.

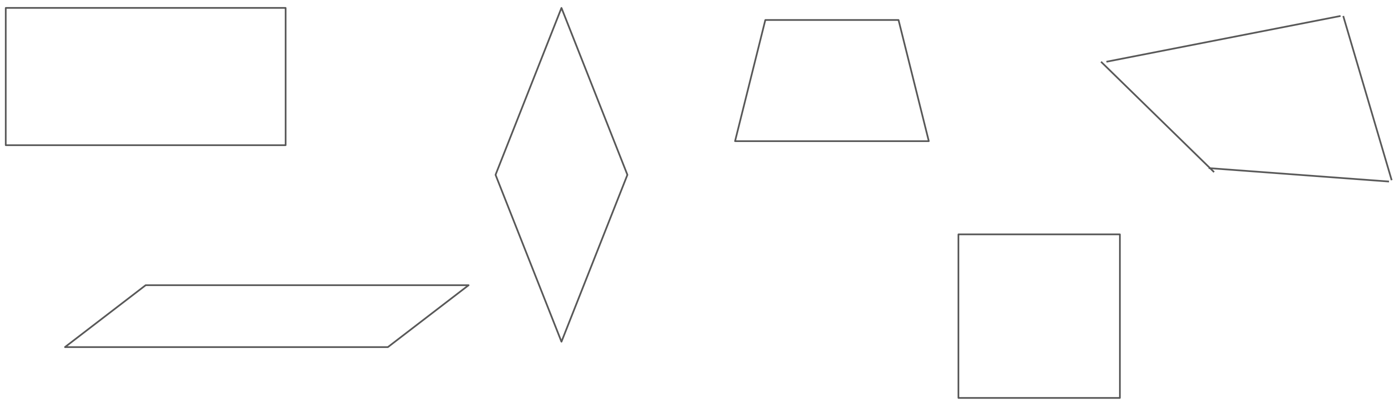
Let's Try it (Slides 5-6): Let's work together on some additional practice with describing, naming, and drawing quadrilaterals. Remember as we work through this together that quadrilaterals are shapes with four sides and four angles. When you are determining whether or not something is a quadrilateral, you can trace the slides to count or circle the angles.

WARM WELCOME

Today we will describe attributes of quadrilaterals.

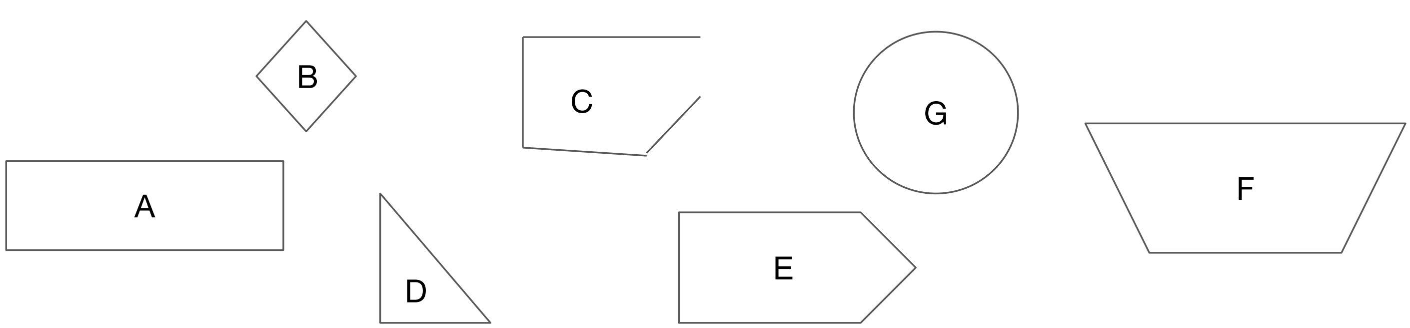
Let’s Talk:

What do all of these shapes have in common?



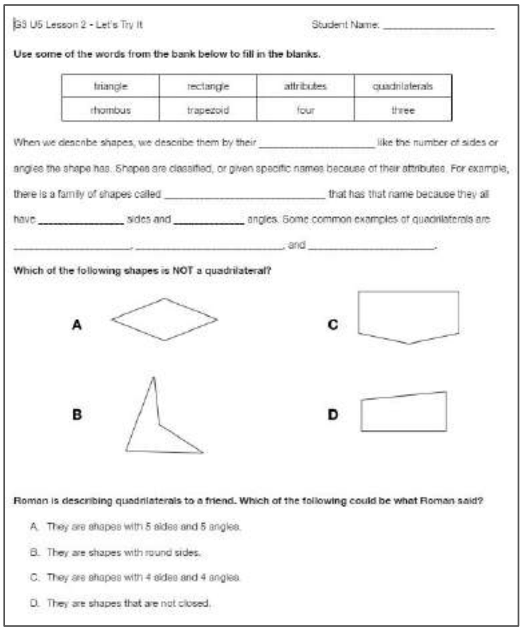
Let’s Think:

Quadrilaterals	Non-quadrilaterals



Let's Try It:

Let's apply our understanding together.



G3 U5 Lesson 2 - Let's Try It Student Name: ____________________

Use some of the words from the bank below to fill in the blanks.

triangle	rectangle	attributes	quadrilaterals
rhombus	trapezoid	four	three

When we describe shapes, we describe them by their ____________________ like the number of sides or angles the shape has. Shapes are classified, or given specific names because of their attributes. For example, there is a family of shapes called ____________________ that has that name because they all have ______________ sides and ____________ angles. Some common examples of quadrilaterals are ____________________, ____________________, and ____________________.

Which of the following shapes is NOT a quadrilateral?

A

B

C

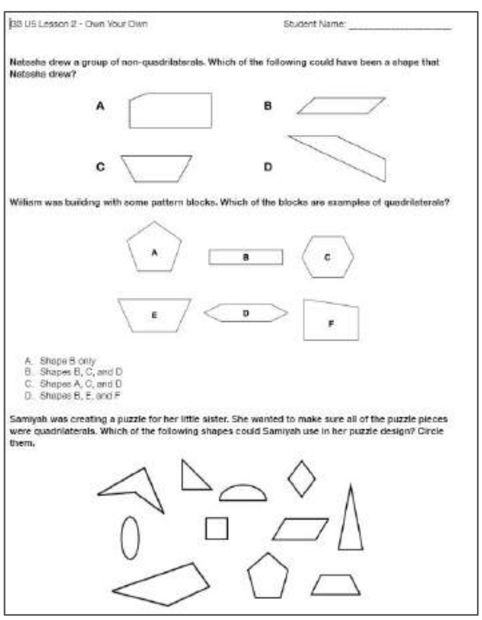
D

Roman is describing quadrilaterals to a friend. Which of the following could be what Roman said?

A. They are shapes with 5 sides and 5 angles.
B. They are shapes with round sides.
C. They are shapes with 4 sides and 4 angles.
D. They are shapes that are not closed.

On your Own:

Apply your understanding about quadrilaterals on your own.



G3 U5 Lesson 2 - Own Your Own Student Name: ____________________

Natasha drew a group of non-quadrilaterals. Which of the following could have been a shape that Natasha drew?

A

B

C

D

William was building with some pattern blocks. Which of the blocks are examples of quadrilaterals?

A. Shape B only
B. Shapes B, C, and D
C. Shapes A, C, and D
D. Shapes B, E, and F

Samiyah was creating a puzzle for her little sister. She wanted to make sure all of the puzzle pieces were quadrilaterals. Which of the following shapes could Samiyah use in her puzzle design? Circle them.

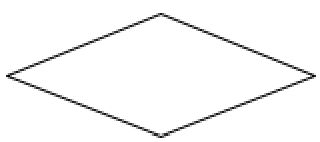
Use some of the words from the bank below to fill in the blanks.

triangle	rectangle	attributes	quadrilaterals
rhombus	trapezoid	four	three

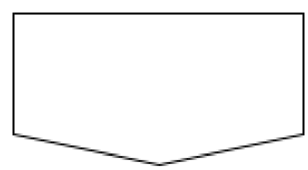
When we describe shapes, we describe them by their ______________________ like the number of sides or angles the shape has. Shapes are classified, or given specific names because of their attributes. For example, there is a family of shapes called _______________________________ that has that name because they all have ________________ sides and _____________ angles. Some common examples of quadrilaterals are ______________________, ____________________________, and ________________________.

Which of the following shapes is NOT a quadrilateral?

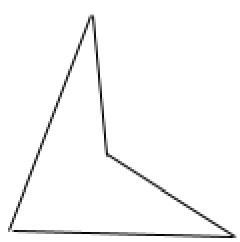
A



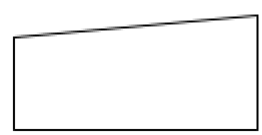
C



B



D



Roman is describing quadrilaterals to a friend. Which of the following could be what Roman said?

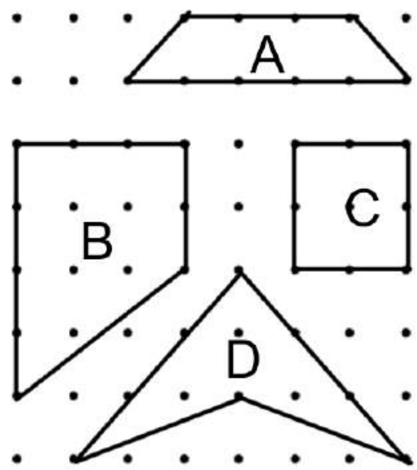
A. They are shapes with 5 sides and 5 angles.

B. They are shapes with round sides.

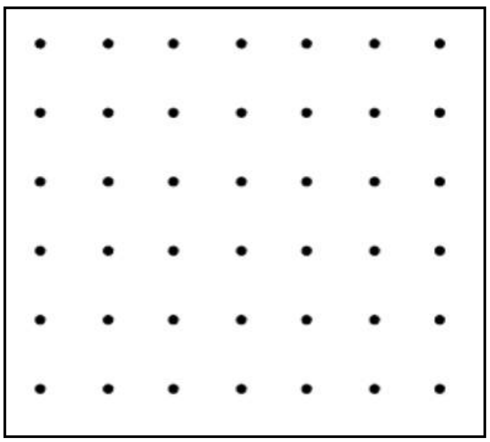
C. They are shapes with 4 sides and 4 angles.

D. They are shapes that are not closed.

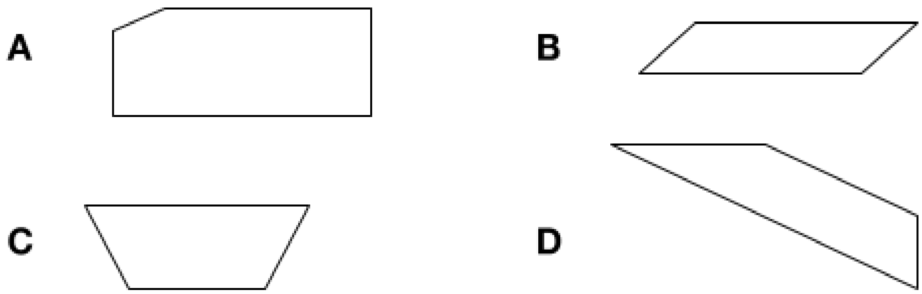
Analyze the shapes below. What attributes do all of the shapes have in common?

	All of the shapes have ______________________ and ____________________________. All of the shapes are _________________________.

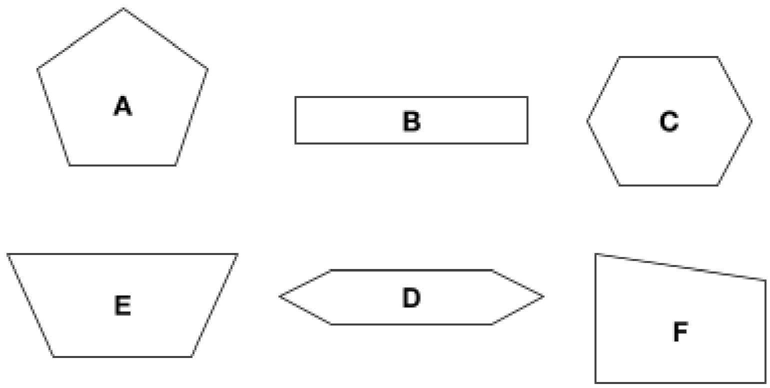
Use the grid below to draw another quadrilateral that is different from Shapes A-D. Remember the attributes that must be true to make it a quadrilateral.



Natasha drew a group of non-quadrilaterals. Which of the following could have been a shape that Natasha drew?

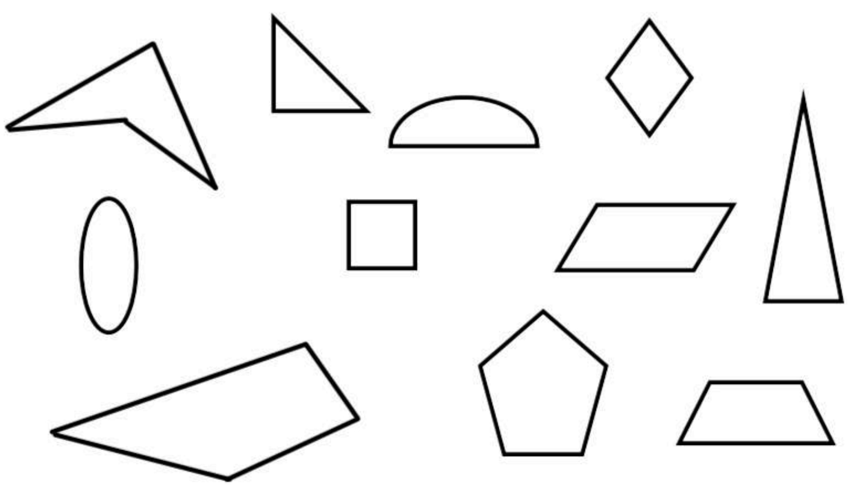


William was building with some pattern blocks. Which of the blocks are examples of quadrilaterals?

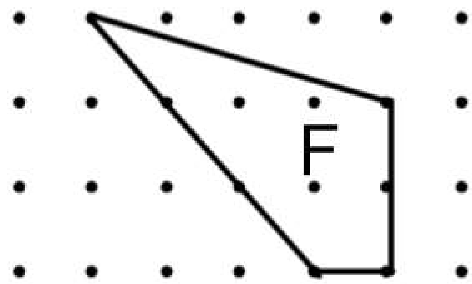


A. Shape B only
B. Shapes B, C, and D
C. Shapes A, C, and D
D. Shapes B, E, and F

Samiyah was creating a puzzle for her little sister. She wanted to make sure all of the puzzle pieces were quadrilaterals. Which of the following shapes could Samiyah use in her puzzle design? Circle them.



Ms. Lee's class was using geoboards and rubber bands to make shapes. Gael made the shape below and presented it to his group, saying it was a quadrilateral. Javion disagreed with Gael. He said, "That is not a quadrilateral because it's not a square, rectangle, rhombus, or trapezoid."



Do you agree with Gael or Javion? Why?

____

____

____

____

Student Name: Answer Key   G3 U5 Lesson 2 - Let's Try It

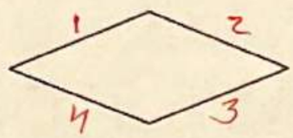
Use some of the words from the bank below to fill in the blanks.

triangle	rectangle	attributes	quadrilaterals
rhombus	trapezoid	four	three

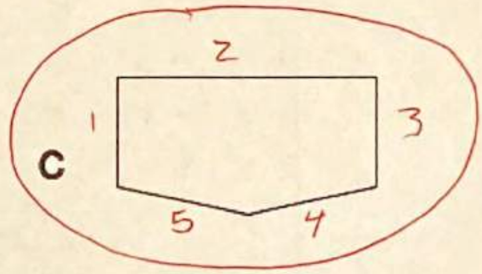
When we describe shapes, we describe them by their attributes like the number of sides or angles the shape has. Shapes are classified, or given specific names because of their attributes. For example, there is a family of shapes called quadrilaterals that has that name because they all have Four sides and Four angles. Some common examples of quadrilaterals are rhombus, trapezoid, and rectangle.

Which of the following shapes is NOT a quadrilateral?

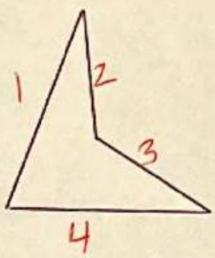
A



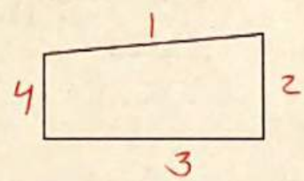
C



B



D



Roman is describing quadrilaterals to a friend. Which of the following could be what Roman said?

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C. They are shapes with 4 sides and 4 angles.

D. They are shapes that are not closed.

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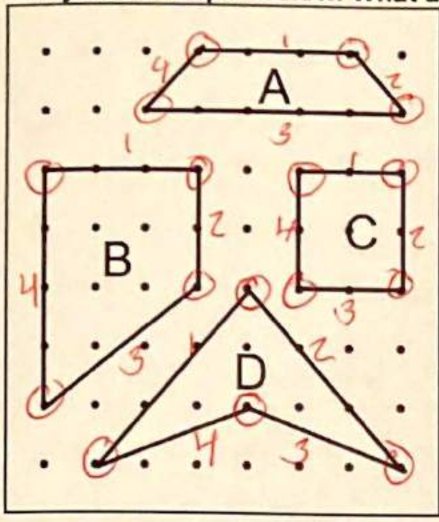
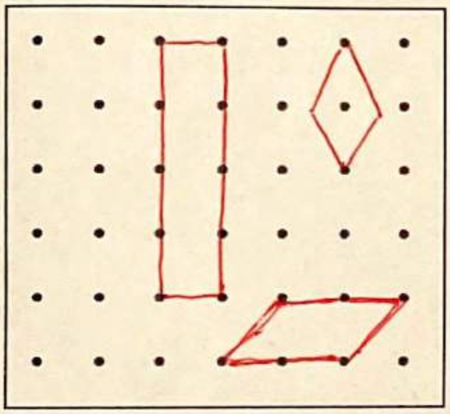


All of the shapes have 4 sides and 4 angles.

All of the shapes are quadrilaterals.

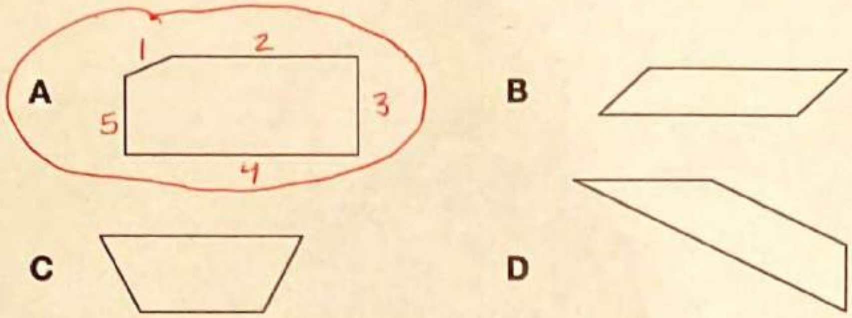
Use the grid below to draw another quadrilateral that is different from Shapes A-D. Remember the attributes that must be true to make it a quadrilateral.



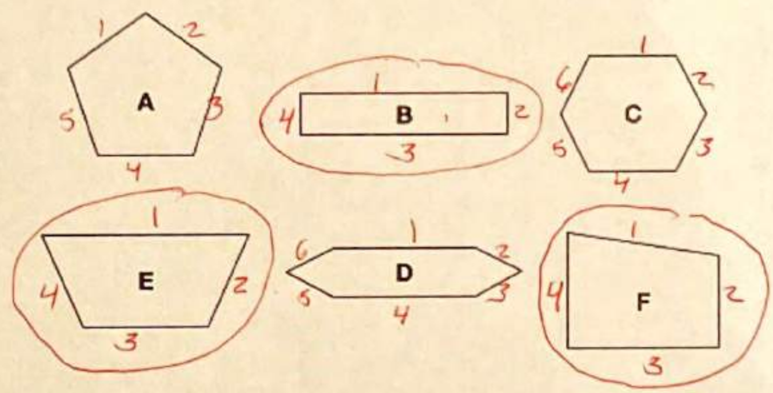
Student Name: Answer Key

G3 U5 Lesson 2 - Independent Work

Natasha drew a group of non-quadrilaterals. Which of the following could have been a shape that Natasha drew?

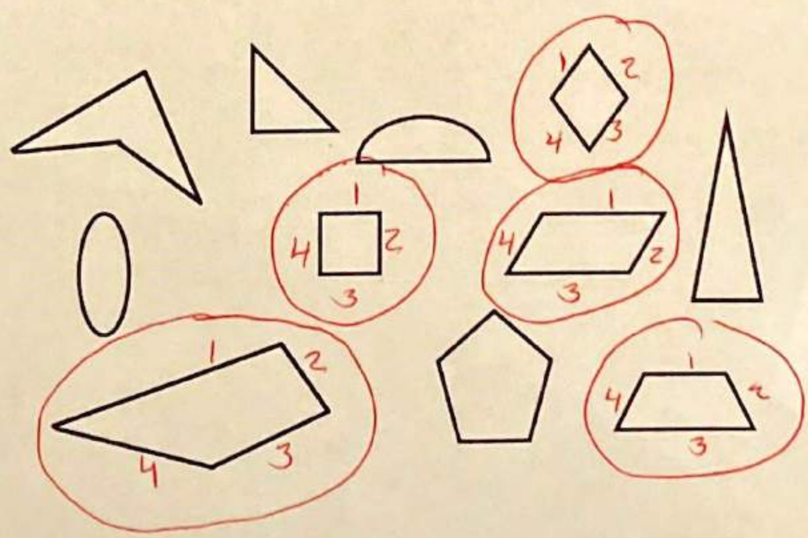


William was building with some pattern blocks. Which of the blocks are examples of quadrilaterals?

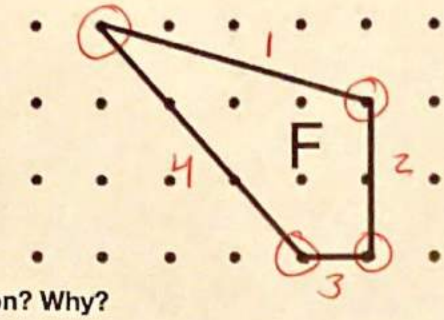


A. Shape B only
B. Shapes B, C, and D
C. Shapes A, C, and D
D. Shapes B, E, and F

Samiyah was creating a puzzle for her little sister. She wanted to make sure all of the puzzle pieces were quadrilaterals. Which of the following shapes could Samiyah use in her puzzle design? Circle them.



Ms. Lee's class was using geoboards and rubber bands to make shapes. Gael made the shape below and presented it to his group, saying it was a quadrilateral. Javion disagreed with Gael. He said, "That is not a quadrilateral because it's not a square, rectangle, rhombus, or trapezoid."



Do you agree with Gael or Javion? Why?

I agree with Gael. This shape is a quadrilateral because it has 4 sides and 4 angles.

G3 U5 Lesson 3

Describe parallelograms and trapezoids

G3 U5 Lesson 3 - Students will describe the attributes of parallelograms and trapezoids.

Tutor Notes: Over the next few lessons, you will be covering the family of quadrilaterals more in depth. A lot of the vocabulary you will be using to describe new attributes will be brand new or unfamiliar to students. Remember to encourage students to use precise terminology as much as possible when describing shapes. In today's lesson you will be taking an in-depth look at parallelograms and trapezoids. These shapes belong in different subcategories of quadrilaterals because parallelograms have two pairs of sides that are parallel to each other, while trapezoids only have one set of parallel sides.

Materials:

- Dot paper

Warm Welcome (Slide 1): Tutor choice.

Frame the Learning/Connect to Prior Learning (Slide 2): The last time we met, we discussed a family of shapes called quadrilaterals. We looked at a lot of examples of quadrilaterals like squares and rectangles, but we also looked at shapes that are simply called quadrilaterals because they have four sides and four angles. Today we are going to investigate two specific types of quadrilaterals, called trapezoids and parallelograms. We are going to learn about the attributes that they have in common but also the attributes that make them different from each other.

Let's Talk (Slide 3): Before we start investigating parallelograms and trapezoids, we are going to investigate the idea of parallel lines. Let's look at the two images of blue and green cars driving on the road. Imagine if the cars continue to drive forward along the road. **Will the cars crash into each other? In which picture? How do you know?** Possible Student Answers, Key Points:

- In Example A, the cars are going to crash. I know because if the blue car keeps driving on that road, the road is going to run into where the green car is driving.
- In Example B, the cars will not crash into each other while they are driving. The roads will not cross each other, so the cars will not crash.

You are absolutely right. The cars in Example B will never crash into each other, even if they keep driving on those roads forever. That is because the roads are parallel to each other. They can extend on and on forever, but they are never going to cross each other.

Let's Talk (Slide 4): So as we just saw in our examples about the cars driving on the roads, parallel lines are lines that will never, ever, ever intersect even though they continue on forever. Let's look at some examples on the screen.

Notice Set A. The lines in set A intersect or touch. That means that they are not parallel lines. Now let's look at Set B. **What are you noticing about Set B?** Possible Student Answers, Key Points:

- Set B is not parallel. If you stretch out the lines further, they will intersect or touch.
- They aren't touching in the picture but if they keep going they'll touch eventually.
- *Note: If the students struggle to recognize that the lines are not parallel because they are not actually touching in the image, remind students that lines stretch on forever, so if we imagine stretching out the lines, we can see that they will intersect or run into each other.*

Great job, you're right that Set B isn't parallel because eventually, if we extend those lines they will cross or intersect. Now, let's take a look at Set C. Imagine stretching out the lines in Set C, like it's a road that two cars are driving on. **What do you think?** Possible Student Answers, Key Points:

- The lines in set C are parallel because even when we stretch them out, they will not intersect.
- If those lines keep going forever, they'll never cross.

You are absolutely right, those lines are never going to touch, even when we extend them. **What do you notice about the lines in Set D?** Possible Student Answers, Key Points:

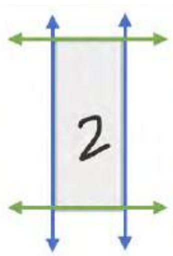
- The lines in set D are parallel too because even when we stretch them out, they will not intersect.

Two more to go. Let's look at the lines in Set E. Remember to stretch the lines out to test whether or not they are parallel. **So, are the lines in Set E parallel, yes or no**? No! Why? Because they'll never intersect! Great work. Last one. **Talk to me about the lines in Set F.** Possible Student Answers, Key Points:

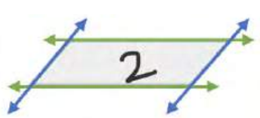
- The lines in set F are examples of parallel lines because they will never, ever intersect even when they stretch out forever.

Awesome job working to identify those sets of lines as parallel or not parallel. We can use the same strategy of stretching out or extending sides in shapes to check to see if the sides of the shape are parallel to each other or not. And if we're struggling, we can always imagine that the blue car and green car are driving on our lines and decide whether they'll crash into each other or not. Remember to test your cars in BOTH directions to check!

Let's Talk (Slide 5): Let's look at the sets of shapes on the screen. Even though trapezoids and parallelograms are in different families, they do share some attributes. **What can we say is the same about all of the parallelograms and trapezoids?** They all have four sides and four angles. They are all quadrilaterals! That's right, parallelograms and trapezoids are both types of quadrilaterals because they both have 4 sides and 4 angles. **But, what's different about them?** Hmm, let's explore that together by looking closely at which shapes have sets of parallel lines and how many.

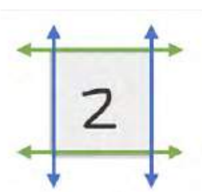


We know that parallel lines will never, ever intersect, like we talked about with the blue and green cars! So let's use that understanding to check to see if any of the sides of the rectangle are parallel to each other. I'm going to trace the lines and extend the sides of the rectangle out to show that even when stretched on, the lines will never intersect. So I'm seeing that a rectangle actually has two pairs of parallel sides - the sides are parallel and the top and bottom are parallel–let me label how many SETS of parallel lines this shape has. I wonder if that's true for the other shapes on the parallelogram side.



Now let's look at this shape! Let's use our colors to check if the rhombus has parallel lines! There are two pairs of parallel sides in the rhombus, too. Let's label that!

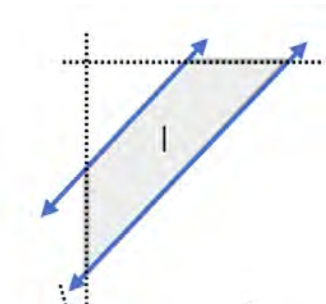
Now let's take a look at this quadrilateral.How many sets of parallel lines does this shape have? 2! Let's go ahead and label, are you starting to see a pattern with all of the parallelograms?



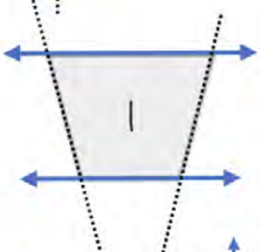
Finally, let's check the square! How many sets of parallel lines do we see here? Two!

Oh, interesting! So all of the shapes that are parallelograms have 4 angles, 4 sides, AND two sets of parallel lines. Let's investigate the trapezoids and see if that is the same or different.

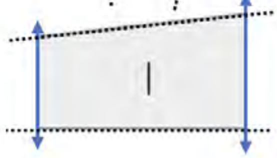
What should I do to check for pairs of parallel sides? Stretch out the sides. Use your pencil to extend the sides to see if they will touch.



Let's start with this shape. I see that the top and bottom are parallel but the sides aren't parallel, look if we extend them they'll cross. So this shape as ONE set of parallel lines, let's label that.



Now let's look at this shape, I see the top and bottom are parallel but the sides aren't quite parallel, look if cars travel down these two roads, eventually they'll crash into each other. So this shape also only has ONE set of parallel lines, let's label that too.



Last one! This one, the sides are parallel to each other but the top and bottom aren't quite parallel, if cars keep going on these roads, eventually they'll crash!

So, all of the shapes that are labeled trapezoid have 4 sides, 4 angles, and ONE set of parallel lines.

Let's Think (Slide 7): So, today we found out that parallelograms and trapezoids are both in the quadrilateral family, but they aren't exactly the same. It's sort of like how you and your cousins are in the same family, but you don't have the same parents and you're not exactly the same. You might look alike, maybe you have the same eye or hair color, but you also have differences, just like the parallelograms and trapezoids.

Let's Try it (Slide 8): Today we worked together to identify the main difference in the attributes of parallelograms versus trapezoids. Parallelograms have two pairs of parallel sides and the trapezoid family only has one pair of parallel sides. Remember while we practice, we can extend or stretch out the sides of the shapes with a pencil or a marker to check to see if they will intersect, and we can think about those blue and green cars driving along the sides of the shapes to see if they will crash. Let's practice our understanding of the similarities and differences between parallelograms and trapezoids together.

WARM WELCOME

Today we will describe the attributes of parallelograms and trapezoids.

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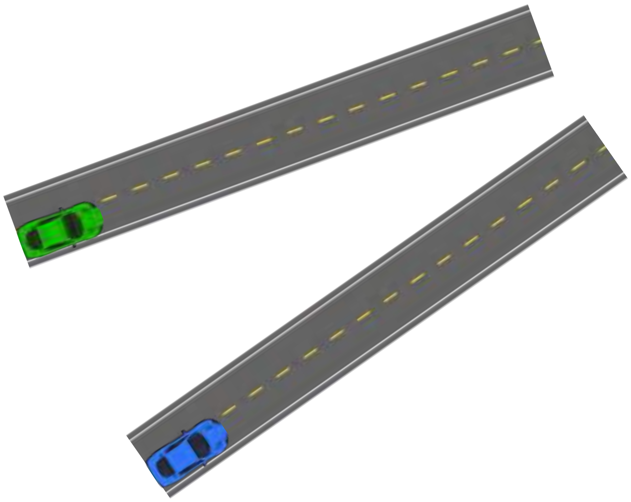
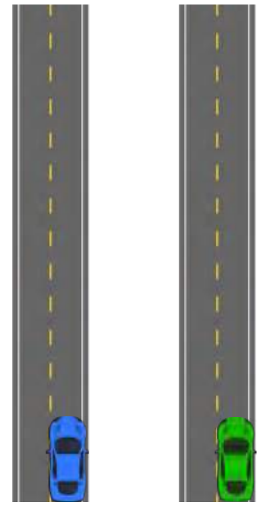
Let’s Talk:

Imagine the green car and blue car are traveling together on the roads. If they continue driving, would they crash why or why not?

Example A

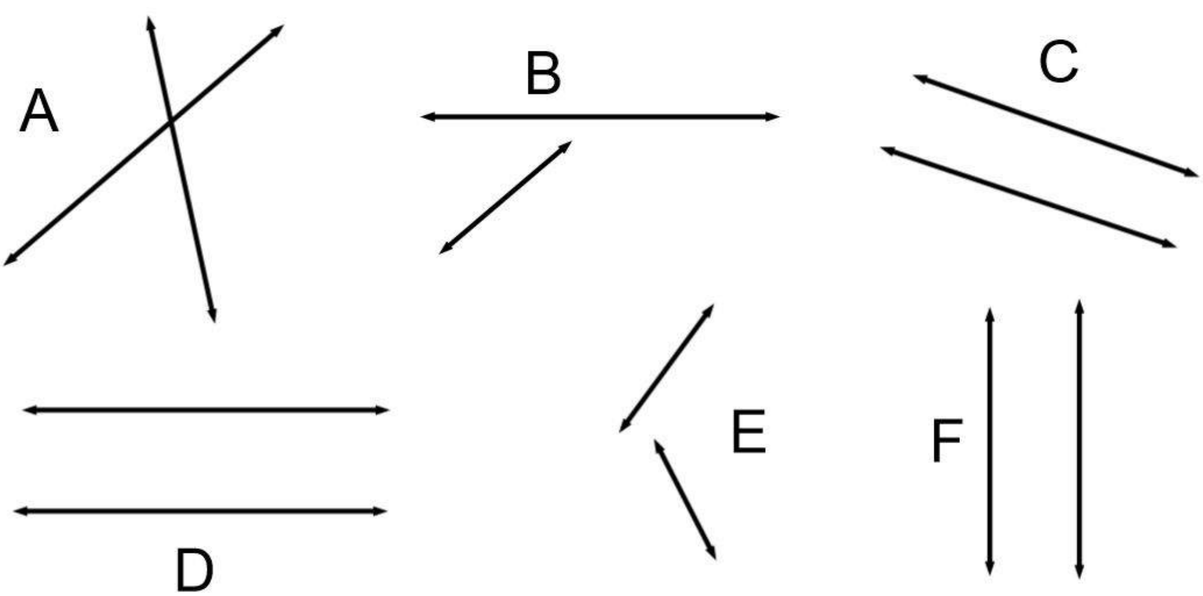


Example B



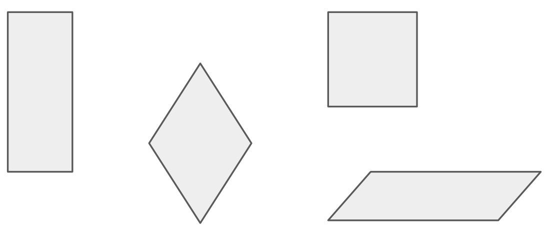
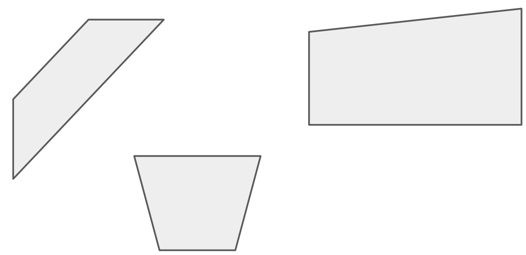
Let’s Talk:

Parallel or not parallel?

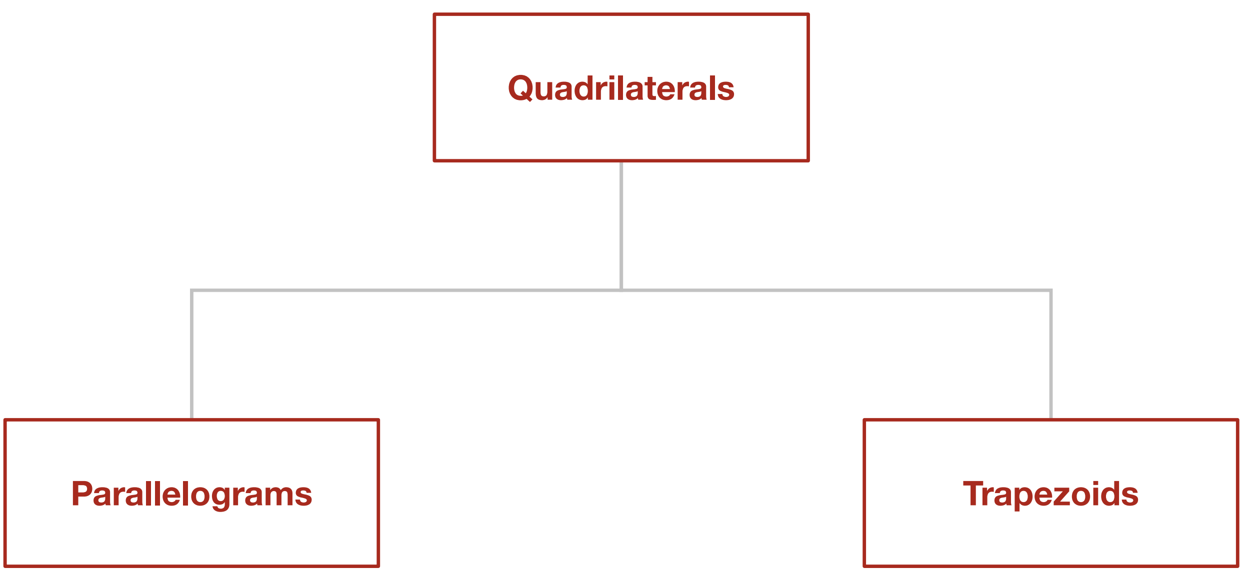


Let's Think:

What is the **same** about both parallelograms and trapezoids? What is **different**?

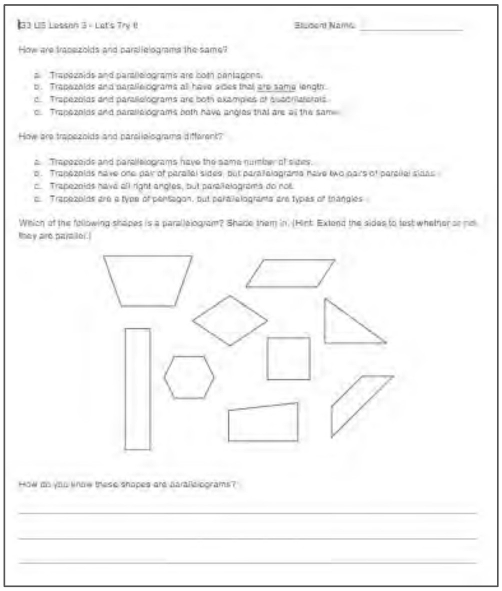
Parallelograms	Trapezoids
	

Let's Think:



Let's Try It:

Let's apply our understanding together.


G3 U5 Lesson 3 - Let's Try It

Student Name: ____________

How are trapezoids and parallelograms the same?

a. Trapezoids and parallelograms are both pentagons.
b. Trapezoids and parallelograms all have sides that are same length.
c. Trapezoids and parallelograms are both examples of quadrilaterals.
d. Trapezoids and parallelograms both have angles that are all the same.

How are trapezoids and parallelograms different?

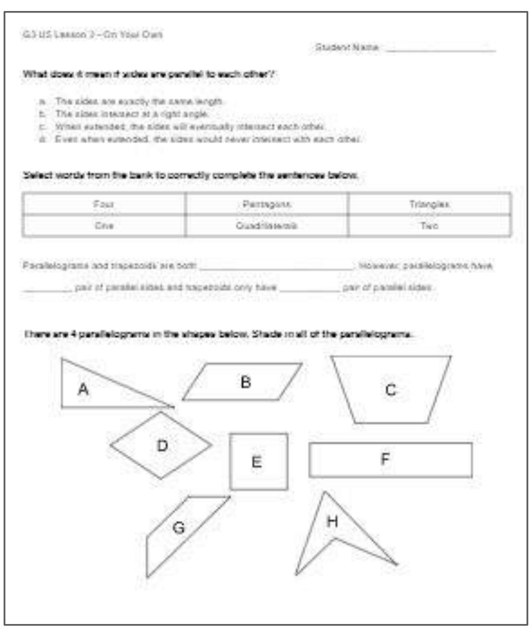
a. Trapezoids and parallelograms have the same number of sides.
b. Trapezoids have one pair of parallel sides, but parallelograms have two pairs of parallel sides.
c. Trapezoids have all right angles, but parallelograms do not.
d. Trapezoids are a type of pentagon, but parallelograms are types of triangles.

Which of the following shapes is a parallelogram? Shade them in. (Hint: Extend the sides to test whether or not they are parallel.)

How do you know these shapes are parallelograms?

On your Own:

Let's try on our own.


G3 U5 Lesson 3 – On Your Own

Student Name: ____________

What does it mean if sides are parallel to each other?

a. The sides are exactly the same length.
b. The sides intersect at a right angle.
c. When extended, the sides will eventually intersect each other.
d. Even when extended, the sides would never intersect with each other.

Select words from the bank to correctly complete the sentences below.

Four	Pentagons	Triangles
One	Quadrilaterals	Two

Parallelograms and trapezoids are both ____________. However, parallelograms have ______ pair of parallel sides and trapezoids only have ______ pair of parallel sides.

There are 4 parallelograms in the shapes below. Shade in all of the parallelograms.

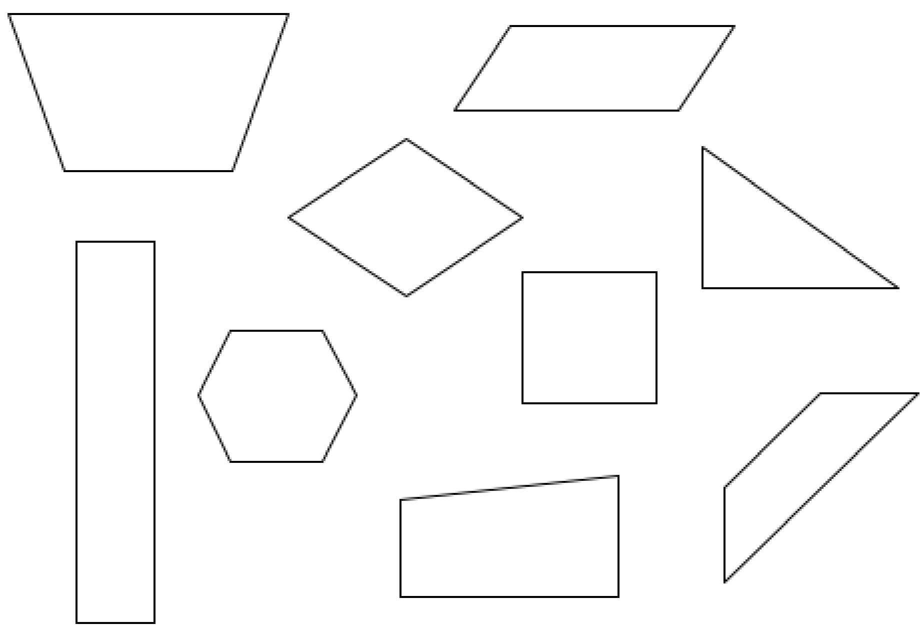
How are trapezoids and parallelograms the same?

a. Trapezoids and parallelograms are both pentagons.
b. Trapezoids and parallelograms all have sides that are the same length.
c. Trapezoids and parallelograms are both examples of quadrilaterals.
d. Trapezoids and parallelograms both have angles that are all the same.

How are trapezoids and parallelograms different?

a. Trapezoids and parallelograms have the same number of sides.
b. Trapezoids have one pair of parallel sides, but parallelograms have two pairs of parallel sides.
c. Trapezoids have all right angles, but parallelograms do not.
d. Trapezoids are a type of pentagon, but parallelograms are types of triangles.

Which of the following shapes are parallelograms? Shade them in. (Hint: Extend the sides to test whether or not they are parallel.)



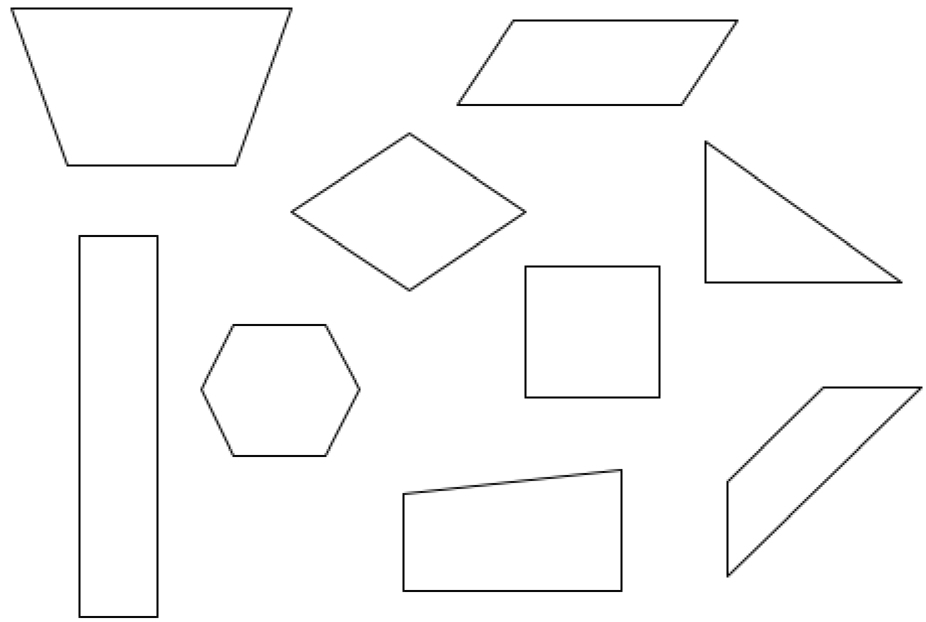
How do you know these shapes are parallelograms?

____

____

____

Which of the following shapes are trapezoids? Shade them in. (Hint: Extend the sides to test whether or not they are parallel.)



How do you know these shapes are trapezoids?

Name: ______________________________________ G3 U5 Lesson 3 - Independent Work

What does it mean if sides are parallel to each other?

a. The sides are exactly the same length.
b. The sides intersect at a right angle.
c. When extended, the sides will eventually intersect each other.
d. Even when extended, the sides would never intersect with each other.

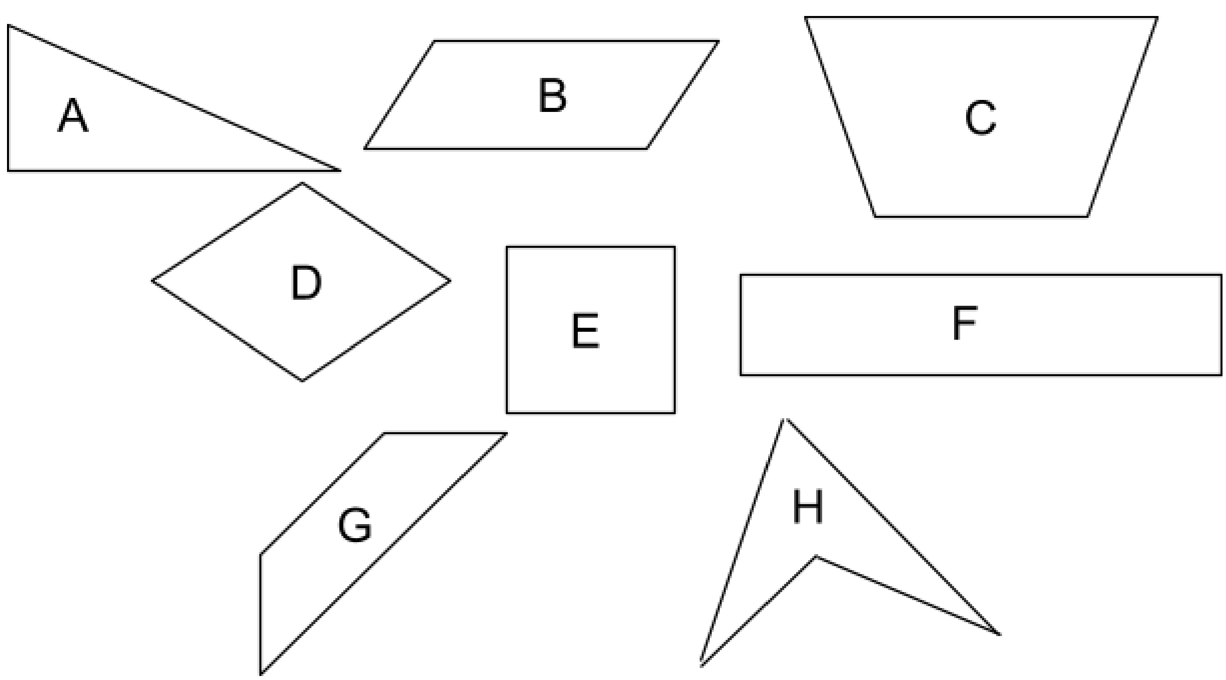
Select words from the bank to correctly complete the sentences below.

Four	Pentagons	Triangles
One	Quadrilaterals	Two

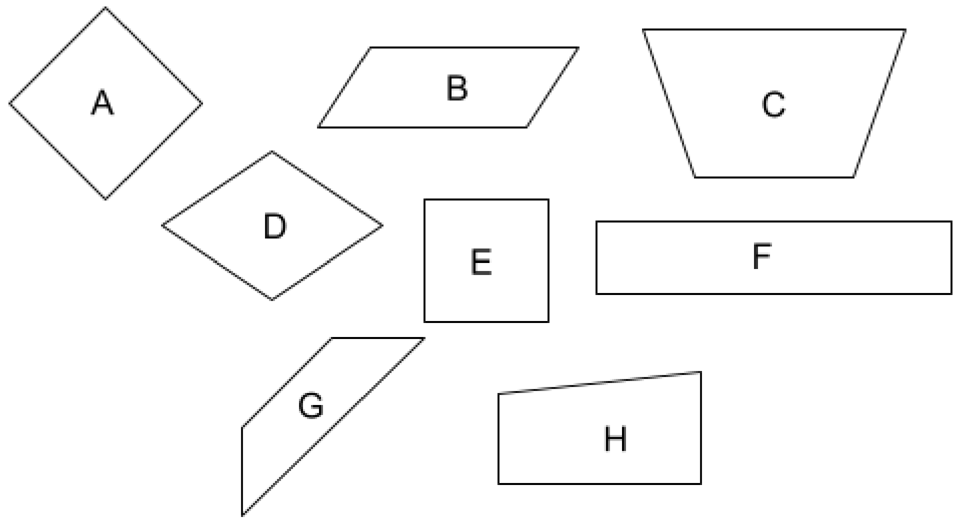
Parallelograms and trapezoids are both ________________________. However, parallelograms have

________ pair of parallel sides and trapezoids only have __________ pair of parallel sides.

There are 4 parallelograms in the shapes below. Shade in all of the parallelograms.



Meredith is looking at the set of shapes below. She cannot figure out if Shape H is just a quadrilateral, or if it is a parallelogram, or a trapezoid. Show Meredith how to figure out what type of shape H is and then tell Meredith the correct name of the shape.



Sort the shapes above into the correct category.

Trapezoids	Parallelograms

Name: Answer Key

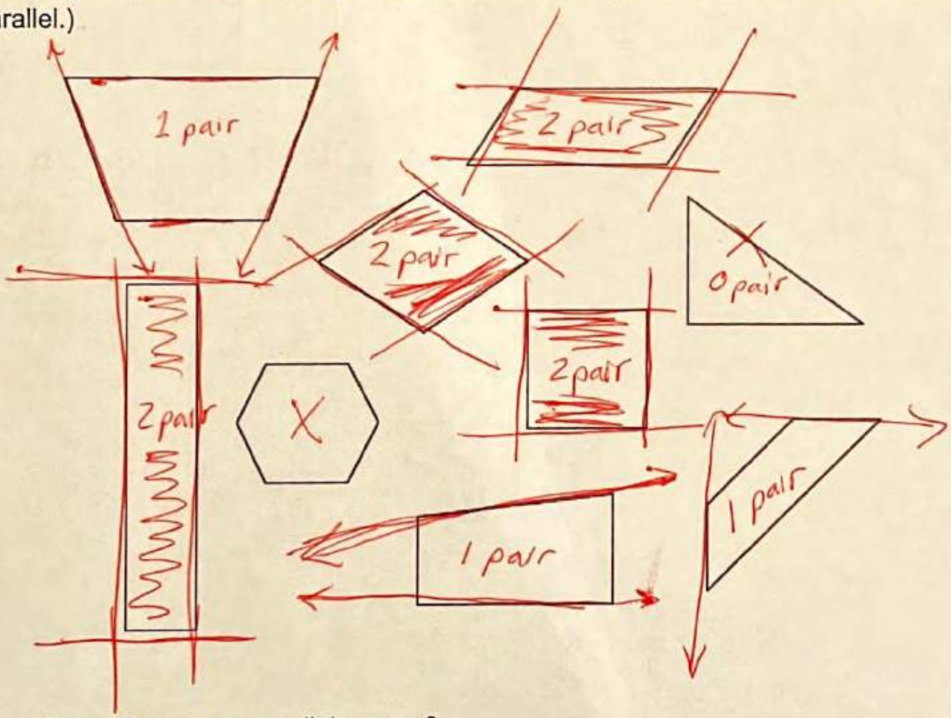
How are trapezoids and parallelograms the same?

a. Trapezoids and parallelograms are both pentagons.
b. Trapezoids and parallelograms all have sides that are the same length.
c. Trapezoids and parallelograms are both examples of quadrilaterals.
d. Trapezoids and parallelograms both have angles that are all the same.

How are trapezoids and parallelograms different?

a. Trapezoids and parallelograms have the same number of sides.
b. Trapezoids have one pair of parallel sides, but parallelograms have two pairs of parallel sides.
c. Trapezoids have all right angles, but parallelograms do not.
d. Trapezoids are a type of pentagon, but parallelograms are types of triangles.

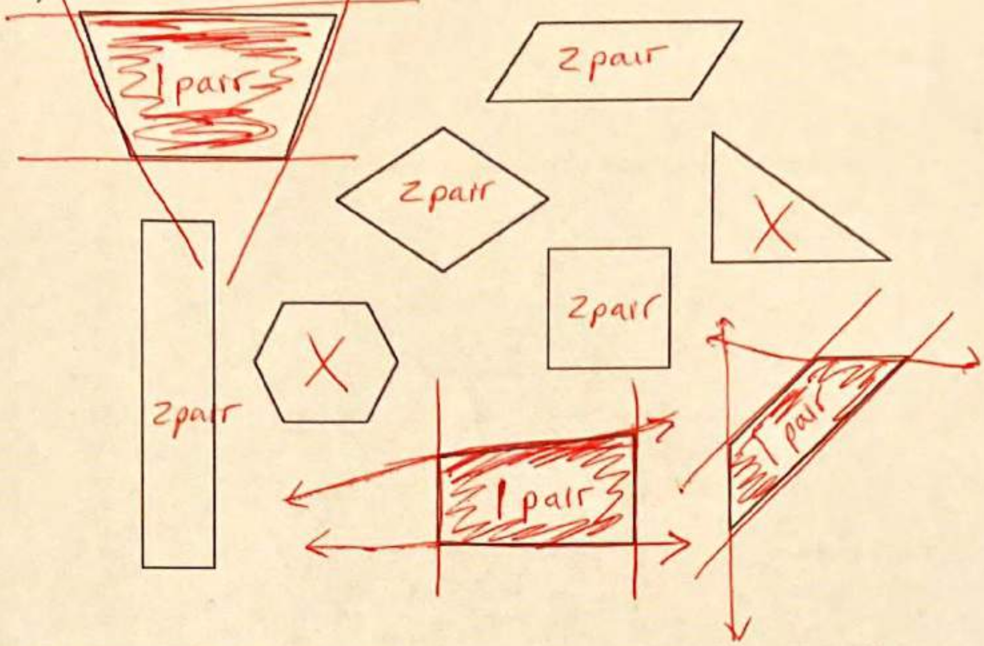
Which of the following shapes are parallelograms? Shade them in. (Hint: Extend the sides to test whether or not they are parallel.)



How do you know these shapes are parallelograms?

These shapes are parallelograms because they are quadrilaterals with two pairs of parallel sides.

Which of the following shapes are trapezoids? Shade them in. (Hint: Extend the sides to test whether or not they are parallel.)



How do you know these shapes are trapezoids?

These shapes are trapezoids because they're quadrilaterals with only one pair of parallel sides.

Name: Answer Key

What does it mean if sides are parallel to each other?

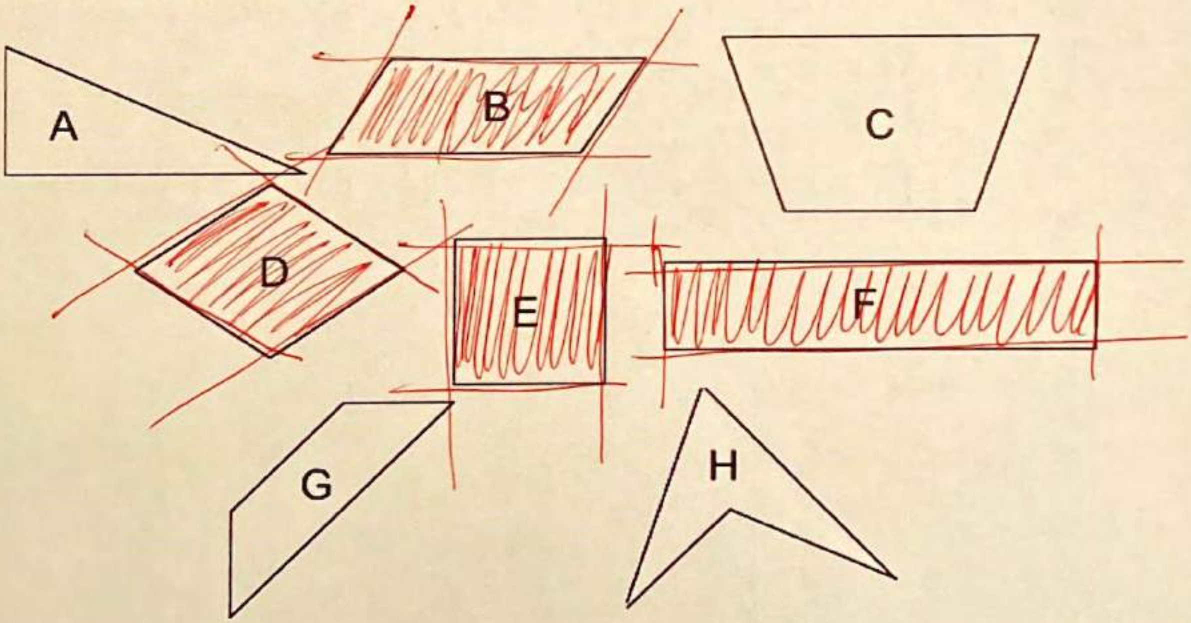
a. The sides are exactly the same length.
b. The sides intersect at a right angle.
c. ~~When extended, the sides will eventually~~ intersect each other.
d. Even when extended, the sides would never intersect with each other.

Select words from the bank to correctly complete the sentences below.

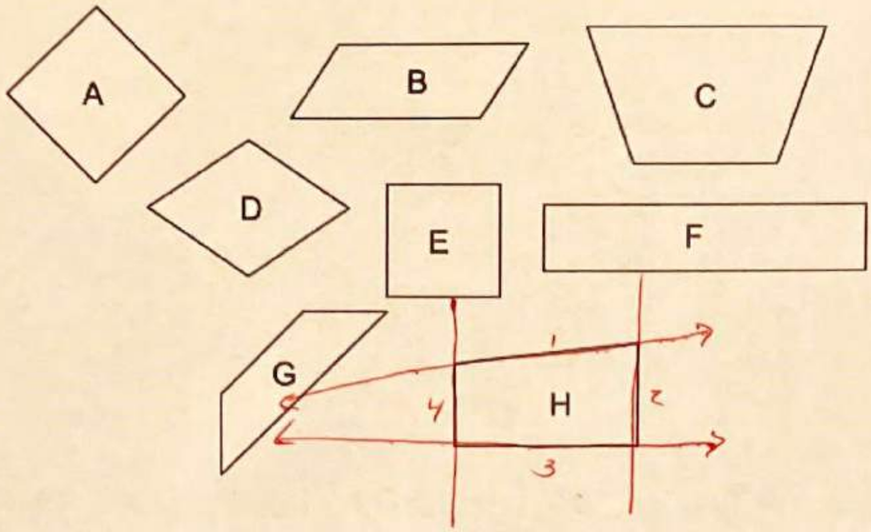
Four	Pentagons	Triangles
One	Quadrilaterals	Two

Parallelograms and trapezoids are both quadrilaterals. However, parallelograms have two pair of parallel sides and trapezoids only have one pair of parallel sides.

There are 4 parallelograms in the shapes below. Shade in all of the parallelograms.



Meredith is looking at the set of shapes below. She cannot figure out if Shape H is just a quadrilateral, or if it is a parallelogram, or a trapezoid. Show Meredith how to figure out what type of shape H is and then tell Meredith the correct name of the shape.



The correct name of shape H is trapezoid. It has four sides, and when you extend the sides, you can tell the top and bottom will intersect, so there is only one pair of parallel sides.

Sort the shapes above into the correct category.

Trapezoids	Parallelograms
C G H	A B D E F

G3 U5 Lesson 4

Describe rectangles

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G3 U5 Lesson 4 - Students will describe the attributes of rectangles

Tutor Notes: Today, students will learn about a number of shapes that fall into the parallelogram family. It is important for students to understand the attributes that qualify shapes into certain categories. For example, all parallelograms are quadrilaterals because they have four sides, but they are specifically named parallelograms because they have two pairs of parallel sides. In today's lesson, students will learn about a specific type of parallelogram, the rectangle. A rectangle is classified by having four right angles. There is also an important distinction between rectangles and squares, in which a rectangle has opposite sides congruent while a square has all four sides congruent, but we will explore that specific nuance in a later lesson. Today we will focus on identifying types of angles in the shape to justify naming shapes within the parallelogram family as rectangles.

Warm Welcome (Slide 1): Tutor choice.

Let's Review (Slide 2): We've been working with flat, 2D, shapes and using their attributes to describe them. Yesterday we looked closely at the sides to help us classify quadrilaterals as parallelograms and trapezoids. Today, we'll be looking closely at angles. Remember, angles are formed where two sides meet (*point to angles*).

Frame the Learning/Connect to Prior Learning (Slide 3): The last time we met, we dug deeper into the family of quadrilaterals by analyzing trapezoids and parallelograms. Today we are going to continue that work by looking at a specific kind of parallelogram, the rectangle. Raise your hand if you've heard of a rectangle before. Oh, I see lots of you have heard of a rectangle. Today, we're going to learn the exact attributes that make a rectangle, a rectangle!

Let's Talk (Slide 4): Here we have two objects that probably look familiar to you, an eraser and a gift box. Take a look at the side of each object. **What do you notice about the sides of these objects? What is similar? What is different?** Possible Student Answers, Key Points:

- Both of them have four sides. Both of them have four angles.
- The side of the eraser is slanted but the side of the box is straight.
- The box has straight edges (or square corners) but the eraser doesn't.

Great noticings! You mentioned a few ideas about the eraser being "tilted" or "slanted" while the box is "straight". Those noticings are exactly what we are going to be talking about today when we learn about angles in shapes.

Let's Think (Slide 5): To better understand what makes rectangles unique, we need to first understand the types of angles that we see in shapes. Remember angles are formed where two sides of the shape meet, and that the number of angles is an important attribute of shapes, but we also need to understand the types of angles that the shape has to better classify the shape. There are 3 types of angles, right angles, acute angles, and obtuse angles. I'll show you an example of each one.

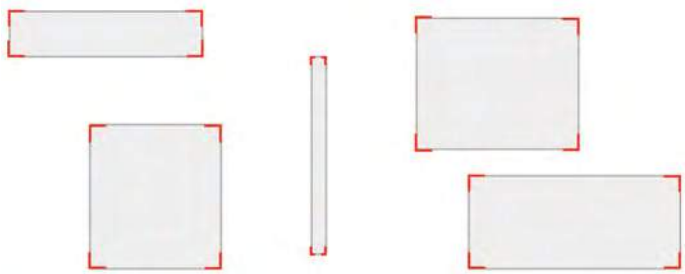
Right angles form a perfect capital L, measuring 90 degrees. You can also imagine the corner of a piece of paper to help you visualize a right angle. Everyone show me a perfect right angle with your arm/elbow.

Let's Talk (Slide 6): Some angles are also called acute angles, which are smaller than the perfect capital L, measuring less than 90 degrees. Show me an acute angle with your arm/elbow.

Note: If students have trouble seeing how this is different from a right angle, draw an L to show how it is more closed than a right angle.

Let's Talk (Slide 7): And finally, we have obtuse angles, which are larger, or more open, than the perfect capital L, measuring more than 90 degrees. Everyone show me an obtuse angle with your arm/elbow.

Let's Think (Slide 8): Let's think about what we just learned about angles. Take a look at the quadrilaterals on the screen–they are ALL rectangles. **What do you notice about the angles in the rectangles?** All of the angles in the rectangles are right angles.



That's right, we see that every shape on here has FOUR right angles!

So, when you were noticing earlier that the side of the gift box was straight or had square corners, you were actually noticing the fact that the side of the box has right angles!

So based on what we have learned so far together about quadrilaterals and special shapes within the quadrilateral family, what do you think are the attributes of a rectangle? Rectangles have to have four sides **and** four right angles. They also have two pairs of parallel sides. That's right, these are special parallelograms called rectangles and they're rectangles because they have four right angles, that perfect L!

Note: It is important for students to understand that the attribute of "4 sides" classifies rectangles as quadrilaterals, "two pairs of parallel sides" classifies it as a parallelogram, but the four right angles classify them even more specifically as rectangles.

You did a great job reasoning with what makes rectangles a special subgroup of parallelograms! Rectangles have four right angles in addition to having two pairs of parallel sides and four sides.

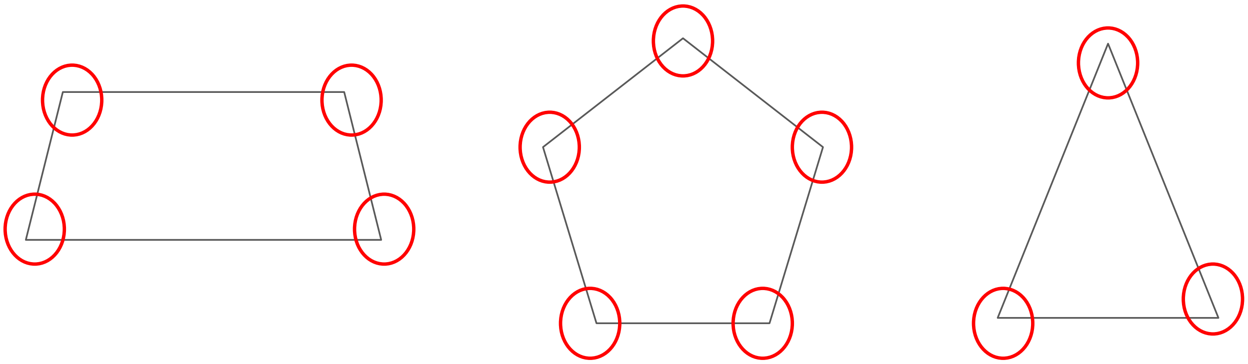
Let's Talk (Slide 9): We are growing our family of quadrilaterals! Last lesson we talked about how parallelograms and trapezoids are kind of like cousins in the quadrilateral family. Today, we discovered that rectangles are kind of like the child of a parallelogram. It shares all the same traits as the parallelogram, but it also has its own attribute that makes it special, just like you might have a lot in common with your parents, but you also have things about you that make you unique and special.

Let's Try it (Slides 10-11): Let's practice our understanding about the attributes of rectangles together. Remember as we work through our practice, we are going to be checking the types of angles that we see in the shapes. Rectangles have all right angles, so we will be looking for the angles that form a perfect capital L shape. We can even use a corner of a piece of paper to help us check the angles.

WARM WELCOME

Let's Review:

Angles are formed where two sides meet.



Today we will describe the attributes of rectangles.

Let's Talk:

Think about the side of the eraser compared to the side of the gift box.

- **What is similar?**
- **What is different?**

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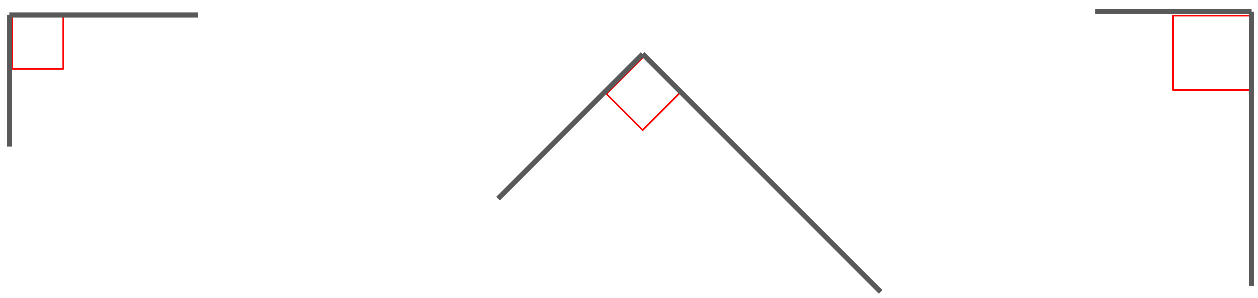
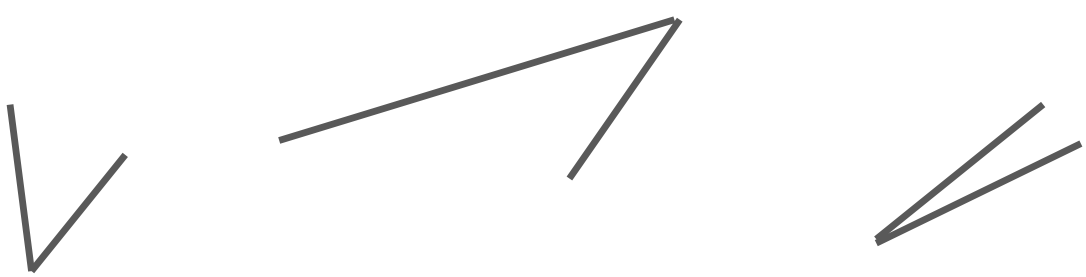
Let's Think:

Right Angles: Angles that measure 90 degrees and form a perfect "L"



Let's Think:

Acute Angles: Angles that measure less 90 degrees, smaller than the perfect "L"



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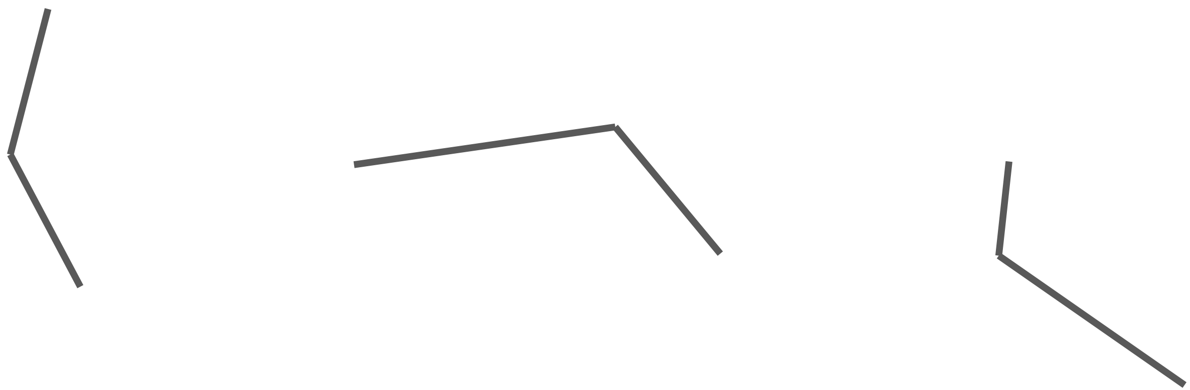
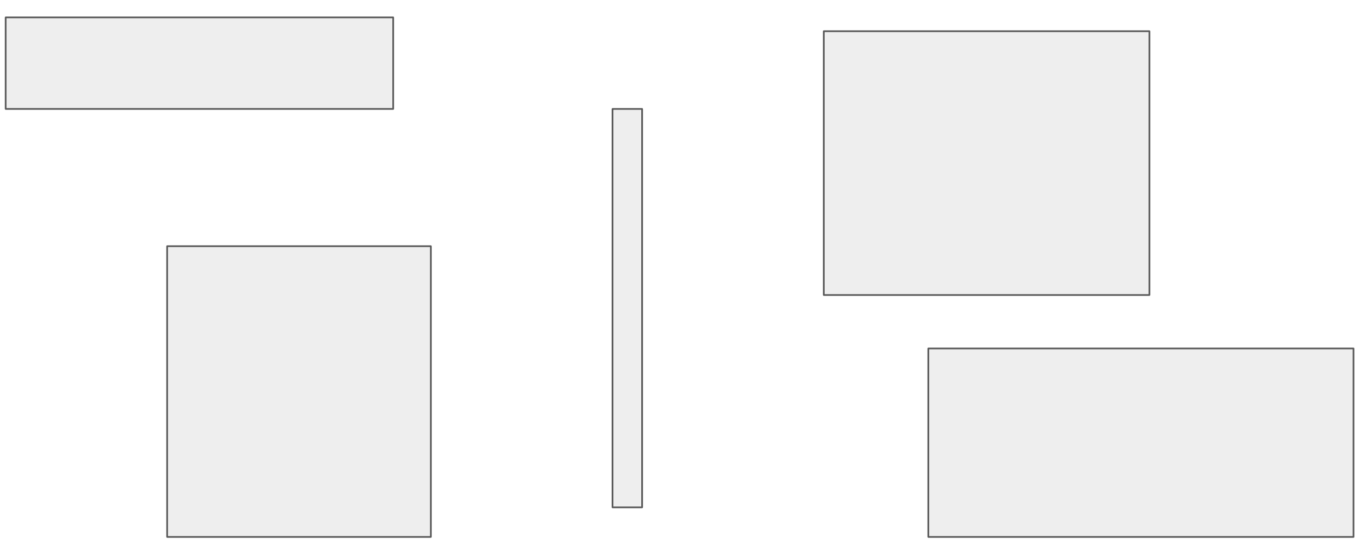
Let's Think:

Obtuse angles: Angles that measure more than 90 degrees, larger than the perfect "L"



Let's Think:



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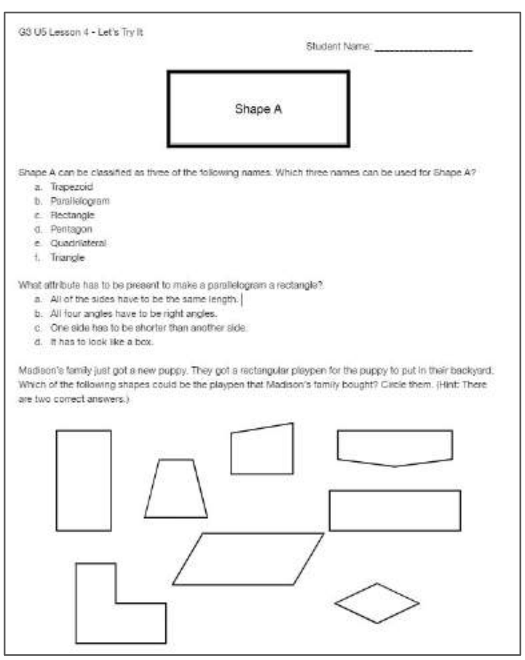
Let's Think:

- **Quadrilaterals**
  - **Parallelograms**
    - **Rectangles**
  - **Trapezoids**

Let's Try It:

Let's apply our understanding together.



G3 U5 Lesson 4 - Let's Try It

Student Name: ________________

Shape A

Shape A can be classified as three of the following names. Which three names can be used for Shape A?

a. Trapezoid
b. Parallelogram
c. Rectangle
d. Pentagon
e. Quadrilateral
f. Triangle

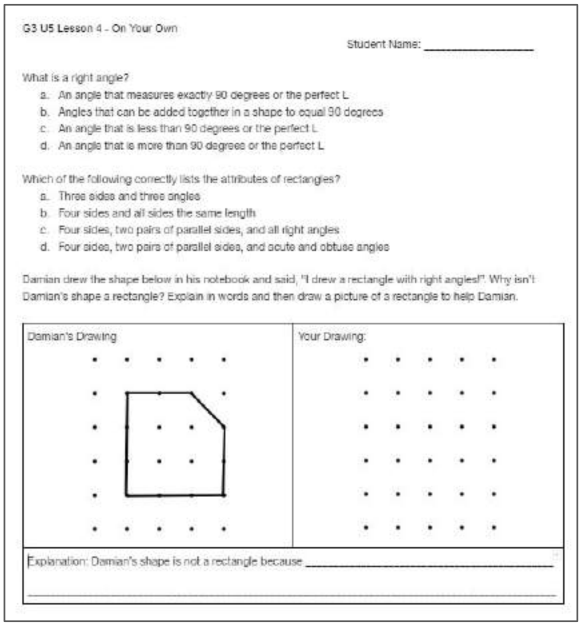
What attribute has to be present to make a parallelogram a rectangle?

a. All of the sides have to be the same length.
b. All four angles have to be right angles.
c. One side has to be shorter than another side.
d. It has to look like a box.

Madison's family just got a new puppy. They got a rectangular playpen for the puppy to put in their backyard. Which of the following shapes could be the playpen that Madison's family bought? Circle them. (Hint: There are two correct answers.)

On your Own:

Let’s try on our own.


G3 U5 Lesson 4 - On Your Own

Student Name: ________________

What is a right angle?

a. An angle that measures exactly 90 degrees or the perfect L
b. Angles that can be added together in a shape to equal 90 degrees
c. An angle that is less than 90 degrees or the perfect L
d. An angle that is more than 90 degrees or the perfect L

Which of the following correctly lists the attributes of rectangles?

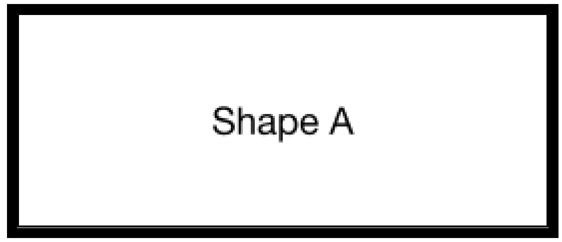
a. Three sides and three angles
b. Four sides and all sides the same length
c. Four sides, two pairs of parallel sides, and all right angles
d. Four sides, two pairs of parallel sides, and acute and obtuse angles

Damian drew the shape below in his notebook and said, "I drew a rectangle with right angles!" Why isn't Damian's shape a rectangle? Explain in words and then draw a picture of a rectangle to help Damian.

Damian's Drawing	Your Drawing:

Explanation: Damian's shape is not a rectangle because ____

____



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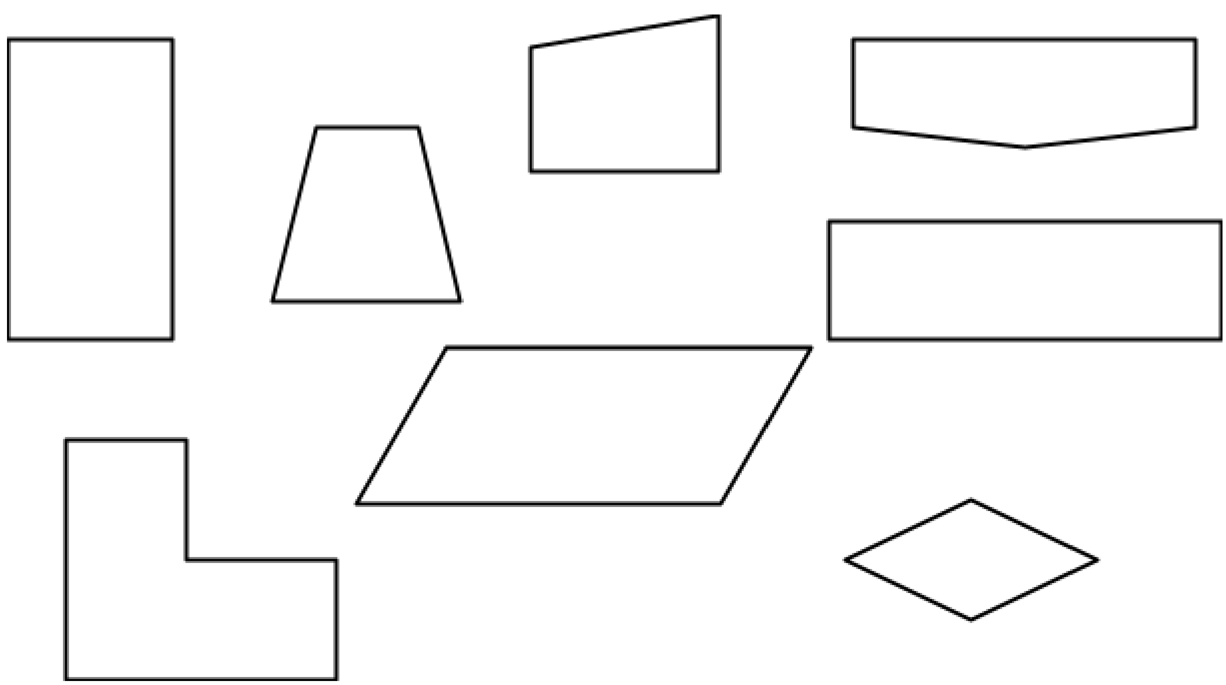

Use the dot grid below to draw **two examples of rectangles** and **two other quadrilaterals** that are **not** rectangles.

Rectangles	Other quadrilaterals

Name: ______________________________________

What is a right angle?

a. An angle that measures exactly 90 degrees or the perfect L
b. Angles that can be added together in a shape to equal 90 degrees
c. An angle that is less than 90 degrees or the perfect L
d. An angle that is more than 90 degrees or the perfect L

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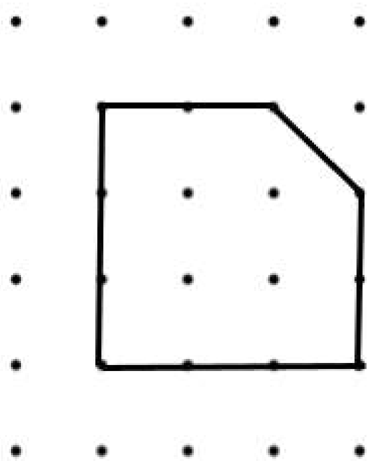
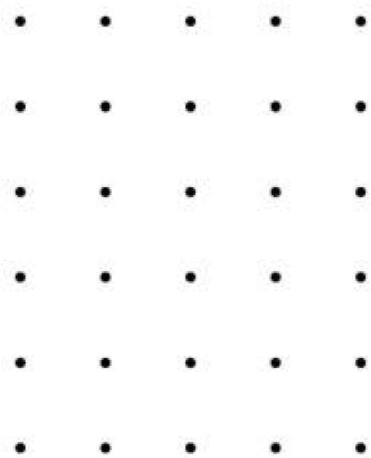
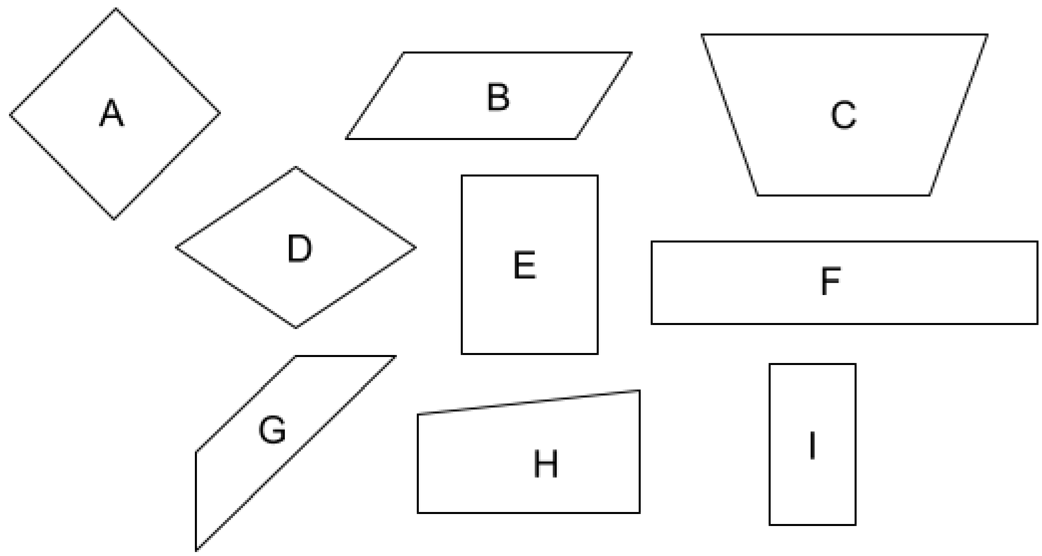
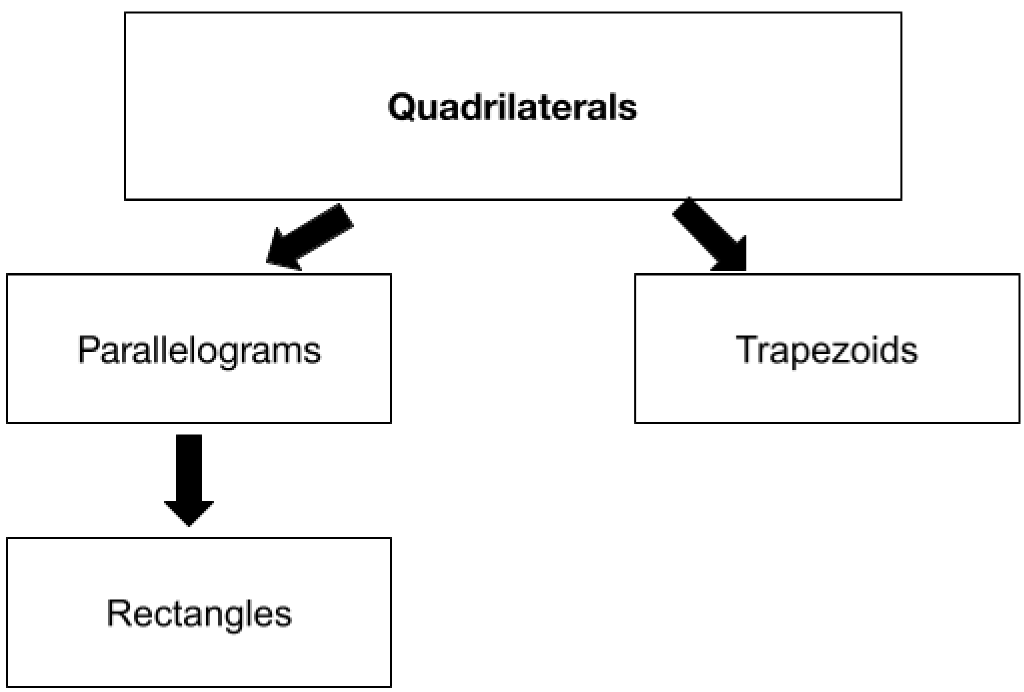
Damian drew the shape below in his notebook and said, “I drew a rectangle with right angles!”. Why isn’t Damian’s shape a rectangle? Explain in words and then draw a picture of a rectangle to help Damian.

Damian’s Drawing	Your Drawing:
	
Explanation: Damian’s shape is not a rectangle because ______________________________	

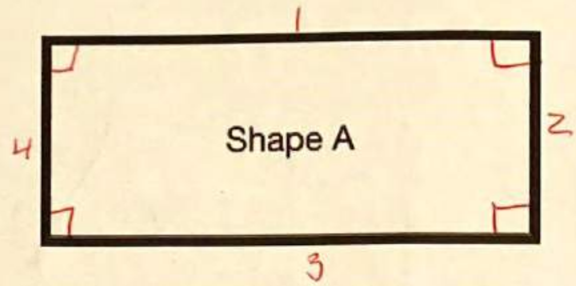
Sort the shapes below into the chart by writing the letters in the correct categories. (Hint: Some shapes will be listed in more than one category based on their attributes.)





Student Name: Answer Key

G3 U5 Lesson 4 - Let's Try It



Shape A can be classified as three of the following names. Which three names can be used for Shape A?

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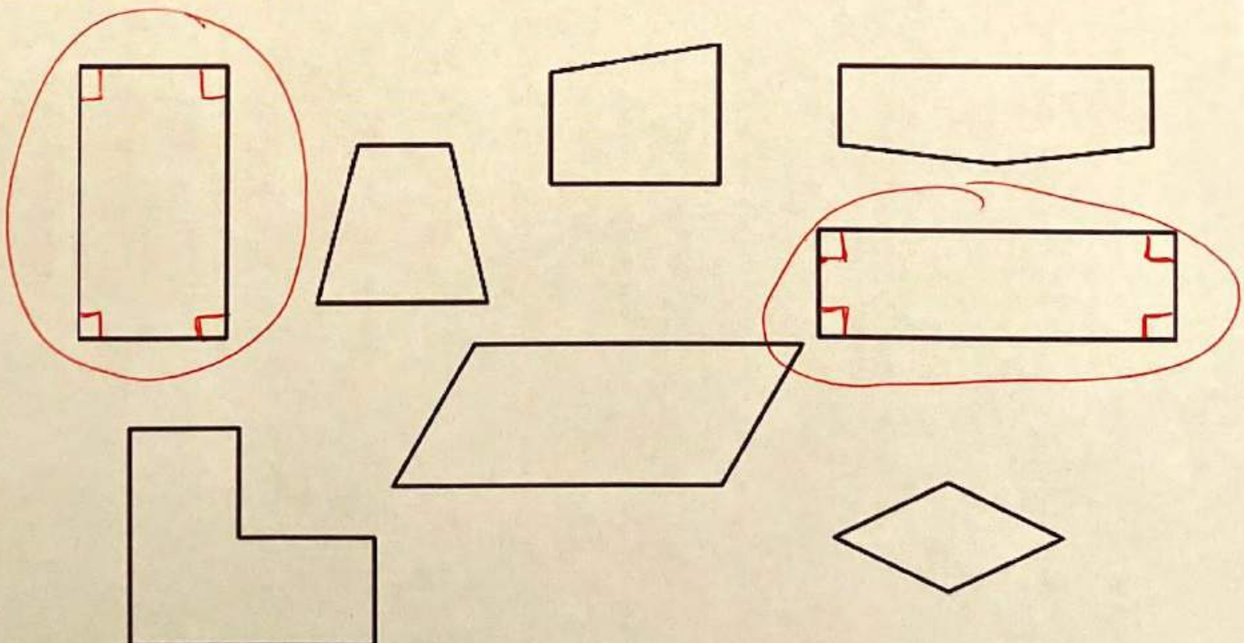
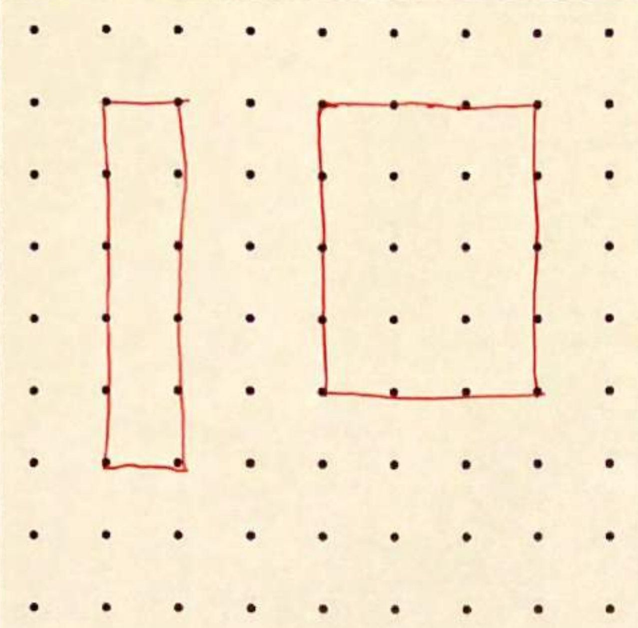
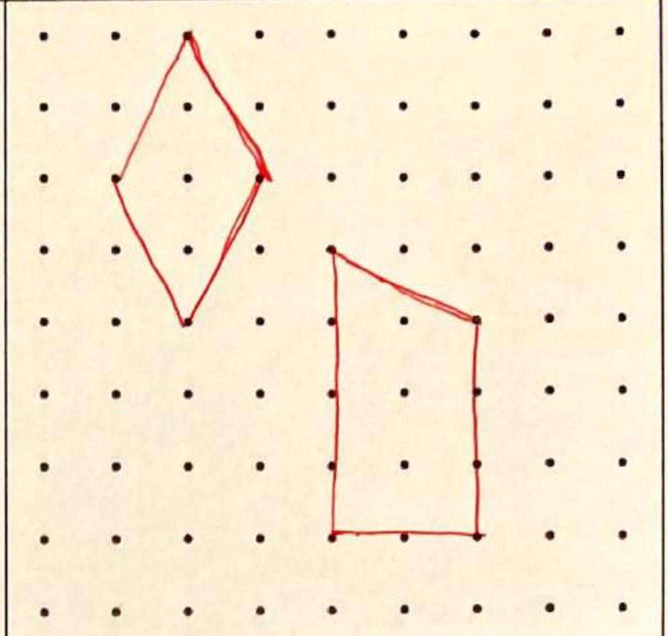


Use the dot grid below to draw **two examples of rectangles** and **two other quadrilaterals** that are **not** rectangles.

Rectangles	Other quadrilaterals
	

Student Name: Answer Key

What is a right angle?

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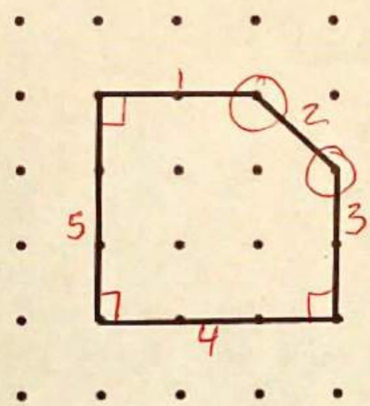
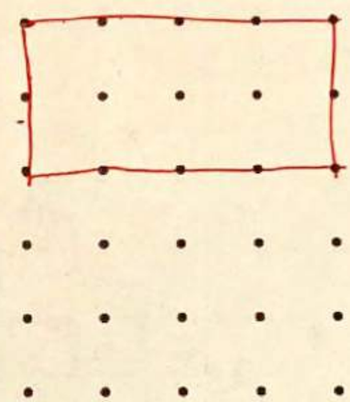
Damian drew the shape below in his notebook and said, "I drew a rectangle with right angles!". Why isn't Damian's shape a rectangle? Explain in words and then draw a picture of a rectangle to help Damian.

Damian's Drawing

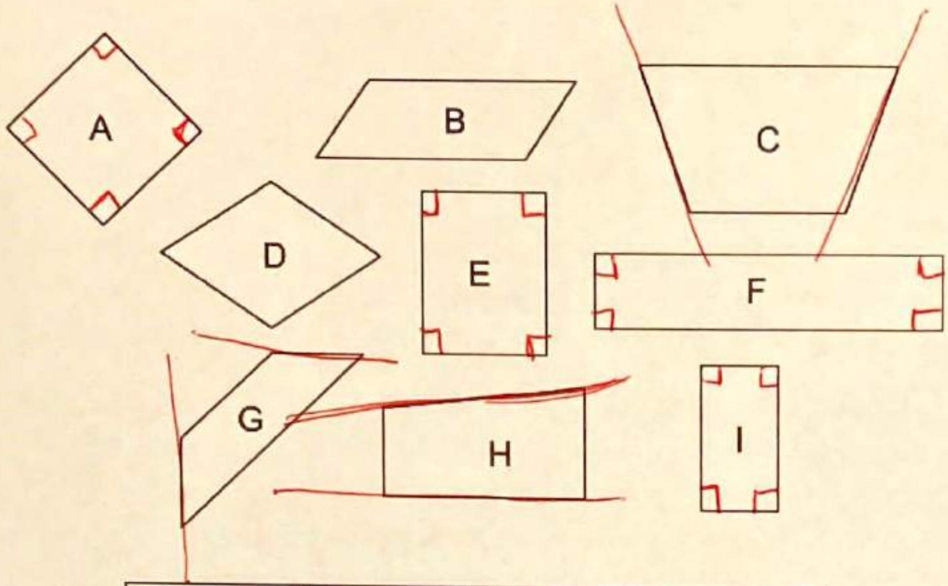


Your Drawing:



Explanation: Damian's shape is not a rectangle because it has 5 sides and two angles that are not right angles

Sort the shapes below into the chart by writing the letters in the correct categories. (Hint: Some shapes will be listed in more than one category based on their attributes.)



Quadrilaterals

A B C D E F G H I

Parallelograms

A B D E F I

Trapezoids

C G H

Rectangles

A E F

G3 U5 Lesson 5

Describe rhombuses

G3 U5 Lesson 5 - Students will describe the attributes of rhombuses.

Tutor Notes: In today's lesson, students will continue to learn about another subcategory of parallelograms, rhombuses. Students regularly will refer to a rhombus as a diamond, but encourage them to use the precise terminology for shapes and attributes. Rhombuses are unique in the parallelogram family because they have four sides that are congruent, or of equal length, in addition to opposite angles that are congruent. A lot of conceptual understanding of geometry skills in third grade is grounded in understanding vocabulary, so throughout the lessons, encourage students to restate thinking or responses with the most precise and accurate vocabulary terms possible. This will support them as they begin to reason with statements like, "A square can be a rectangle or a rhombus, but a rhombus and a rectangle cannot be a square." The more they understand words like congruent, angles, and parallel, the better equipped they are to explain their thinking.

Materials:

- Rhombuses for model for every student

Warm Welcome (Slide 1): Tutor choice.

Frame the Learning/Connect to Prior Learning (Slide 2): The last time we met, we discussed a specific type of parallelogram…rectangles. We learned that rectangles are a type of parallelogram that have 4 right angles! Today we are going to talk about a different type of parallelogram, rhombuses.

Let's Talk (Slide 3): First, let's take a look at some common objects I have pictured on the slide. We have a whiteboard, a chocolate bar, a window, and a pair of earrings. Some of these objects are examples of rectangles and some are not. **Which objects are rectangles? How do you know? Which of the objects are not rectangles? How do you know? What makes them different from a rectangle?** Possible Student Answers, Key Points:

- The chocolate bar is a rectangle, I see 2 sets of parallel lines and 4 right angles!
- The whiteboard is a rectangle!
- The window and the earrings are not rectangles.
- They are not rectangles because they do not have right angles.
- They are different because they have acute and obtuse angles.

Let's Talk (Slide 4): Before we look closely at rhombuses, we need to first understand what it means for sides and angles to be **congruent**. Let's look at the images on the screen and see if we can figure out what it means for something to be congruent. I'm going to read a sentence and I want you to study what I'm describing to see if you can figure out what congruent means.

- These two lines (*point),* are congruent.
- These two angles (*point)* are congruent.
- And this parallelogram (*point)* has opposite sides that are congruent.

Based on what you see here, what do you think congruent means? They are the same size. Right! Congruent means THE EXACT SAME! Do you see how this parallelogram has little tick marks on opposite sides? That is telling you that the two sides are the same length. This side with one tick mark (*point*) is congruent, or the same, as the opposite side with one tick mark.

Let's Think (Slide 5): Let's take a look at a rhombus and see if we can find some parts of the rhombus that are congruent. You can use the two paper rhombuses to investigate what might be congruent. You can try bending or folding the rhombus if that helps you test out what might be congruent.

Note: Provide the student the two cut-out model rhombuses from the lesson materials. Encourage the student to fold or manipulate the rhombus in different ways to see if they can figure out any sides or angles that may *be congruent. If the student struggles to identify anything, remind the student, "Let's think about attributes of the rhombus like sides and angles to see if we can find anything that is congruent." Model folding one of the rhombuses in half and asking the student what they notice.*

What matches up perfectly, showing us that it is congruent? Possible Student Answers, Key Points:

- All four sides are congruent to each other.
- The top and bottom angles are congruent.
- The side angles are congruent.
- Opposite angles are congruent in a rhombus.

Let's Think (Slide 6): Great job reasoning with the rhombuses to figure out that all four sides are congruent, or the same length. If we think back to our opening pictures with the window and the earrings, we could notice that all of their sides are the same length.

Let's Think (Slide 7): You also saw that the top and bottom angles are congruent or the same size. Again, if we imagined folding that window or the earrings in half, we could see that the opposite angles match up with each other, showing us they are congruent.

Let's Think (Slide 8): And you noticed the same to be true about the side angles. So, we can say that a rhombus has four congruent sides and opposite angles are congruent.

Let's Think (Slide 9): Rhombuses are a part of the quadrilateral family because they have four sides. They are also part of the parallelogram family, because they have two sets of parallel sides. However, they are in a different subgroup of parallelograms than rectangles, because they have some attributes that are different from rectangles.

Let's Try it (Slides 10): So now we have figured out that a rhombus is both a quadrilateral and a parallelogram, but we specifically classify it as a rhombus because it has four congruent sides and opposite angles that are congruent. Let's practice applying this understanding of the attributes of a rhombus together.

WARM WELCOME

Today we will describe the attributes of rhombuses.

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Let's Talk:

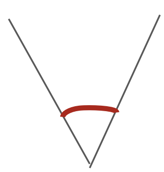
Consider the objects above: a window, a whiteboard, a chocolate bar, and a pair of earrings.

- Which objects are rectangles? How do you know?
- Which objects are not rectangles? How do you know?

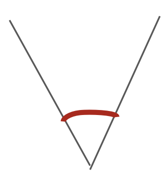
Let's Think:

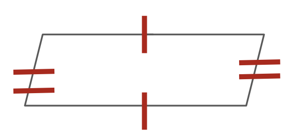
What does it mean for sides and angles to be **congruent**?

These lines are **congruent.**



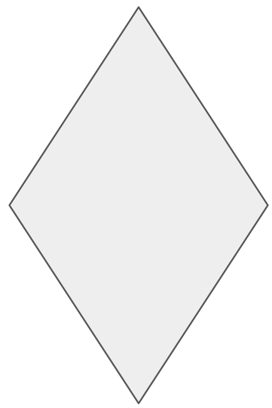
These angles are **congruent.**



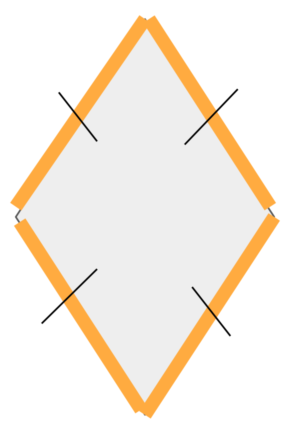


This parallelogram has opposite sides that are **congruent.**

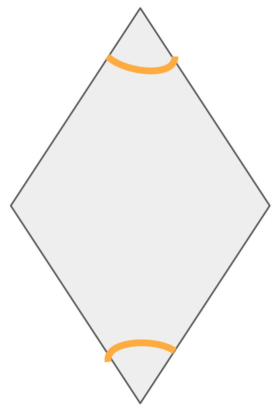
Let's Think: What do you notice in the rhombus that is congruent?



Let's Think: What do you notice in the rhombus that is congruent?



Let's Think: What do you notice in the rhombus that is congruent?



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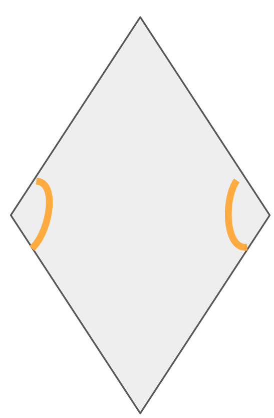
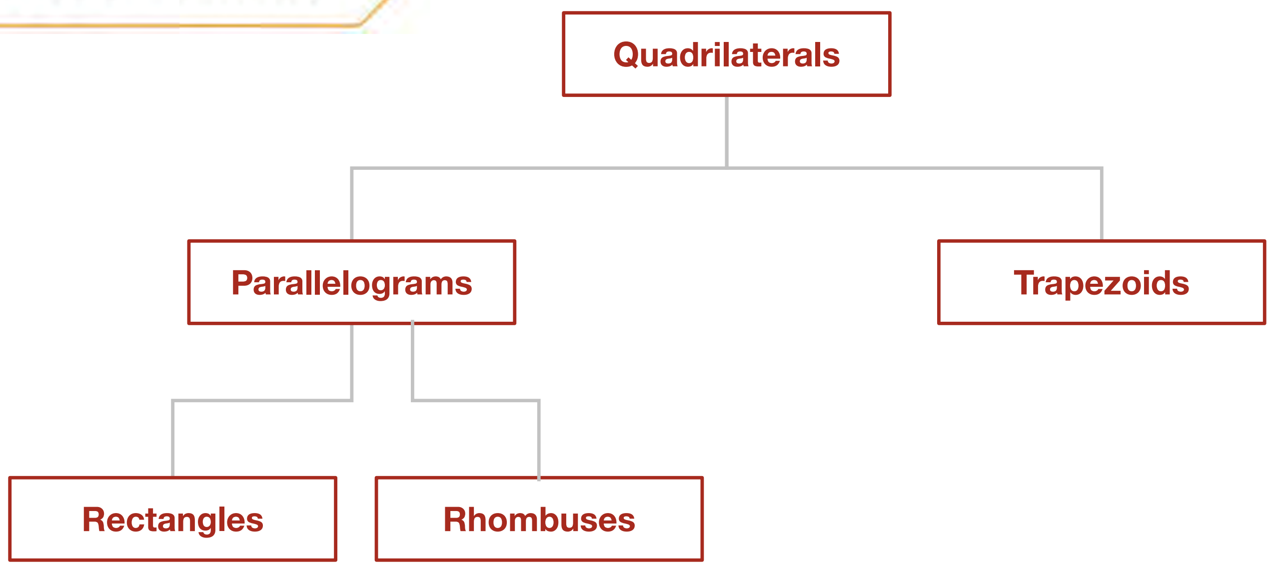
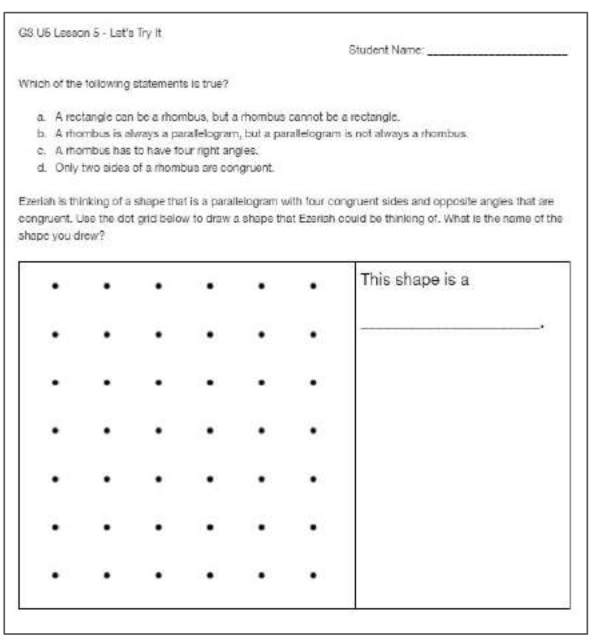


Let's Think:



Let's Try It:

Let's apply our understanding together.


G3 U5 Lesson 5 - Let's Try It

Student Name: ______________________

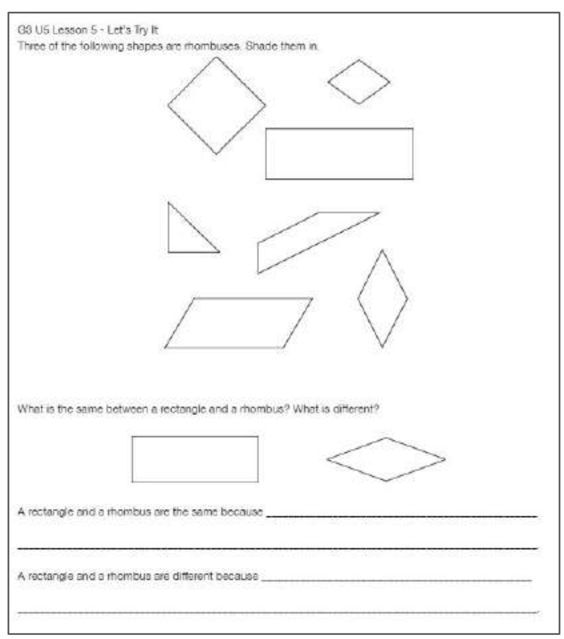
Which of the following statements is true?

a. A rectangle can be a rhombus, but a rhombus cannot be a rectangle.
b. A rhombus is always a parallelogram, but a parallelogram is not always a rhombus.
c. A rhombus has to have four right angles.
d. Only two sides of a rhombus are congruent.

Ezeriah is thinking of a shape that is a parallelogram with four congruent sides and opposite angles that are congruent. Use the dot grid below to draw a shape that Ezeriah could be thinking of. What is the name of the shape you drew?

This shape is a

______________________.


G3 U5 Lesson 5 - Let's Try It

Three of the following shapes are rhombuses. Shade them in.

What is the same between a rectangle and a rhombus? What is different?

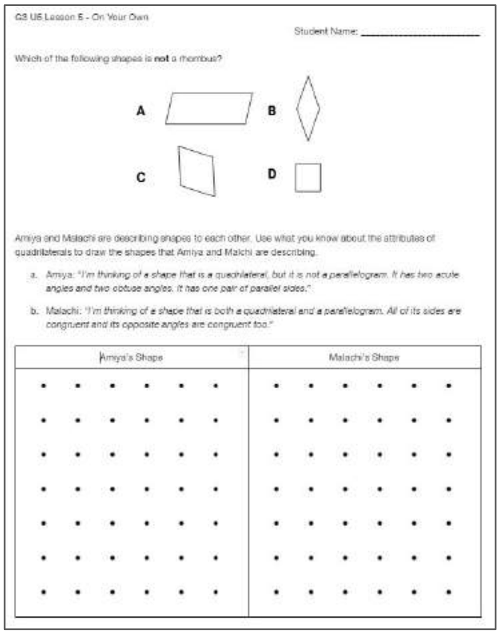
A rectangle and a rhombus are the same because ______________________

____

A rectangle and a rhombus are different because ______________________

____

On your Own: Let’s try on our own.



G3 U6 Lesson 6 - On Your Own

Student Name: ____________________

Which of the following shapes is **not** a rhombus?

A B

C D

Amiya and Malachi are describing shapes to each other. Use what you know about the attributes of quadrilaterals to draw the shapes that Amiya and Malchi are describing.

a. Amiya: *"I'm thinking of a shape that is a quadrilateral, but it is not a parallelogram. It has two acute angles and two obtuse angles. It has one pair of parallel sides."*

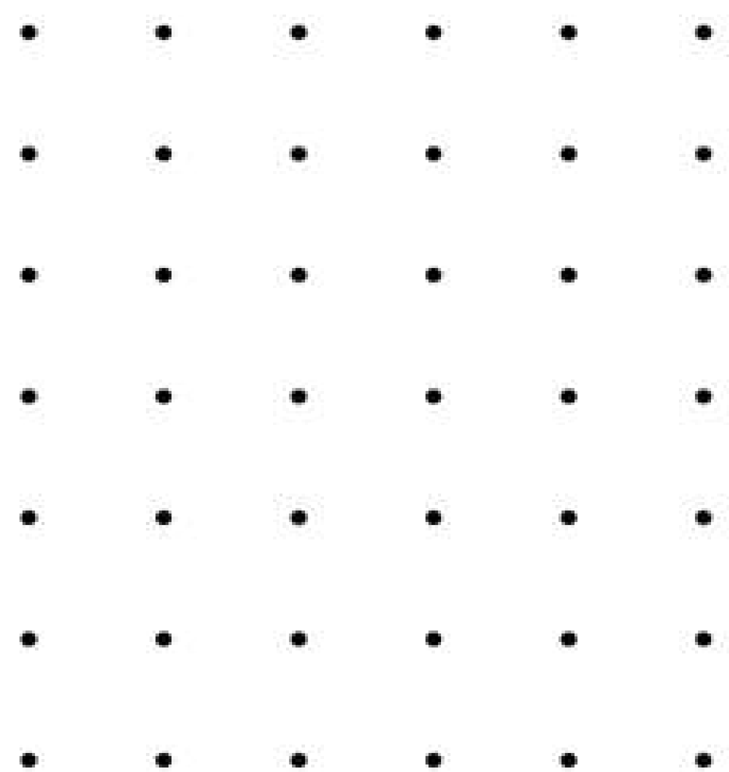
b. Malachi: *"I'm thinking of a shape that is both a quadrilateral and a parallelogram. All of its sides are congruent and its opposite angles are congruent too."*

Amiya's Shape	Malachi's Shape

Which of the following statements is true?

a. A rectangle can be a rhombus, but a rhombus cannot be a rectangle.
b. A rhombus is always a parallelogram, but a parallelogram is not always a rhombus.
c. A rhombus has to have four right angles.
d. Only two sides of a rhombus are congruent.

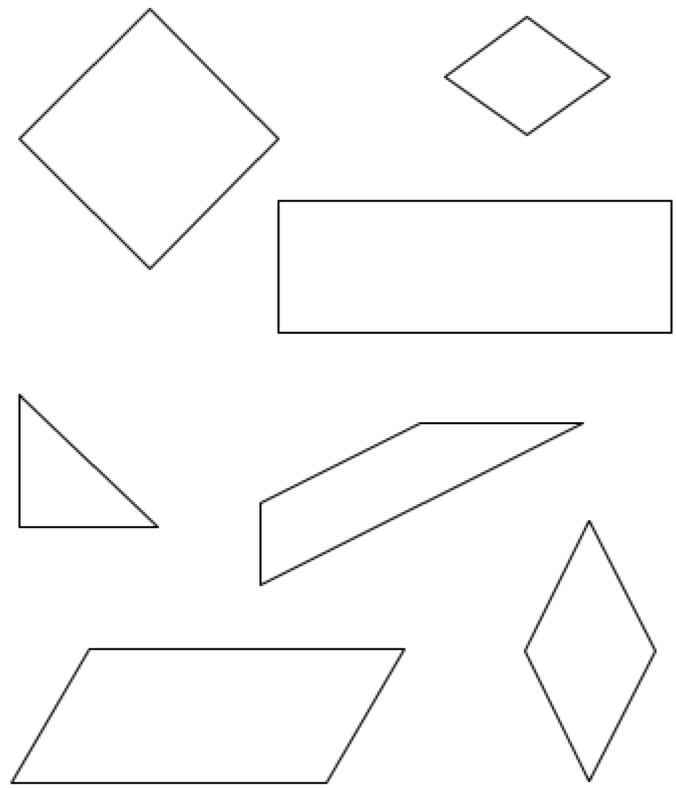
Ezeriah is thinking of a shape that is a parallelogram with four congruent sides and opposite angles that are congruent. Use the dot grid below to draw a shape that Ezeriah could be thinking of. What is the name of the shape you drew?



This shape is a

_________________________.

Three of the following shapes are rhombuses. Shade them in.



What is the same between a rectangle and a rhombus? What is different?

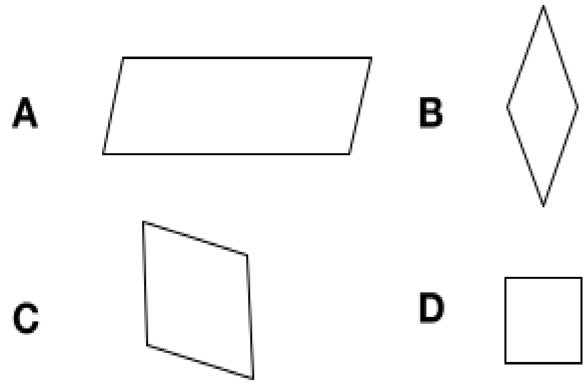
A rectangle and a rhombus are the same because ____

____.

A rectangle and a rhombus are different because ____

____.

Which of the following shapes is **not** a rhombus?



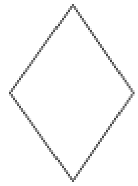
Amiya and Malachi are describing shapes to each other. Use what you know about the attributes of quadrilaterals to draw the shapes that Amiya and Malchi are describing.

a. Amiya: *"I'm thinking of a shape that is a quadrilateral, but it is not a parallelogram. It has two acute angles and two obtuse angles. It has one pair of parallel sides."*

b. Malachi: *"I'm thinking of a shape that is both a quadrilateral and a parallelogram. All of its sides are congruent and its opposite angles are congruent too."*

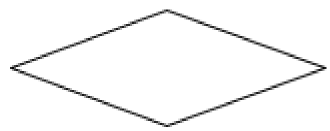
Amiya's Shape	Malachi's Shape

The shape below can be classified as three of the following. Select the three names that can apply to the shape.



a. Pentagon
b. Parallelogram
c. Trapezoid
d. Rectangle
e. Quadrilateral
f. Square
g. Rhombus

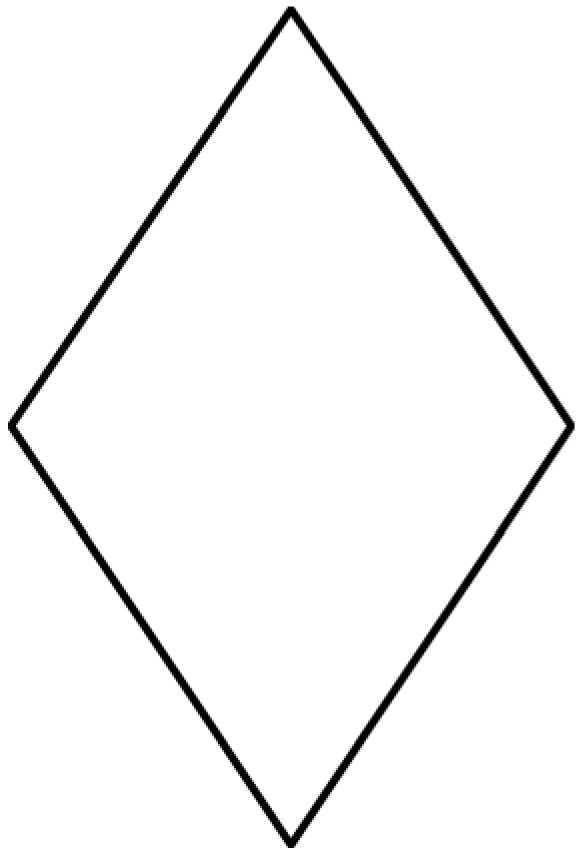
Why can’t a rhombus be part of the trapezoid family? Explain your thinking using the shapes below and a written statement.

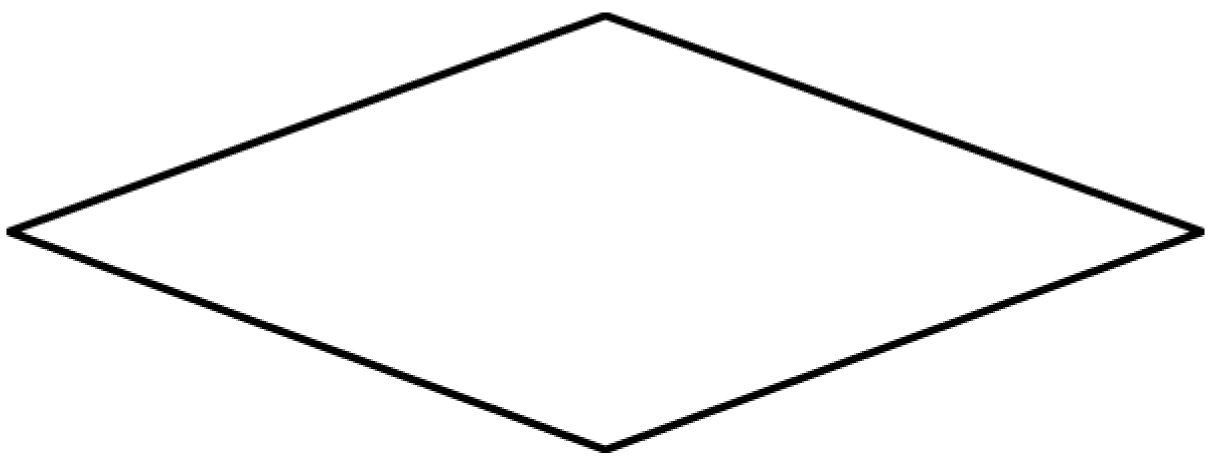


A rhombus can’t be part of the trapezoid family because ____

____

____.





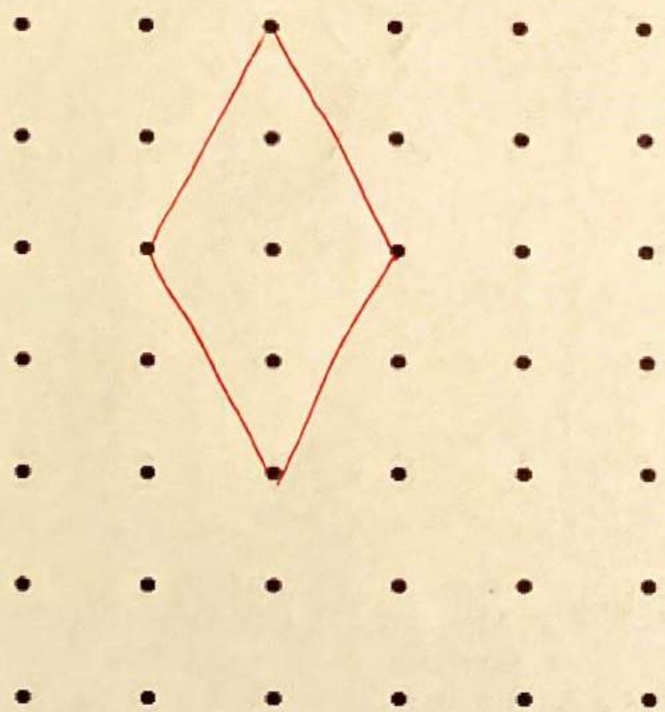
Student Name: Answer Key

G3 U5 Lesson 5 - Let's Try It

Which of the following statements is true?

a. A rectangle can be a rhombus, but a rhombus cannot be a rectangle.
b. A rhombus is always a parallelogram, but a parallelogram is not always a rhombus.
c. A rhombus has to have four right angles.
d. Only two sides of a rhombus are congruent.

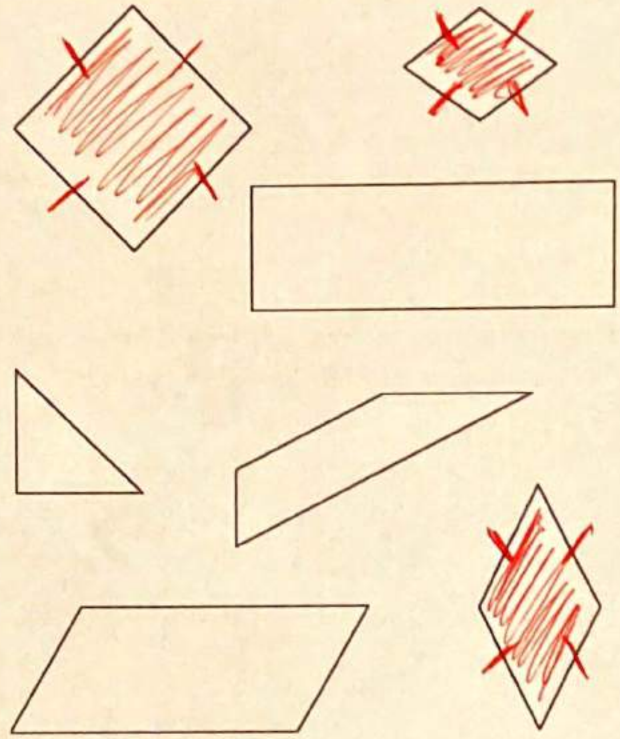
Ezeriah is thinking of a shape that is a parallelogram with four congruent sides and opposite angles that are congruent. Use the dot grid below to draw a shape that Ezeriah could be thinking of. What is the name of the shape you drew?



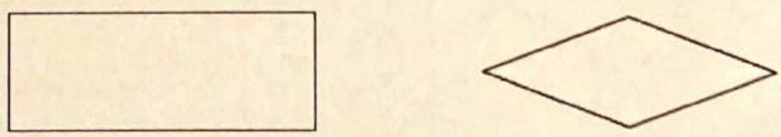
This shape is a

rhombus.

Three of the following shapes are rhombuses. Shade them in.



What is the same between a rectangle and a rhombus? What is different?



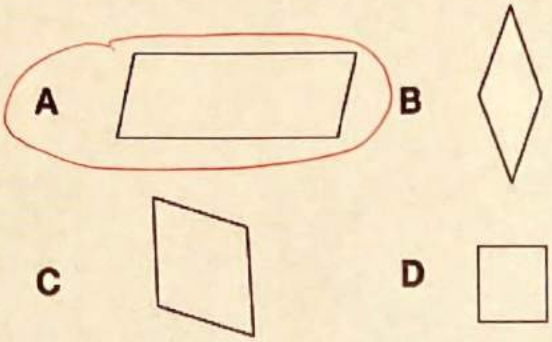
A rectangle and a rhombus are the same because they are both parallelograms.

____.

A rectangle and a rhombus are different because a rhombus has 4 congruent sides but a rectangle has congruent opposite sides.

Student Name: Answer Key G3 U5 Lesson 5 - Independent Work

Which of the following shapes is **not** a rhombus?



Amiya and Malachi are describing shapes to each other. Use what you know about the attributes of quadrilaterals to draw the shapes that Amiya and Malchi are describing.

a. Amiya: *"I'm thinking of a shape that is a quadrilateral, but it is not a parallelogram. It has two acute angles and two obtuse angles. It has one pair of parallel sides."*

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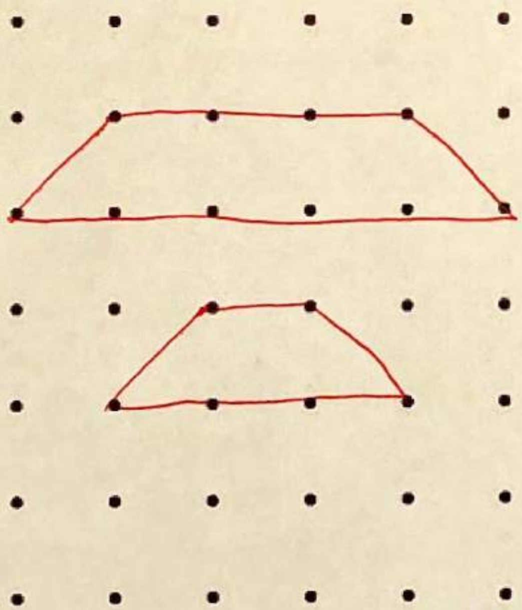
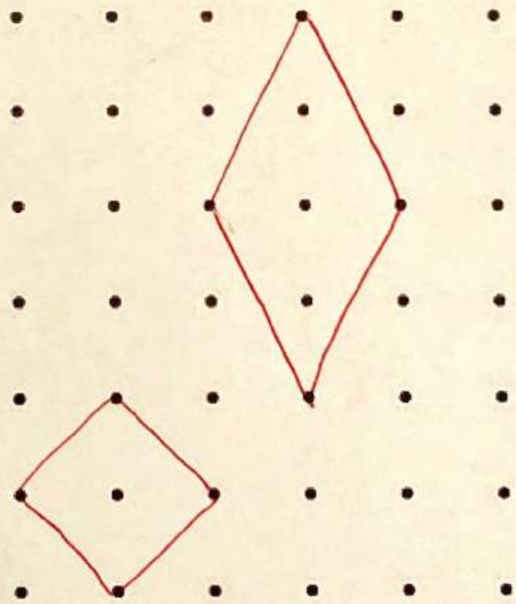
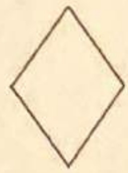
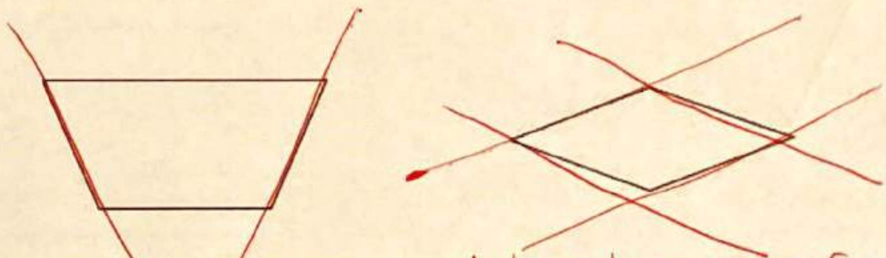
Amiya's Shape	Malachi's Shape
	

The shape below can be classified as three of the following. Select the three names that can apply to the shape.



a. Pentagon
b. Parallelogram
c. Trapezoid
d. Rectangle
e. Quadrilateral
f. Square
g. Rhombus

Why can't a rhombus be part of the trapezoid family? Explain your thinking using the shapes below and a written statement.



A rhombus can't be part of the trapezoid family because it has two pair of parallel sides.

G3 U5 Lesson 6

Describe squares

CITYTUTOR DC

G3 U5 Lesson 6 - Students will describe the attributes of squares

Tutor Notes: Students have been in the weeds of the parallelogram family with you for a few lessons so far, and today you will discuss the most specialized parallelogram, the square. A square is both a rectangle, as it has four right angles, and a rhombus, as it has four congruent sides. It is important for students to understand that a square is part of all of the prior "families" on the flow chart - it is a quadrilateral, parallelogram, rhombus, and a rectangle; but, it's most precise name is square because it has four congruent sides **and** four right angles.

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): We have been learning all about different shapes within the parallelogram family, and today we are going to continue that learning by discussing the special attributes of a square.

Let's Review (Slide 3): We have been adding more shapes to our flowchart over the last few lessons together. In our last two lessons we discussed how rectangles and rhombuses are both part of the parallelogram family, but they have different attributes that put them into different subgroups.

Let's Review (Slide 4): Today we are going to learn about how a square is the most special parallelogram because it fits into every family that comes before it on the flowchart.

Let's Review (Slide 5): Before we get into today's lesson, I want to pause to make sure we remember some very important vocabulary words. These words are essential to our understanding of what makes a square unique from the other parallelograms we have discussed.

What does it mean if something is congruent?

- They are the same length.
- They have the same measurements.
- They are exactly the same size.

What is a right angle?

- An angle that measures 90 degrees.
- An angle that makes a perfect capital L.

That's right, if two things are **congruent** it means that they are the exact same. Sides and angles can be congruent. Yesterday, we learned that the rhombus has 4 congruent sides, 4 sides that are all the same length. And a right angle is a 90 degree angle that makes a perfect L, although the L might be facing a different way.

Let's Talk (Slide 6): Here we have some examples of some real life objects. Some are examples of squares, some are not. **What do you think makes squares special? What do you notice about the objects sorted on the slide?** Possible Student Answers, Key Points:

- The squares all have four right angles.
- The squares all have congruent sides.
- The square tiles are different from the other tiles because they have right angles and the other tiles don't.
- The kite doesn't have right angles, and the squares do.
- The garden doesn't have four congruent sides the way the squares do.

Let's Talk (Slide 7): As we saw in our flowchart and you started to notice with those objects, a square is the most special type of parallelogram because it has the most attributes. It's a quadrilateral with four sides, it's a parallelogram with two pairs of parallel sides, it's a rectangle with four right angles, and it's a rhombus with four congruent sides. All four of those attributes have to be true for us to call something a square.

Let's Think (Slide 8): Let's see if we can reason through the difference between a rectangle and a square. Let's consider side lengths and angles to see if we can determine how rectangles and squares are different. **What do you notice is different?** Possible Student Answers, Key Points:

- The square has four congruent sides, but the rectangle only has opposite congruent sides.
- They're different colors.
- The rectangle is long but the square isn't.
- They both have 4 right angles.

That's right, a square is a special kind of rectangle because it has 4 right angles but it ALSO has 4 congruent sides.

Let's Think (Slide 9): Let's see if we can reason through the difference between a rhombus and a square. Let's consider side lengths and angles to see if we can determine how rhombuses and squares are different. **What do you notice is different?** Possible Student Answers, Key Points:

- The square has to have four right angles, but the rhombus has acute and obtuse angles.
- The square has four right angles, but the rhombus has opposite congruent angles.
- The rhombus is thinner than the square.
- They both have 2 sets of parallel sides.

That's right, a square is a special type of rhombus because like a rhombus it has 4 congruent sides and 2 sets of parallel sides but it's super special because it ALSO has…4 right angles!

It's important to remember all of our shape attributes when we're describing shapes. We can be specific about the type of sides shapes have–whether they're parallel or congruent and we can be specific about the types of angles shapes have–whether they have right angles, obtuse angles, or acute angles.

Let's Try it (Slide 10): We are going to practice identifying, describing, and drawing squares and other types of quadrilaterals. Remember today we discussed how squares have four congruent sides and four right angles, making them a special subgroup of parallelograms.

WARM WELCOME

Today we will describe the attributes of squares.

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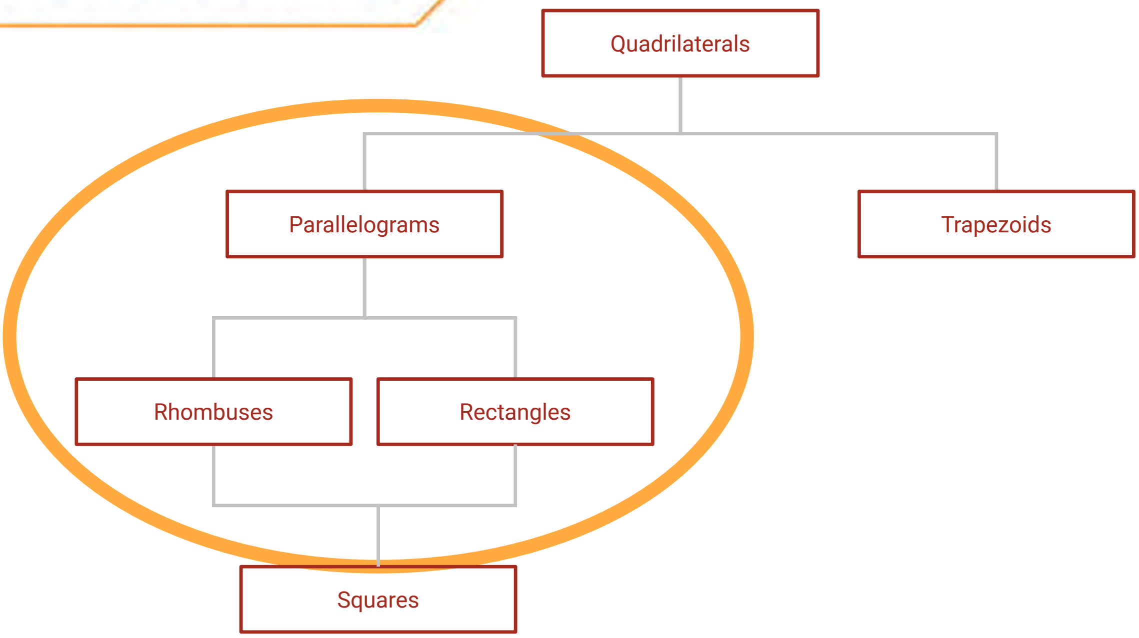
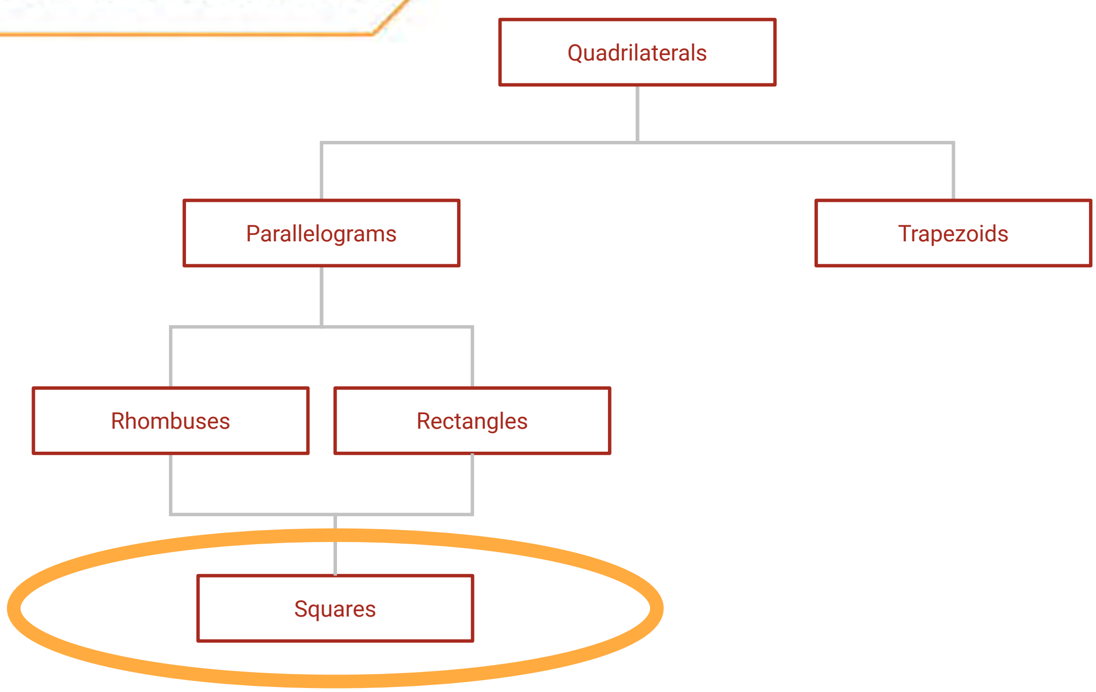
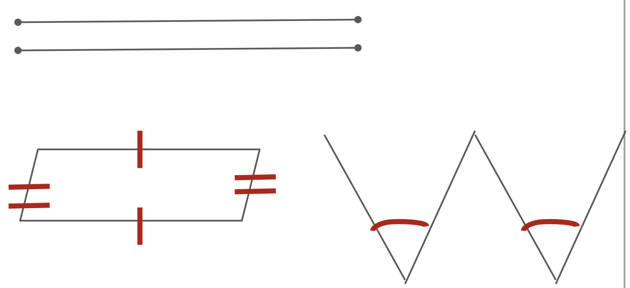
Let's Review:



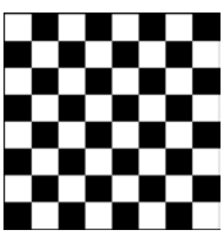
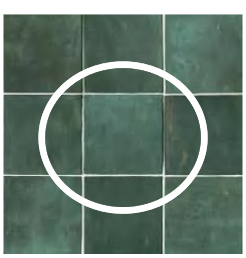
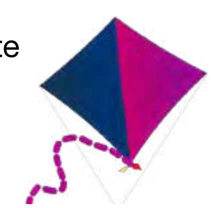
Let's Review:



Let's Review: Key Vocabulary

Congruent	Right Angle
	

Let's Talk: What makes a square special?

Squares	Non-squares
 chess board  pool  floor tiles	garden  floor tiles  kite 

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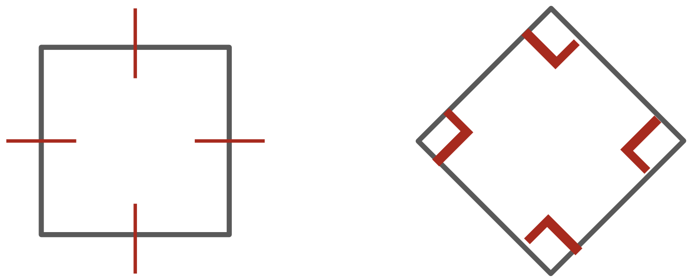
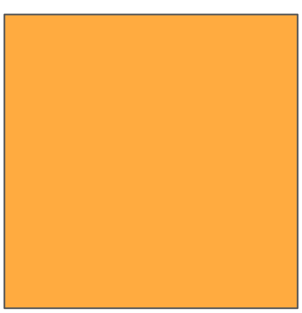
Let's Talk: What makes a square special?

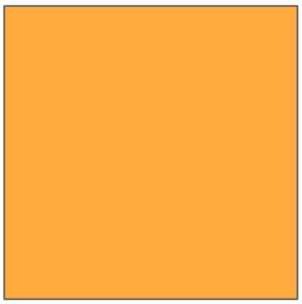
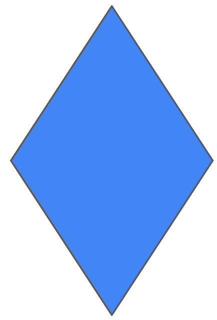
- A square **is a rectangle** because it has four right angles.
- A square **is a rhombus** because it has four congruent sides.



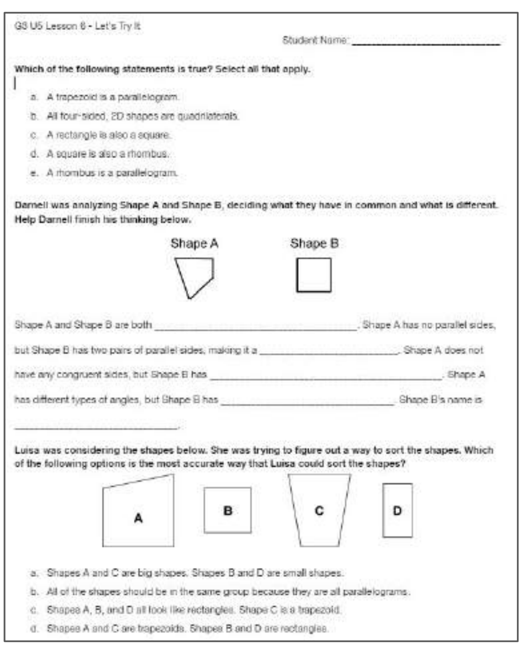
Let's Think: What's the difference?

Square	**Rectangle**
	

Let's Think: What's the difference?

Square	Rhombus
	

Let's Try It: Let's apply our understanding together.



G3 U5 Lesson 6 - Let's Try It

Student Name: ___________________________

Which of the following statements is true? Select all that apply.

a. A trapezoid is a parallelogram.
b. All four-sided, 2D shapes are quadrilaterals.
c. A rectangle is also a square.
d. A square is also a rhombus.
e. A rhombus is a parallelogram.

Darnell was analyzing Shape A and Shape B, deciding what they have in common and what is different. Help Darnell finish his thinking below.

Shape A Shape B

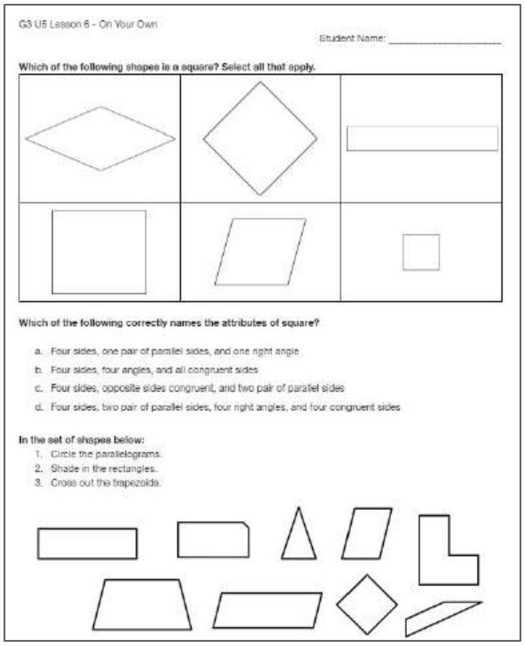
Shape A and Shape B are both ______________________________. Shape A has no parallel sides, but Shape B has two pairs of parallel sides, making it a ____________________. Shape A does not have any congruent sides, but Shape B has __________________________________. Shape A has different types of angles, but Shape B has _________________________. Shape B's name is ________________________.

Luisa was considering the shapes below. She was trying to figure out a way to sort the shapes. Which of the following options is the most accurate way that Luisa could sort the shapes?

A B C D

a. Shapes A and C are big shapes. Shapes B and D are small shapes.
b. All of the shapes should be in the same group because they are all parallelograms.
c. Shapes A, B, and D all look like rectangles. Shape C is a trapezoid.
d. Shapes A and C are trapezoids. Shapes B and D are rectangles.

On your Own: Let’s try on our own.



G3 U5 Lesson 6 - On Your Own

Student Name: ___________________

Which of the following shapes is a square? Select all that apply.

Which of the following correctly names the attributes of square?

a. Four sides, one pair of parallel sides, and one right angle
b. Four sides, four angles, and all congruent sides
c. Four sides, opposite sides congruent, and two pair of parallel sides
d. Four sides, two pair of parallel sides, four right angles, and four congruent sides

In the set of shapes below:

1. Circle the parallelograms.
2. Shade in the rectangles.
3. Cross out the trapezoids.

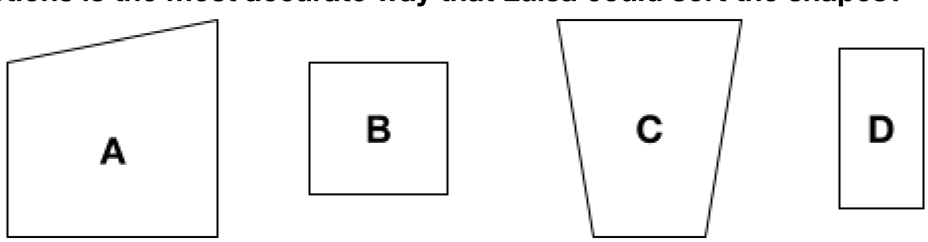
Which of the following statements is true? Select all that apply.

a. A trapezoid is a parallelogram.
b. All four-sided, 2D shapes are quadrilaterals.
c. A rectangle is also a square.
d. A square is also a rhombus.
e. A rhombus is a parallelogram.

Darnell was analyzing Shape A and Shape B, deciding what they have in common and what is different. Help Darnell finish his thinking below.

Shape A and Shape B are both ____. Shape A has no parallel sides, but Shape B has two pairs of parallel sides, making it a ___________________________. Shape A does not have any congruent sides, but Shape B has ____. Shape A has different types of angles, but Shape B has __________________________________. Shape B's name is ________________________________.

Luisa was considering the shapes below. She was trying to figure out a way to sort the shapes. Which of the following options is the most accurate way that Luisa could sort the shapes?

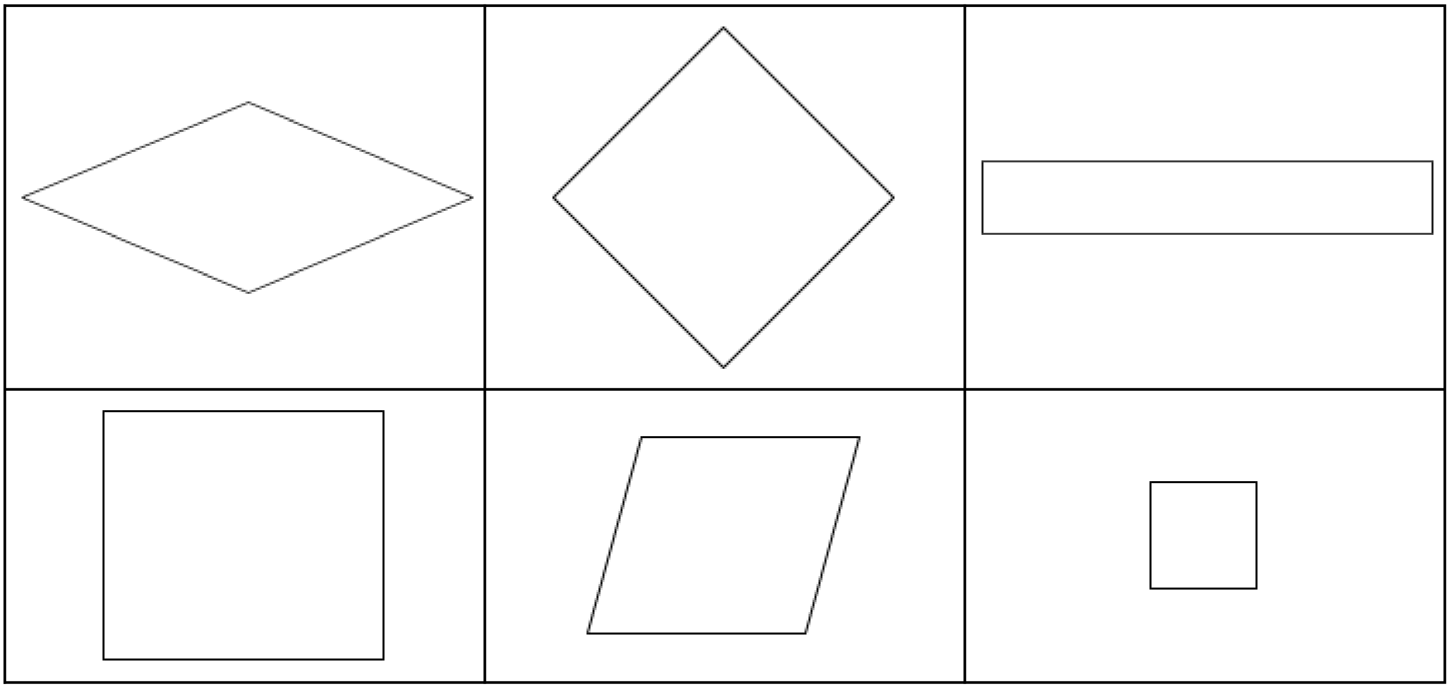


a. Shapes A and C are big shapes. Shapes B and D are small shapes.
b. All of the shapes should be in the same group because they are all parallelograms.
c. Shapes A, B, and D all look like rectangles. Shape C is a trapezoid.
d. Shapes A and C are trapezoids. Shapes B and D are rectangles.

Quadrilateral Riddles - Below are some quadrilateral riddles that describe the attributes of a quadrilateral. Use your knowledge of the attributes to name and draw the quadrilateral the riddle is talking about.

Riddle 1 ● I am a quadrilateral and a parallelogram. ● I have four right angles. ● I have four congruent sides. ● Who am I? ____________________	**Riddle 2** ● I am a quadrilateral and a parallelogram. ● My opposite angles are congruent. ● I have four congruent sides. ● Who am I? ____________________
Riddle 3 ● I am a quadrilateral. ● I have one pair of parallel sides. ● Who am I? ________________________	**Riddle 4** ● I am a quadrilateral and a parallelogram. ● I have four right angles. ● My opposite sides are congruent. ● Who am I? ______________________________

Which of the following shapes is a square? Select all that apply.

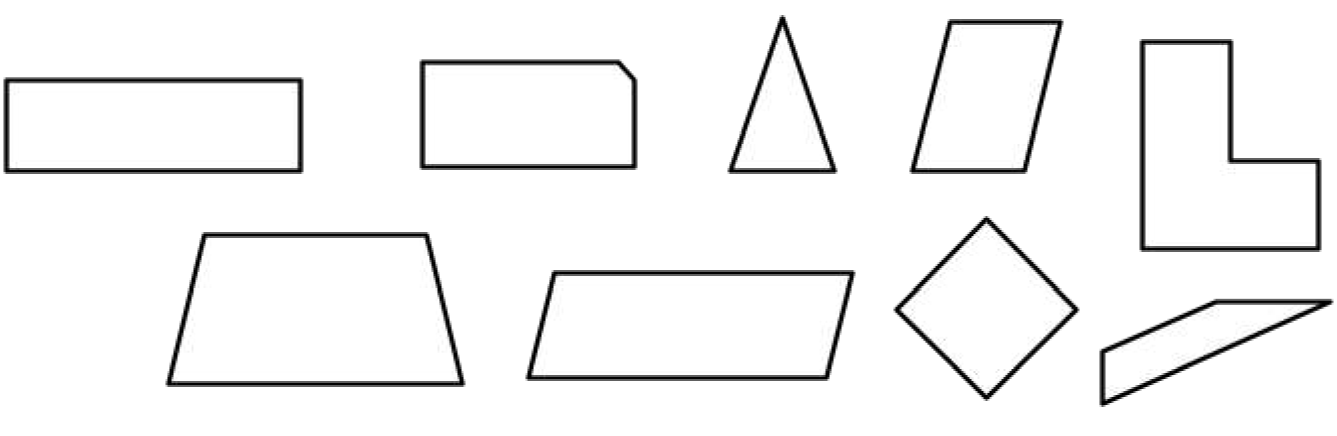


Which of the following correctly names the attributes of square?

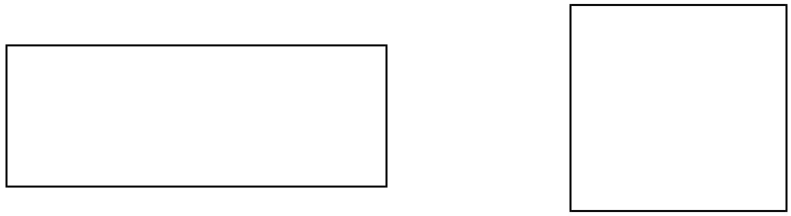
a. Four sides, one pair of parallel sides, and one right angle
b. Four sides, four angles, and all congruent sides
c. Four sides, opposite sides congruent, and two pair of parallel sides
d. Four sides, two pair of parallel sides, four right angles, and four congruent sides

In the set of shapes below:

1. Circle the parallelograms.
2. Shade in the rectangles.
3. Cross out the trapezoids.



How are a rectangle and a square the same? How are they different?



A rectangle and a square are the same because…

1.

2.

3.

A rectangle and a square are different because ____

____

____

Student Name: Answer Key

Which of the following statements is true? Select all that apply.

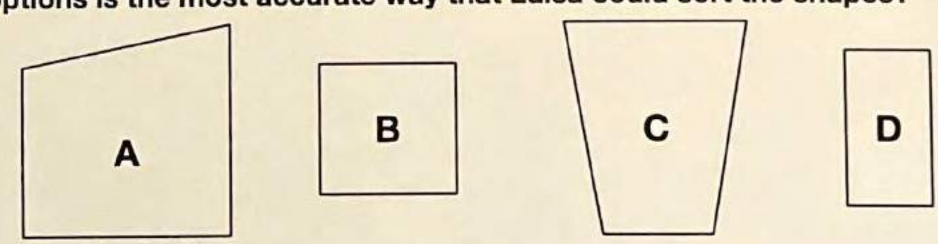
a. A trapezoid is a parallelogram.
b. All four-sided, 2D shapes are quadrilaterals.
c. A rectangle is also a square.
d. A square is also a rhombus.
e. A rhombus is a parallelogram.

Darnell was analyzing Shape A and Shape B, deciding what they have in common and what is different. Help Darnell finish his thinking below.

Shape A Shape B

Shape A and Shape B are both quadrilaterals. Shape A has no parallel sides, but Shape B has two pairs of parallel sides, making it a parallelogram. Shape A does not have any congruent sides, but Shape B has all congruent sides. Shape A has different types of angles, but Shape B has all right angles. Shape B's name is square.

Luisa was considering the shapes below. She was trying to figure out a way to sort the shapes. Which of the following options is the most accurate way that Luisa could sort the shapes?

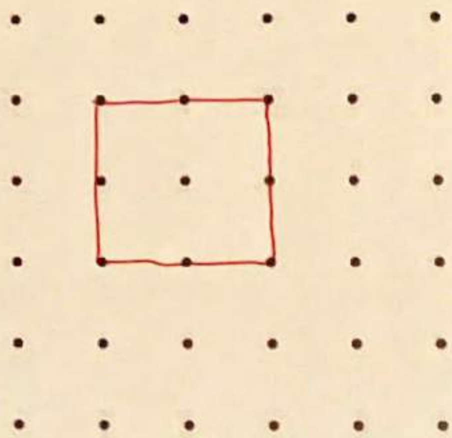


a. Shapes A and C are big shapes. Shapes B and D are small shapes.
b. All of the shapes should be in the same group because they are all parallelograms.
c. Shapes A, B, and D all look like rectangles. Shape C is a trapezoid.
d. Shapes A and C are trapezoids. Shapes B and D are rectangles.

Quadrilateral Riddles - Below are some quadrilateral riddles that describe the attributes of a quadrilateral. Use your knowledge of the attributes to name and draw the quadrilateral the riddle is talking about.

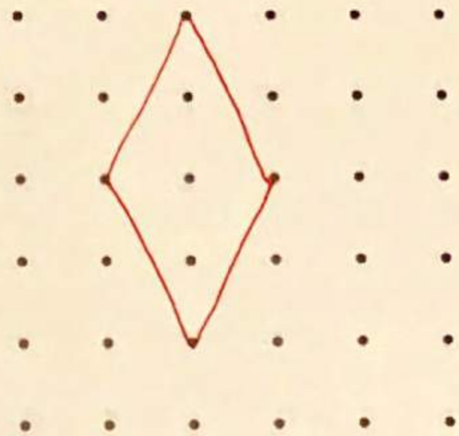
Riddle 1

- I am a quadrilateral and a parallelogram.
- I have four right angles.
- I have four congruent sides.
- Who am I? square



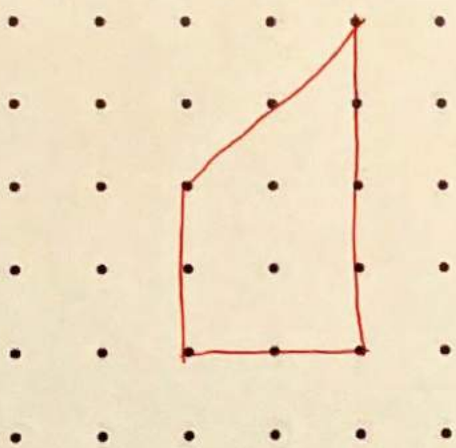
Riddle 2

- I am a quadrilateral and a parallelogram.
- My opposite angles are congruent.
- I have four congruent sides.
- Who am I? rhombus



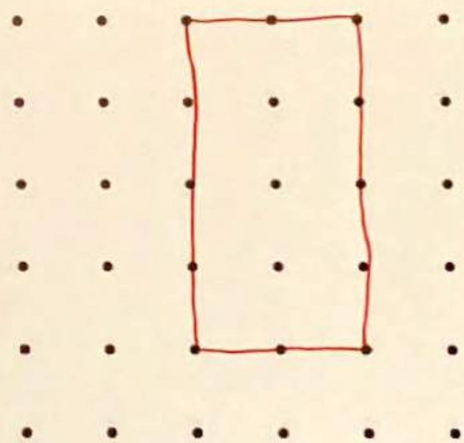
Riddle 3

- I am a quadrilateral.
- I have one pair of parallel sides.
- Who am I? trapezoid



Riddle 4

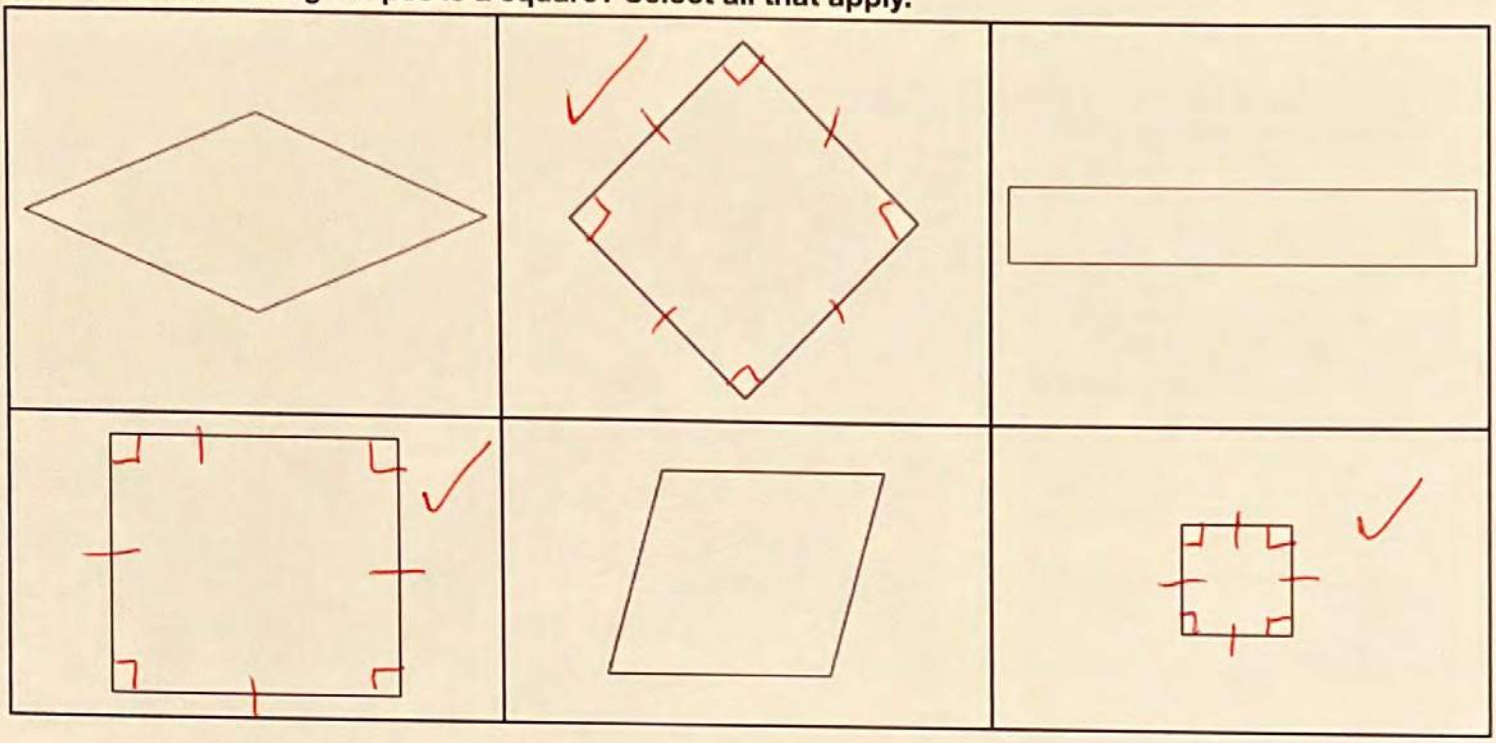
- I am a quadrilateral and a parallelogram.
- I have four right angles.
- My opposite sides are congruent.
- Who am I? rectangle



Student Name: Answer Key

G3 U5 Lesson 6 - Independent Work

Which of the following shapes is a square? Select all that apply.



Which of the following correctly names the attributes of square?

a. Four sides, one pair of parallel sides, and one right angle

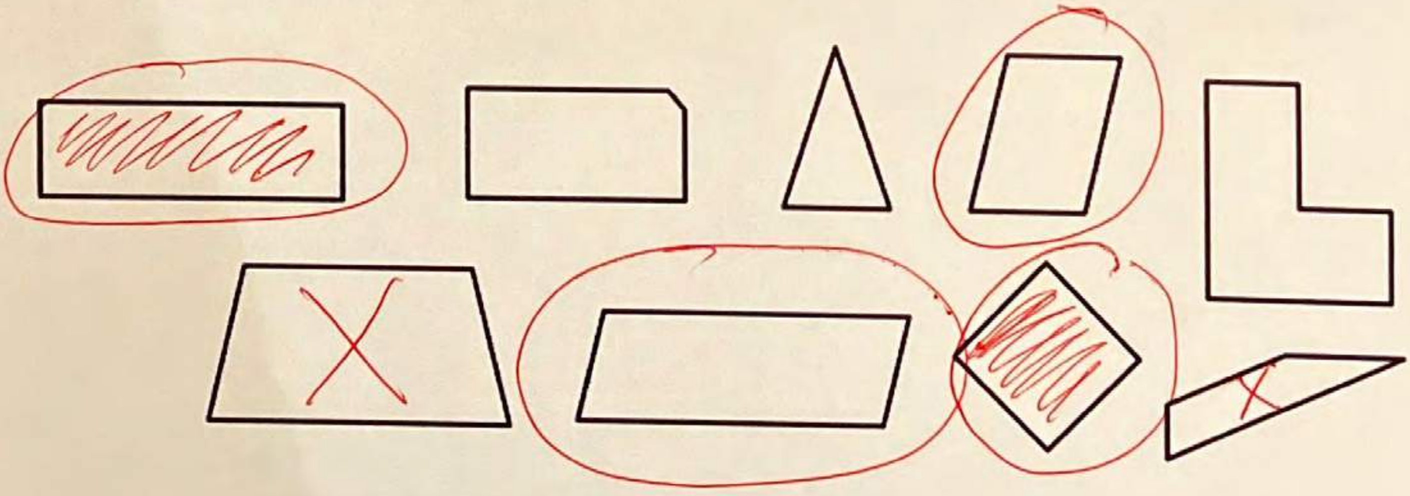
b. Four sides, four angles, and all congruent sides

c. Four sides, opposite sides congruent, and two pair of parallel sides

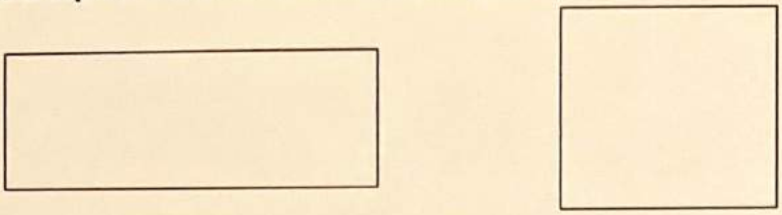
d. Four sides, two pair of parallel sides, four right angles, and four congruent sides

In the set of shapes below:

1. Circle the parallelograms.
2. Shade in the rectangles.
3. Cross out the trapezoids.



How are a rectangle and a square the same? How are they different?



A rectangle and a square are the same because...

1. They are both quadrilaterals.
2. They are both parallelograms.
3. They both have 4 right angles.

A rectangle and a square are different because a square has all sides congruent, but a rectangle has opposite sides congruent.

G3 U5 Lesson 7

Compare and classify polygons

CITYTUTOR DC

G3 U5 Lesson 7 - Students will compare and classify other types of polygons

Tutor Notes: Up to this point students have been primarily focused on understanding the family of quadrilaterals and the attributes that make shapes within that family distinct from one another. In today's lesson, you will be taking a broader look at other types of shapes/polygons. The term polygon may be unfamiliar to students. Polygons are closed figures with straight sides and no sides that cross. Students begin learning the names of polygons in Kindergarten including triangle, square, rectangle, and hexagon. They add to that learning in second grade by learning quadrilaterals and pentagons. In third grade, their skill set progresses to focus on being able to identify attributes that shapes share, being able to categorize shapes, and being able to provide examples and non-examples of given shapes. For reference, some of these concepts were addressed in Lesson 1 in this unit as well.

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): We spent a number of lessons together working on understanding all of the attributes of shapes within the quadrilateral family. Today we are going to practice a bit with shapes that are not in the quadrilateral family like triangles, pentagons, and hexagons.

Let's Review (Slide 3): We have learned about a number of different attributes that we can use to describe and classify shapes. **What are some of the attributes we can use to describe shapes? Use the shapes on the slide as examples.** Possible Student Answers, Key Points:

- Number of sides
- Number of angles
- Types of angles
- Congruent sides
- Right angles, acute angles, obtuse angles
- Parallel sides

Let's Review (Slide 4): Great job remembering so many of the attributes we've been learning about! We can describe, classify, and compare shapes by thinking about their sides - how many there are and if any of them are congruent in addition to their angles - how many there are and what types of angles the shape has.

Let's Talk (Slide 5): Today we are going to talk about a few different types of polygons. That may be an unfamiliar word for you, but let's see if we can start to figure out what a polygon is by looking at the polygons and non-polygons on the slide. **How might we describe a polygon to someone based on what we are seeing?** Possible Student Answers, Key Points:

- A polygon has all straight sides.
- A polygon does not have sides that cross or intersect.
- A polygon is closed.

Note: Students may not yet have accurate vocabulary to express what they are noticing such as intersect or closed figure. If students struggle to identify ways to describe the polygon, consider referring to the non-polygon examples first and prompt the student to think about what a polygon can't be. For example, referring to the half circle, "Take a look at this shape. What do you notice about this shape that may help us understand what a polygon can't be?"

Let's Talk (Slide 6): I know it's tough to look at a few images and try to figure out what the rules are, but you did a great job reasoning through that! Polygons are just closed shapes with straight sides and lines that do not cross, like all of the shapes we've been looking at! All of the blue shapes have straight sides and lines that don't cross. They're also all closed, like a fence! And the orange shapes AREN'T polygons because they either have curved sides, or line that cross or they're open figures.

Let's Think (Slide 7): We have a pretty interesting group of polygons here. They all look pretty different from each other, but we have to find something that is in common. **How might we start trying to figure out what they all have in common?** Count the sides. Count the angles.

Great! Let's test out counting the sides and angles and see what we find. *(Mark each side as you count and circle each angle as you count. Encourage the student to take over after you model the first shape.)* You did a great job working through each shape. So what did you notice about this group of polygons? They all have six sides. They all have six angles. They are all hexagons.

Way to go! So you determined that all of the shapes on this slide have six sides and six angles, making them all hexagons. Let's see if you can do the same thing with the next set of polygons.

Let's Think (Slide 8): Take a look at this set of polygons. Work through them the same way we just practiced together and see if you can determine what they all have in common. They all have five sides. They all have five angles. They are all pentagons.

Great job noticing that all the shapes have five sides and five angles. This makes all of these polygons, pentagons.

Let's Think (Slide 9): This chart is a reminder of the other types of polygons we talked about way back in lesson 1. It's important to understand the attributes of each group. Triangles have three sides and three angles, quadrilaterals have four sides and four angles–and lots of other names too, pentagons have five sides and five angles, and hexagons have six sides and six angles. The shapes within each group can look very different from each other as long as they have those attributes.

Let's Think (Slide 10): Let's see if we can apply our understanding about these polygons and their attributes to being able to compare and contrast a set of shapes. Look at the shapes on the slide. **What is the same about the shapes? What is different about the shapes?** Possible Student Answers, Key Points:

- They are both triangles. They both have three sides and three angles.
- One of the triangles has a right angle and the other triangle only has acute and obtuse angles.
- One of the triangles has two congruent sides, but the other triangle has all sides congruent.

Let's Think (Slide 11): Let's try one more set before we jump into our practice. **Look at the shapes on the slide. What is the same about the shapes? What is different about the shapes?** Possible Student Answers, Key Points:

- They are both hexagons. They both have six sides and six angles.
- One of the hexagons has all right angles and the other doesn't have any right angles.
- One of the hexagons has all congruent sides and the other doesn't have any congruent sides.

Let's Try it (Slide 12): We are going to practice together identifying polygons. Remember that polygons are closed figures with straight sides and no lines that cross. We will also practice being able to compare and classify polygons other than quadrilaterals by considering their attributes.

WARM WELCOME

Today we will compare and classify other types of polygons.

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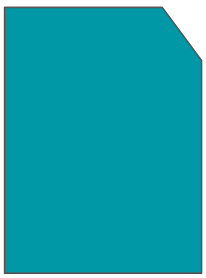
Let's Review:

What attributes do we use to describe and classify shapes?



Let's Review:

What attributes do we use to describe and classify shapes?

- Number of sides
- Number of angles
- Types of angles
- Congruent sides
- Parallel sides

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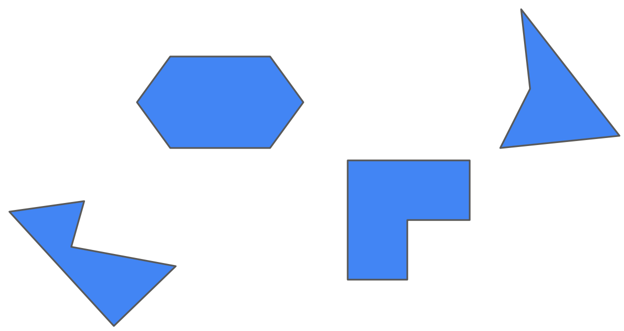
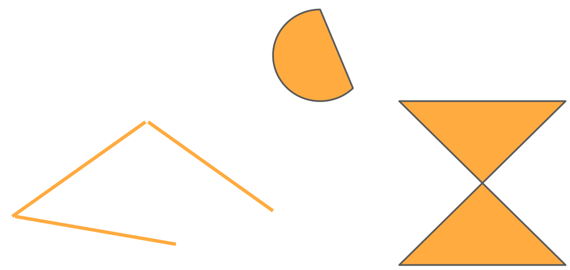
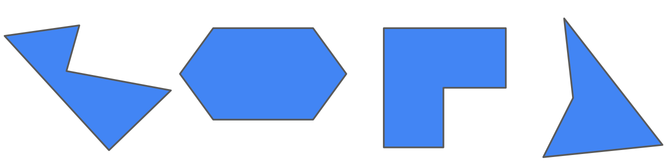
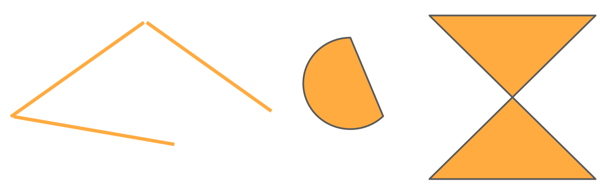
Let's Talk: What is a polygon?

Polygon	Non-polygons
	

Let's Talk: What is a polygon?

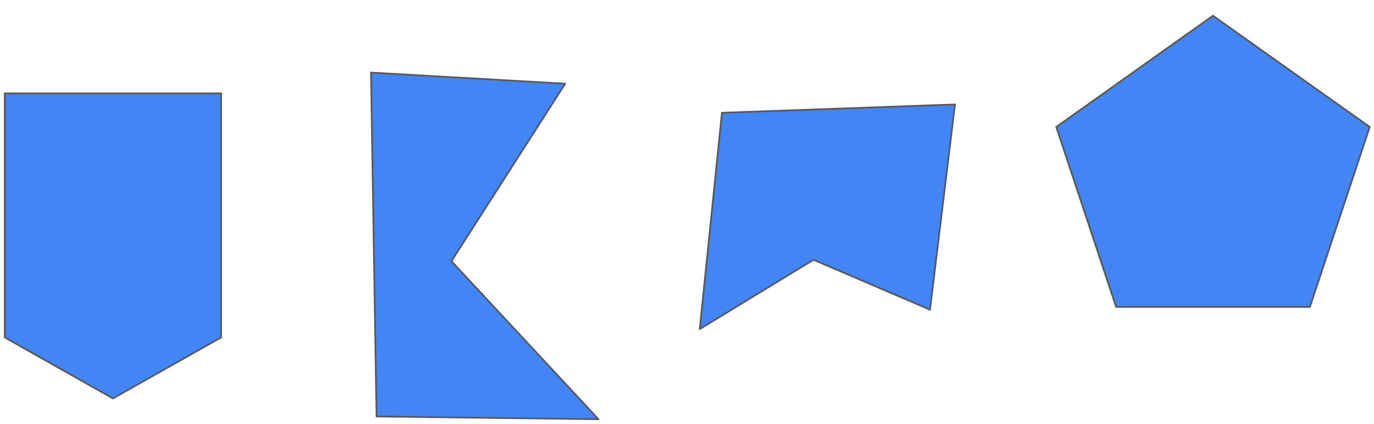
Polygon	Non-polygons
	
Closed **Straight sides** **No sides that cross**	**Open** **Curved sides** **Sides that cross**

Let's Think:

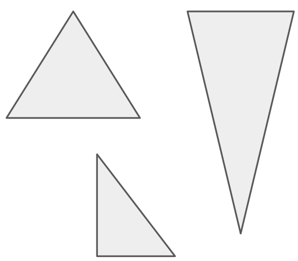
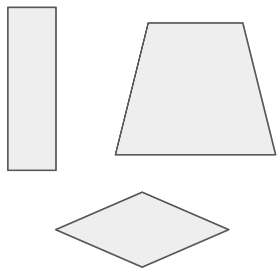
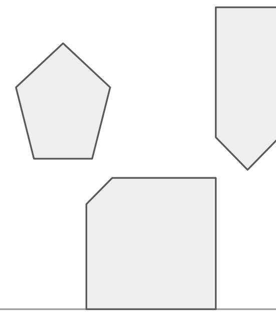
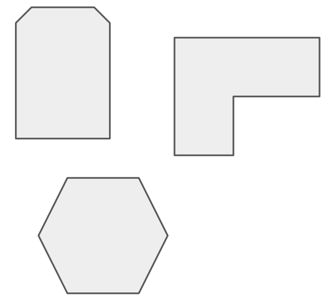
What do you notice is the same about all of these shapes?

Let's Think:

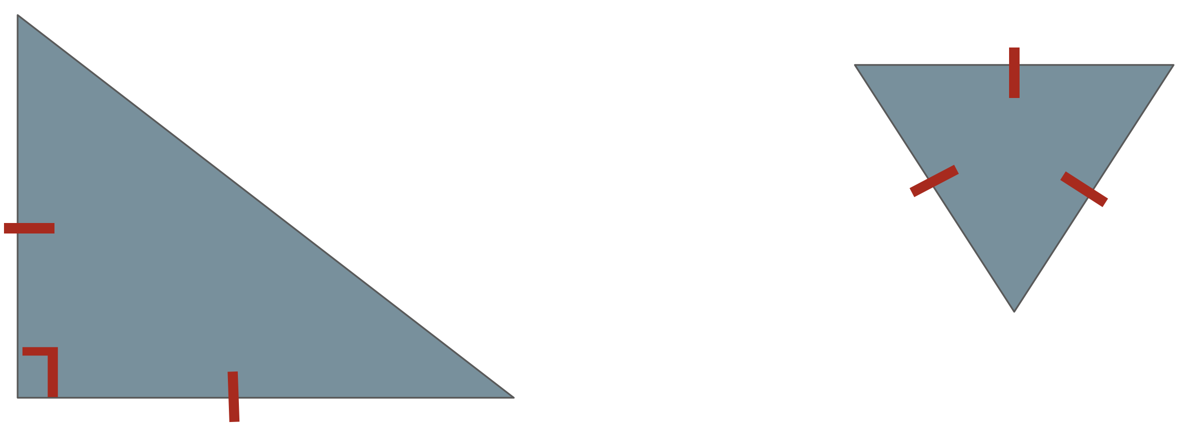
What do you notice is the same about all of these shapes?



Let's Think:

Triangles	Quadrilaterals	Pentagons	Hexagons
3 sides 3 angles	4 sides 4 angles	5 sides 5 angles	6 sides 6 angles
			

Let's Think: What is the same? What is different?

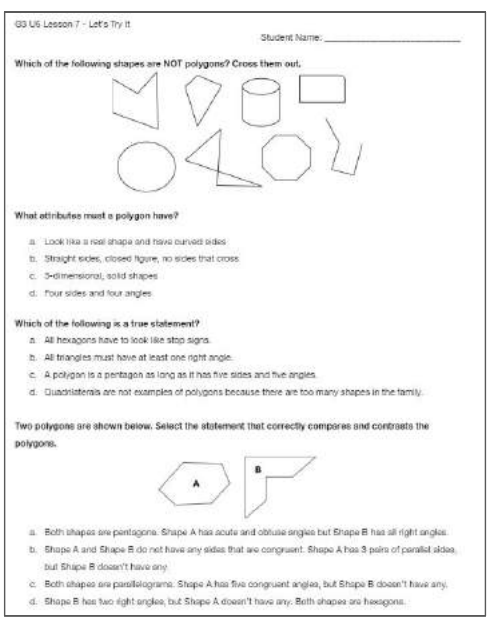


Let's Think:

What is the same? What is different?

Let's Try It:

Let's apply our understanding together.



G3 U6 Lesson 7 - Let's Try It

Student Name: ______________________

Which of the following shapes are NOT polygons? Cross them out.

What attributes must a polygon have?

a. Look like a real shape and have curved sides
b. Straight sides, closed figure, no sides that cross
c. 3-dimensional, solid shapes
d. Four sides and four angles

Which of the following is a true statement?

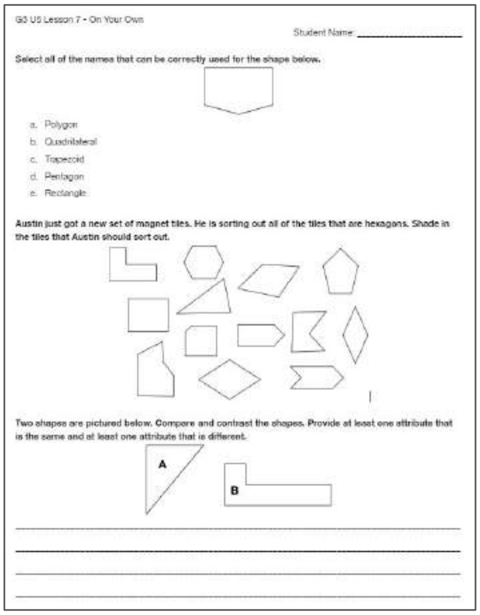
a. All hexagons have to look like stop signs.
b. All triangles must have at least one right angle.
c. A polygon is a pentagon as long as it has five sides and five angles.
d. Quadrilaterals are not examples of polygons because there are too many shapes in the family.

Two polygons are shown below. Select the statement that correctly compares and contrasts the polygons.

A B

a. Both shapes are pentagons. Shape A has acute and obtuse angles but Shape B has all right angles.
b. Shape A and Shape B do not have any sides that are congruent. Shape A has 3 pairs of parallel sides, but Shape B doesn't have any.
c. Both shapes are parallelograms. Shape A has five congruent angles, but Shape B doesn't have any.
d. Shape B has two right angles, but Shape A doesn't have any. Both shapes are hexagons.

On your Own: Let's try on our own.


G3 U5 Lesson 7 • On Your Own

Student Name: ____________

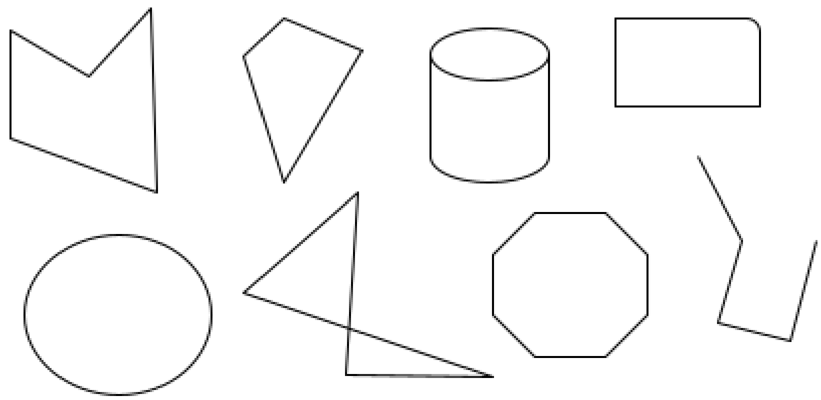
Select all of the names that can be correctly used for the shape below.

a. Polygon
b. Quadrilateral
c. Trapezoid
d. Pentagon
e. Rectangle

Austin just got a new set of magnet tiles. He is sorting out all of the tiles that are hexagons. Shade in the tiles that Austin should sort out.

Two shapes are pictured below. Compare and contrast the shapes. Provide at least one attribute that is the same and at least one attribute that is different.

Which of the following shapes are NOT polygons? Cross them out.



What attributes must a polygon have?

a. Look like a real shape and have curved sides
b. Straight sides, closed figure, no sides that cross
c. 3-dimensional, solid shapes
d. Four sides and four angles

Which of the following is a true statement?

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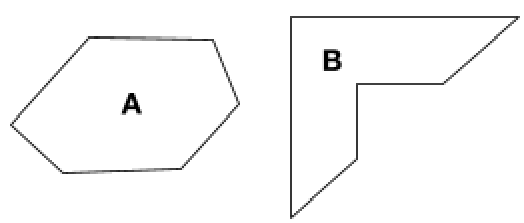
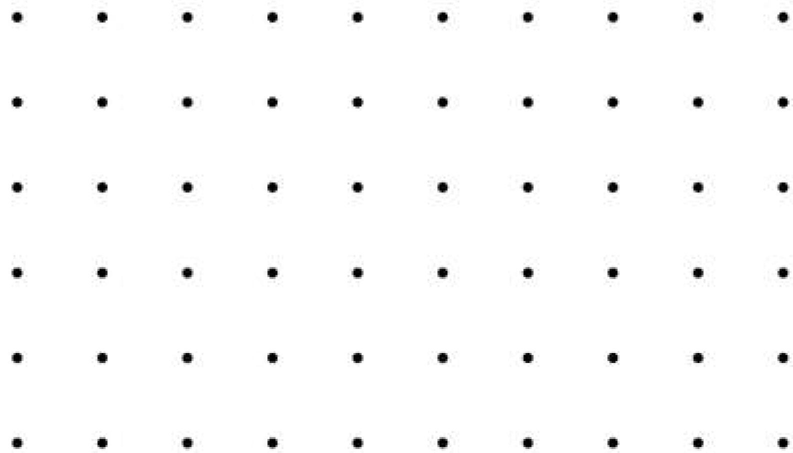
Two polygons are shown below. Select the statement that correctly compares and contrasts the polygons.



a. Both shapes are pentagons. Shape A has acute and obtuse angles but Shape B has all right angles.
b. Shape A and Shape B do not have any sides that are congruent. Shape A has 3 pairs of parallel sides, but Shape B doesn't have any.
c. Both shapes are parallelograms. Shape A has five congruent angles, but Shape B doesn't have any.
d. Shape B has two right angles, but Shape A doesn't have any. Both shapes are hexagons.

Cherish was describing a polygon to her partner. Draw a polygon to match Cherish's description. (Hint: there is more than one correct way to draw Cherish's polygon.)

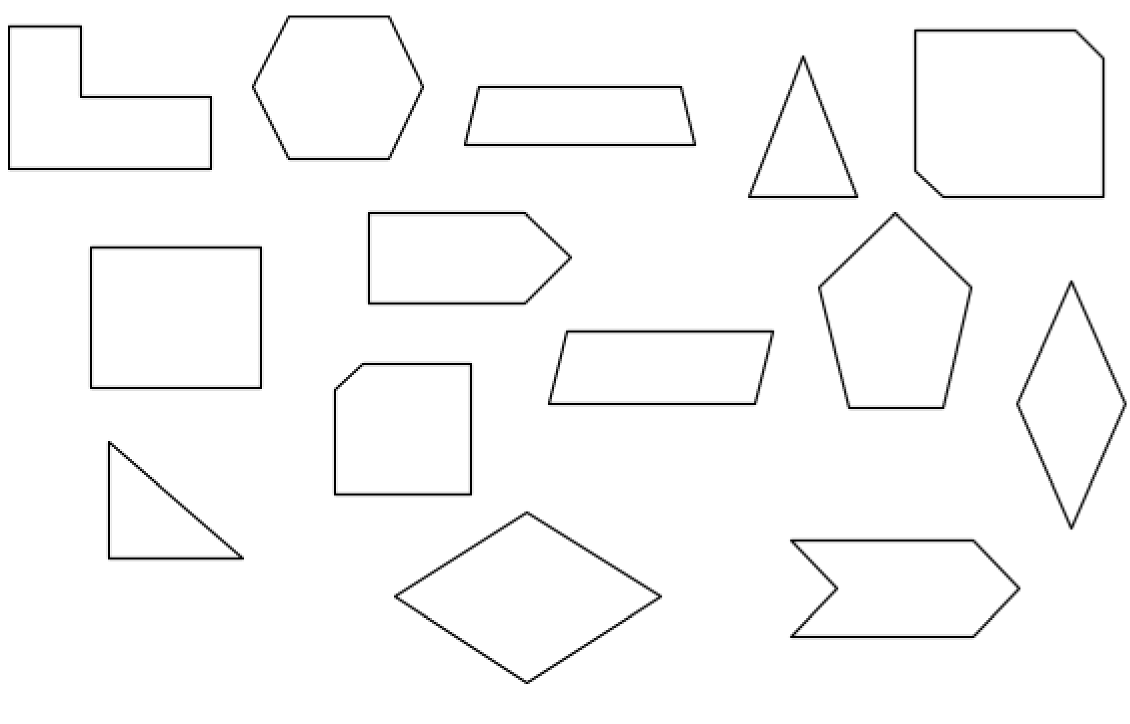
- **It has five sides and five angles.**
- **Two of the angles are right angles.**



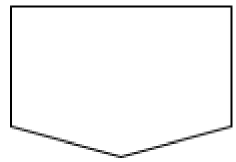
Look at the set of polygons below.

- **Mark all pentagons with the letter P.**
- **Mark all hexagons with the letter H.**

(Remember to show counting your sides and angles as proof.)



Select all of the names that can be correctly used for the shape below.



a. Polygon

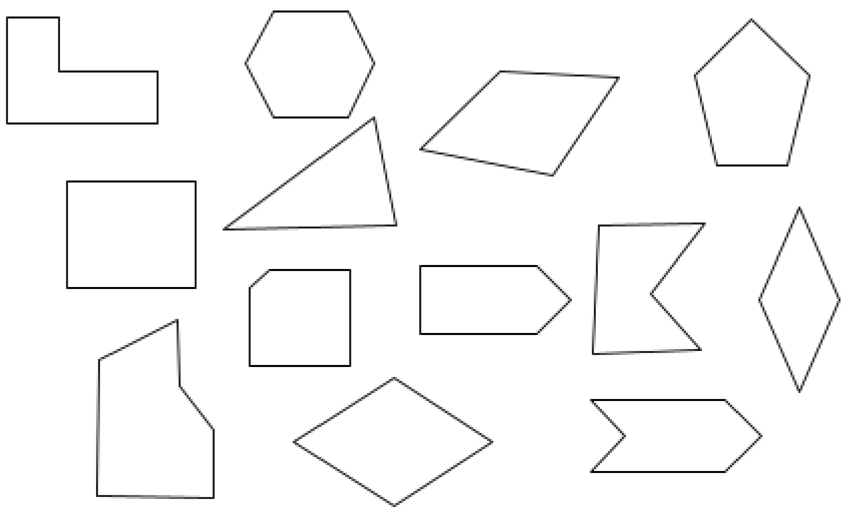
b. Quadrilateral

c. Trapezoid

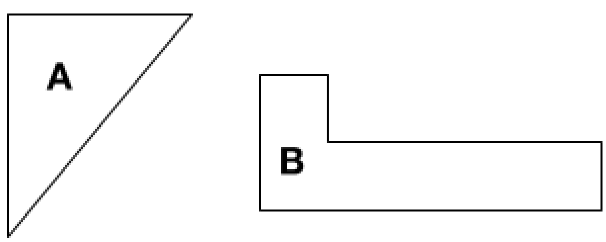
d. Pentagon

e. Rectangle

Austin just got a new set of magnet tiles. He is sorting out all of the tiles that are hexagons. Shade in the tiles that Austin should sort out.



Two shapes are pictured below. Compare and contrast the shapes. Provide at least one attribute that is the same and at least one attribute that is different.



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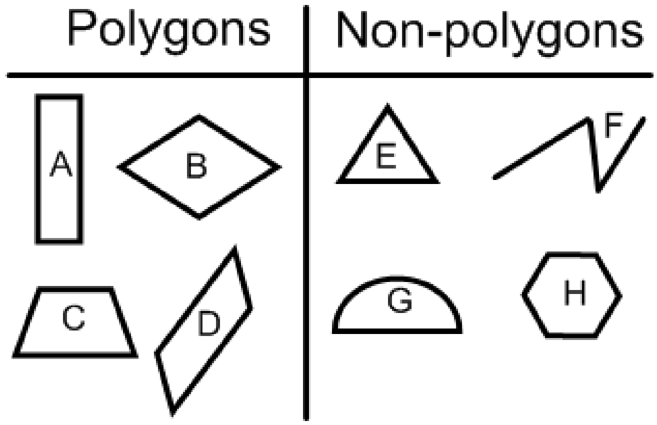
Melody's teacher asked her to make a chart and draw examples of polygons and non-polygons. Below is Melody's chart. Use her chart to answer the question below.



Melody's chart is incorrect. Which shapes are in the wrong category **and why**?

____

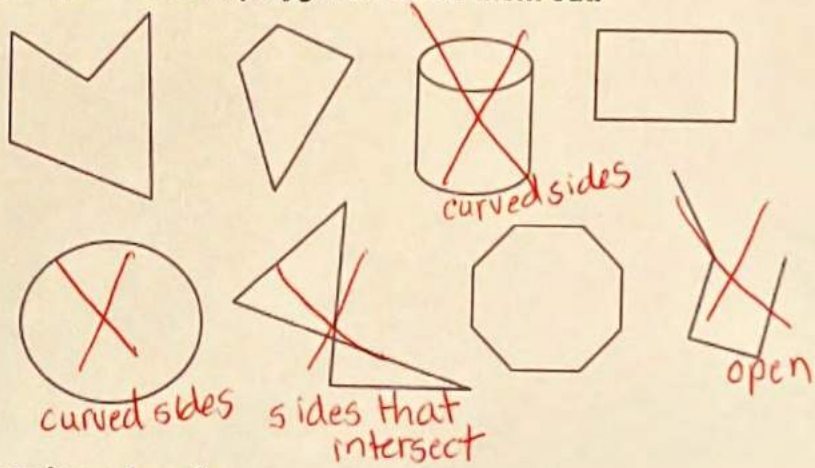
____

____

____

Student Name: ______________________ G3 U5 Lesson 7 - Let's Try It

Which of the following shapes are NOT polygons? Cross them out.



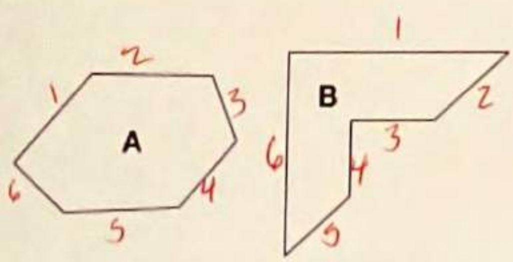
What attributes must a polygon have?

a. Look like a real shape and have curved sides
b. Straight sides, closed figure, no sides that cross
c. 3-dimensional, solid shapes
d. Four sides and four angles

Which of the following is a true statement?

a. All hexagons have to look like stop signs.
b. All triangles must have at least one right angle.
c. A polygon is a pentagon as long as it has five sides and five angles.
d. Quadrilaterals are not examples of polygons because there are too many shapes in the family.

Two polygons are shown below. Select the statement that correctly compares and contrasts the polygons.



a. Both shapes are pentagons. Shape A has acute and obtuse angles but Shape B has all right angles.
b. Shape A and Shape B do not have any sides that are congruent. Shape A has 3 pairs of parallel sides, but Shape B doesn't have any.
c. Both shapes are parallelograms. Shape A has five congruent angles, but Shape B doesn't have any.
d. Shape B has two right angles, but Shape A doesn't have any. Both shapes are hexagons.

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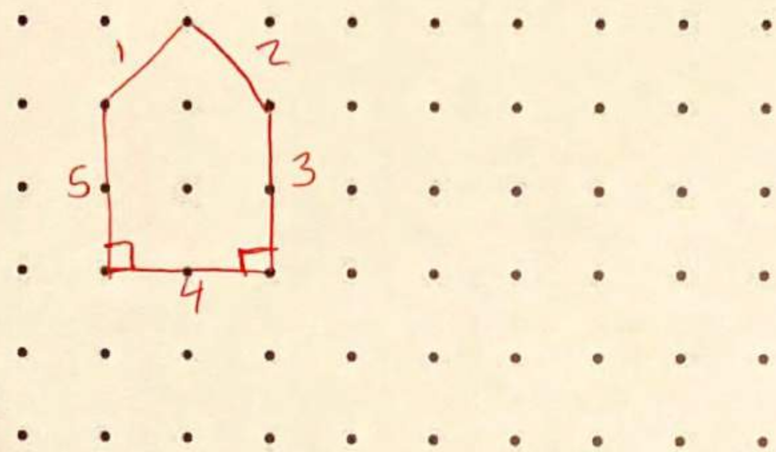
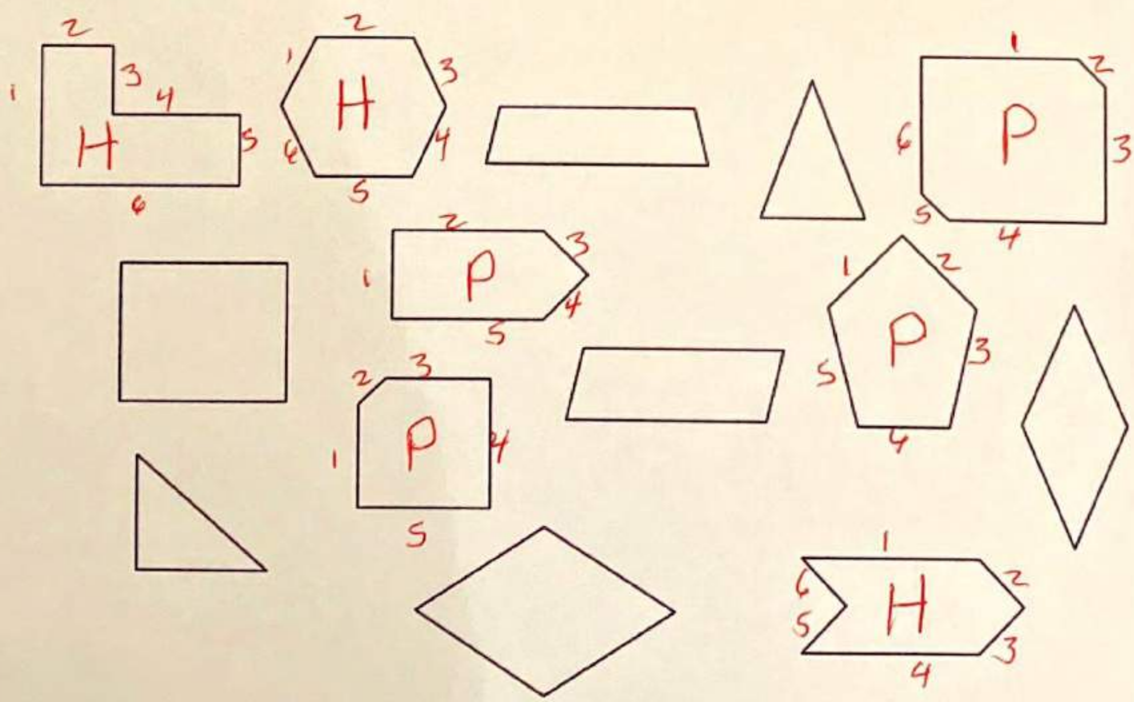
- **Two of the angles are right angles.**



Look at the set of polygons below.

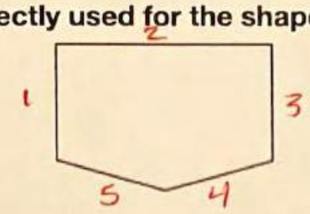
- **Mark all pentagons with the letter P.**
- **Mark all hexagons with the letter H.**

(Remember to show counting your sides and angles as proof.)



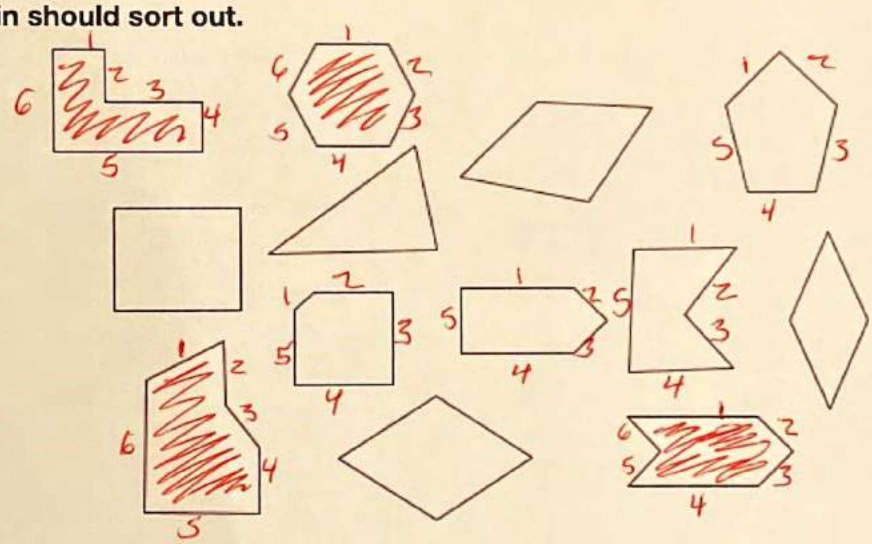
Student Name: Answer Key G3 U5 Lesson 7 - Independent Work

Select all of the names that can be correctly used for the shape below.

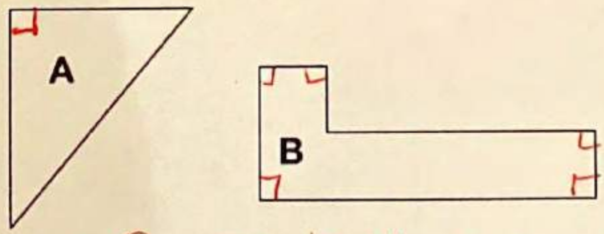


a. Polygon
b. Quadrilateral
c. Trapezoid
d. Pentagon
e. Rectangle

Austin just got a new set of magnet tiles. He is sorting out all of the tiles that are hexagons. Shade in the tiles that Austin should sort out.

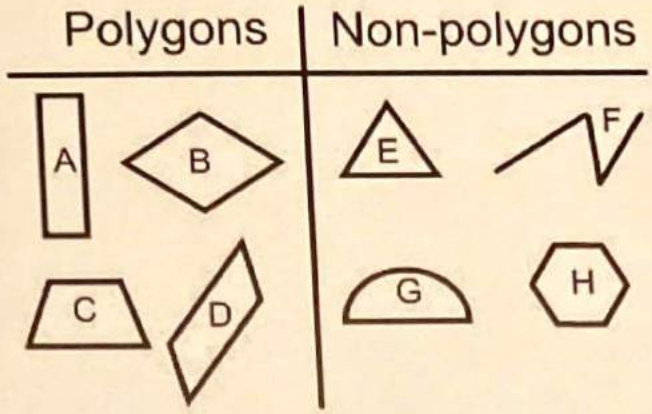


Two shapes are pictured below. Compare and contrast the shapes. Provide at least one attribute that is the same and at least one attribute that is different.



Shape A and Shape B are both polygons with at least one right angle. Shape A only has 3 sides and is a triangle, but Shape B has 6 sides and is a hexagon.

Melody's teacher asked her to make a chart and draw examples of polygons and non-polygons. Below is Melody's chart. Use her chart to answer the question below.



Melody's chart is incorrect. Which shapes are in the wrong category **and why**?

Shapes E and H are in the wrong category. They are closed figures with straight sides that do not cross, so they should be in the polygon group.

G3 U5 Lesson 8

Measure to find perimeter

CITYTUTOR DC

G3 U5 Lesson 8 - Students will measure side lengths of polygons to determine perimeter

Tutor Notes: The final three lessons of this unit will focus on applying some of the understandings of shape attributes to being able to determine the perimeter of given polygons. For example, if a student understands that a rhombus has four congruent sides, they will still be able to calculate the perimeter of the shape if given one side length. Perimeter is a new concept in the third grade. Students will have prior exposure to area, so they already should understand that area is the space inside a shape or what the shape covers. Perimeter is the distance around the shape, and we can determine perimeter by adding all of the side lengths together. Students should also understand real-world contexts for perimeter such as building a fence, picture frames, adding a border onto a project, or painting boundary lines on a field.

In Lesson 8, students will work primarily with determining side lengths by counting the square units on a grid and/or using a ruler to measure side lengths to the nearest inch.

Materials:
- Grid paper
- Printable rulers

Warm Welcome (Slide 1): Tutor choice

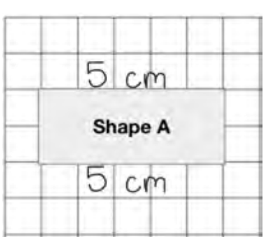
Frame the Learning/Connect to Prior Learning (Slide 2): We have spent a lot of lessons together learning about the attributes of polygons that we use to describe and classify them. Our understanding of some of those attributes, like congruent sides, is going to really help us with the next skill that we learn together, perimeter. You probably have already learned about area in your class or in an earlier tutoring unit, so you know that area is the space inside a shape, we can find the area of a rectangle or square by multiplying length times width. Perimeter is the distance around a shape and we find it by adding all of our side lengths together. We are going to spend the next few lessons working with perimeter, when we see it in the real world, and how to find it if we aren't given our side lengths.

Let's Review (Slide 3): Let's take a look at some of the polygons on the screen. We learned important attributes about these polygons in our previous lessons. Take a moment to think back about what we learned specifically about their congruent sides. When you're ready, remind me, **what did we learn about the congruent sides of Shape A? What is Shape A called?** Shape A is a rectangle. It has opposite sides congruent. The top and bottom are congruent and the two sides are congruent.

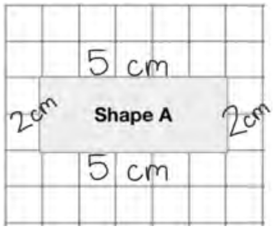
Great! How about Shape B? **What do we know about congruent sides in Shape B?** Shape B is a square. It has four congruent sides.

Awesome remembering! **What do you remember about congruent sides in Shape C?** Shape C is a rhombus. It also has four congruent sides. Excellent! So remembering those congruent sides in the shapes is going to help us out a lot when we are trying to find the perimeter of polygons.

Let's Think (Slide 4): Sometimes we may see polygons shown to us on a square grid to help us determine the side lengths. We already talked about side lengths when we were exploring area.



Let's look at the rectangle together. Let's find the length of the top of the rectangle first. We can count how many centimeters it is. Count with me…1, 2, 3, 4, 5 (*point and count*). *And,* what would the bottom side length be? The bottom is also 5 centimeters because I know the top and bottom of rectangles are congruent.



Okay, now let's find the length of the sides! Count with me…1, 2! So both sides of the rectangle are 2 cm, let's label them.

Nice! Now that we know all of our dimensions or side lengths, we are ready to find perimeter!

Perimeter is the distance around the OUTSIDE of a shape. For example, if I wanted to put a fence around this rectangle, I would have to measure around the outside (*trace finger around outside*). And, I find perimeter by adding all of the side lengths together, so what would my equation be to find perimeter? 5 + 5 + 2 + 2 or 5 + 2 + 5 + 2!

That's right, because we need to add all of the sides together (*point*). So, let's all take a moment to solve for the perimeter. When you have it, give me a thumbs up. The perimeter is 14 centimeters. Great job! I agree with you.

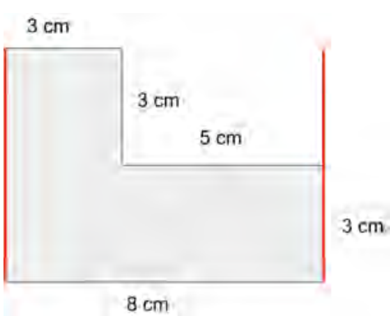
Let's Talk (Slide 5): Sometimes we will not be given a grid to help us figure out side lengths. Sometimes the lengths will be labeled for us, or sometimes we may even have to use a ruler to help us measure the lengths. Here, it looks like we have ONE side length and it's asking us to find the perimeter of the square. Hmmm, **how can we find the perimeter of the square?** Possible Student Answers, Key Points:

- Squares have congruent sides so it's 5 all around.
- Squares have sides that are all the same length so if we know one side, we know the rest of the sides.
- We can just add 5 and 5 and 5 and 5 since the side lengths are all the same.
- We can't, we don't have the other sides!

Oh, I hear some interesting ideas! It sounds like some of us are using what we know about squares to help us find the perimeter. So, **what do we know about squares? What's special about squares?** They have 4 equal sides! That's right, all four sides of a square are the exact same length. So if we know one side, we also know the other sides.

Great, so take a moment to calculate the perimeter of the square and then we'll share out. So, what's the perimeter?The perimeter of the square is 20 units!

Let's Think (Slide 6): We are off to a great start understanding perimeter. Let's take a look at a different type of shape to see if we can figure out the dimensions and the perimeter. Before we get started with measurements for this shape, let's first figure out how many sides the shape has. The shape has 6 sides so it is a hexagon. Excellent, so we want to make sure that since the shape has six sides, we have six measurements to be able to find the perimeter of the shape.



But, uh oh! We're missing one of the sides! This is reminding me of some of the work we did in our area unit, how can we find the missing side (*point).* Well, we know that these two sides are congruent of the same (*draw lines*).

The right long side is made up of 3 cm and 3 cm so that means that the whole length of this side is 6 cm.

Now we can go ahead and write an equation below the shape that shows me how you will calculate perimeter…3 + 3 + 5 + 3 + 8 + 6 = _______ cm

Let's both add it up and see what we get! The perimeter is 28 centimeters. (*Always encourage the student to include the units with their responses.)*

Let's Try it (Slide 7): Now we are going to work to apply our understanding of perimeter to some practice. Remember, sometimes we will be given a grid that can help us count units to find the side lengths, but sometimes we will need to measure to find the dimensions. We also need to use our understanding of attributes and congruent sides to help us figure out side lengths of some polygons. Then, once we know all of our side lengths, we can add them up to find the perimeter, or the distance around the shape.

WARM WELCOME

Today we will measure side lengths of polygons to determine perimeter.

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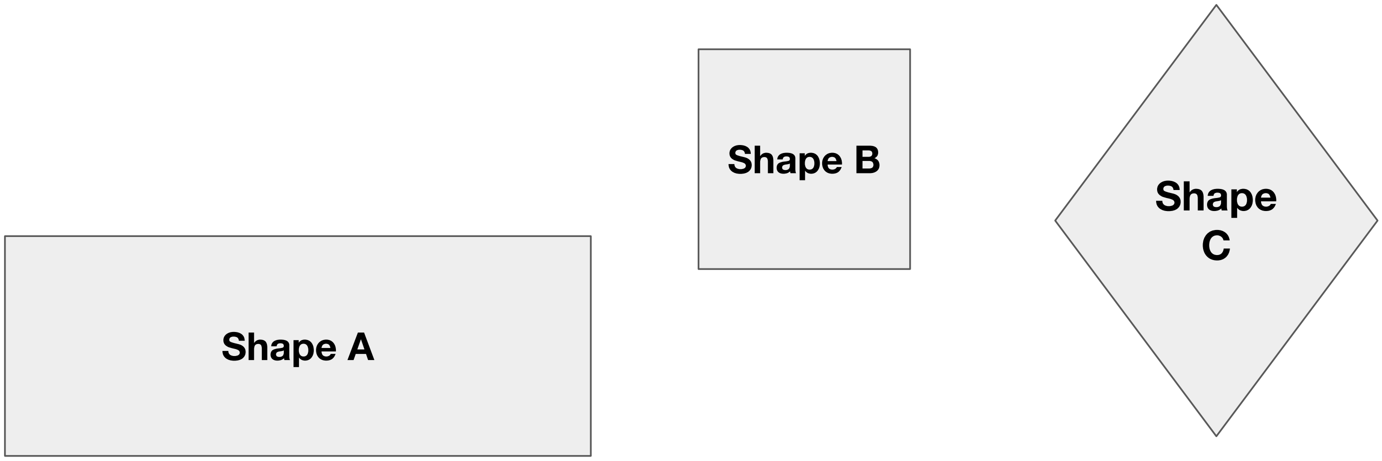
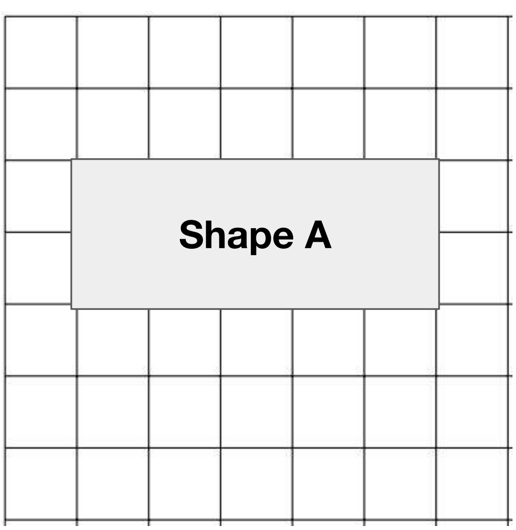
Let's Review: What is congruent?



Let's Think:

If each square is 1 centimeter, what are the dimensions or side lengths of the rectangle?

What would the perimeter be?



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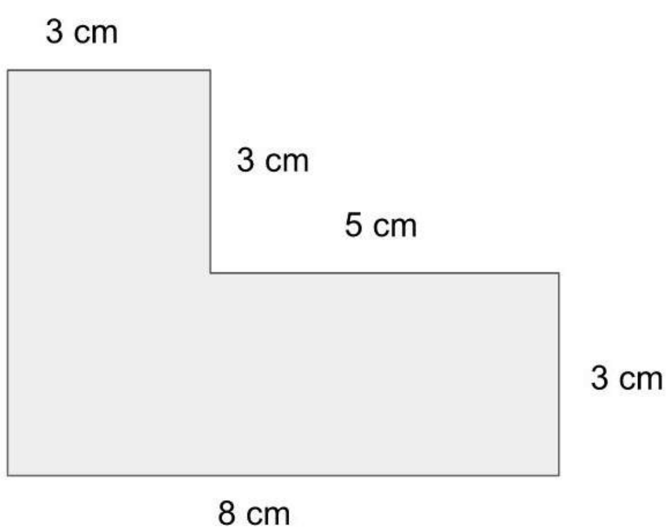
Let's Think:

What is the perimeter of the square?

Let's Think:

Let's find the perimeter.



Let's Try It:

Let's apply our understanding together.

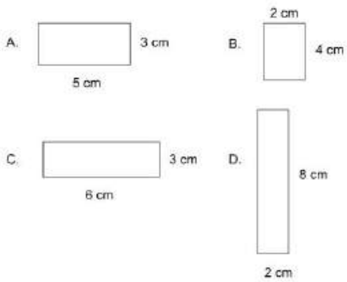
G3 U5 Lesson 8 - Let's Try It

Student Name: ______________

1. How do you calculate the perimeter of a polygon?
   a. Multiply length times width
   b. Multiply length times width times height
   c. Find the area and then subtract the longest side
   d. Add all of the side lengths together

2. If one side of a rhombus measures 5 centimeters, what is true about the other side lengths?
   a. They all must be greater than 5 centimeters.
   b. They all will be equal to 5 centimeters.
   c. They all will add to a total of 5 centimeters.
   d. You have to measure each side with a ruler to find out.

3. Which of the following rectangles has a perimeter of 12 centimeters? (Hint: Don't forget that a rectangle is a quadrilateral! There are **four sides** to consider.)



On your Own:

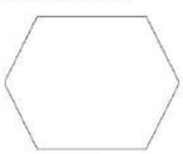
Let's try on our own.

G3 U5 Lesson 8 - On Your Own

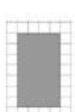
Student Name: ______________

1. Which of the following are important things to remember when you are measuring with a ruler? Select two correct statements.
   a. Always start at the 1 inch mark on the ruler.
   b. Make sure to line up the end point of the object with the "zero" mark on the ruler.
   c. Start measuring in the middle of your object.
   d. Make sure to choose the correct side of the ruler, inches or centimeters, based on the problem.

2. Use the **inch** side of your ruler to measure the hexagon below. Label each side length, and then find the perimeter of the hexagon.



3. Which of the following statements is true?
   a. The sides of a rectangle are all congruent.
   b. If the side of a square measures 4 inches, all of the sides have to be four inches.
   c. The sides of a triangle always have to have a total perimeter of 12 inches.
   d. If one side of a hexagon measures 8 centimeters, all of the sides have to be 8 centimeters.



4. What is true about the side lengths in a rectangle?
   a. The opposite side lengths in a rectangle are congruent.
   b. All four side lengths in a rectangle will be the same.
   c. You have to measure each side length in a rectangle.
   d. The length of the top will always be equal to the length of the side.

Name: ____

1. How do you calculate the perimeter of a polygon?

    a. Multiply length times width
    b. Multiply length times width times height
    c. Find the area and then subtract the longest side
    d. Add all of the side lengths together

2. If one side of a rhombus measures 5 centimeters, what is true about the other side lengths?

    a. They all must be greater than 5 centimeters.
    b. They all will be equal to 5 centimeters.
    c. They all will add to a total of 5 centimeters.
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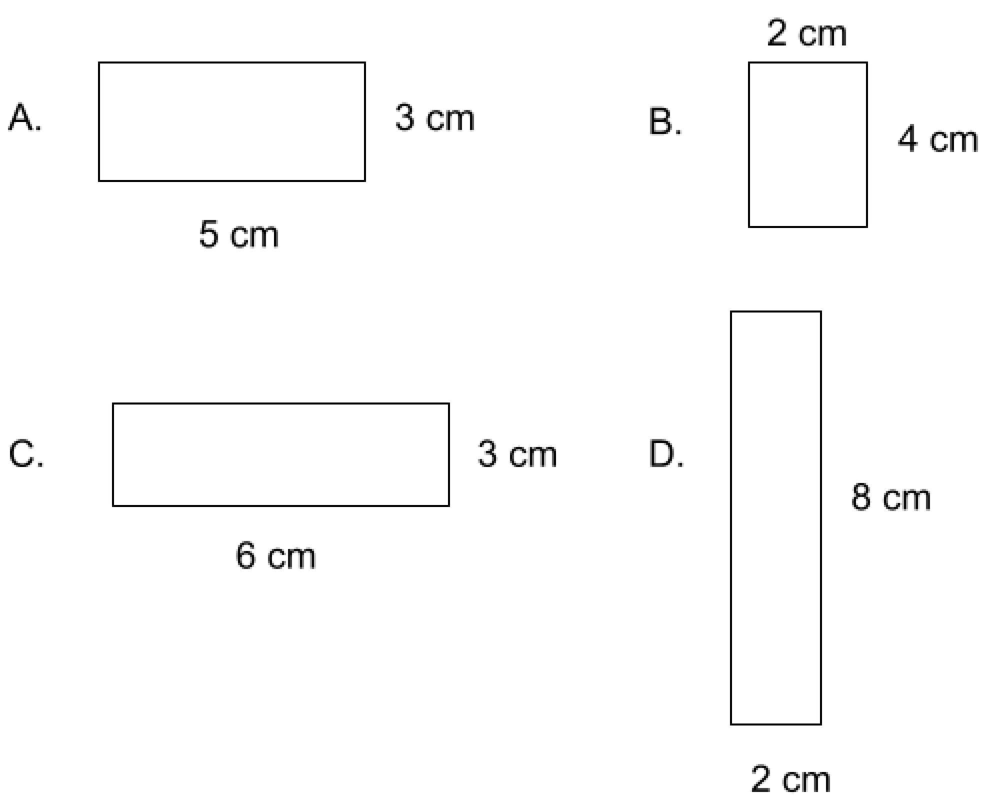
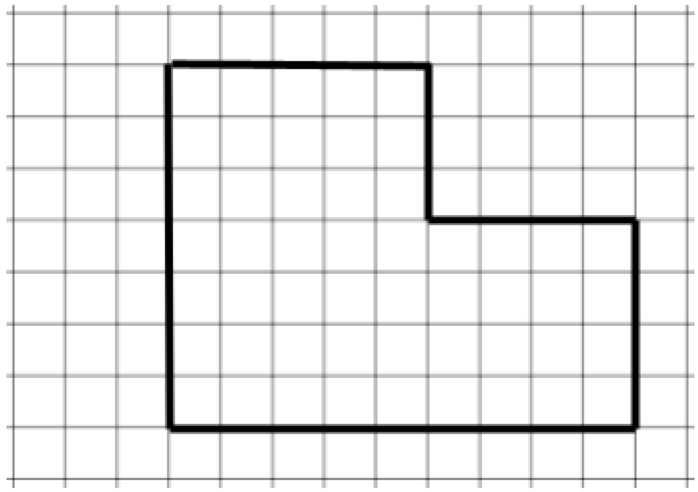


4. Miguel and Victor are planting a vegetable garden in their backyard, pictured below. However, they have a big problem with rabbits eating their plants.



Part A: They want to put a fence up around the garden to protect the vegetables. If each unit represents 1 foot, how many feet of fencing should Miguel and Victor put up? (Remember to label your side lengths in the model.)

Part B: Which expression matches what you did to solve Part A?

a. (7 x 9) + (4 x 4)

b. 10 + 8 + 5 + 5 + 4 + 4

c. 7 + 9 + 4 + 4 + 3 + 5

5. Use your centimeter ruler to measure the side lengths of the shape below to the nearest whole centimeter. Label the side lengths and then calculate the perimeter of the shape.

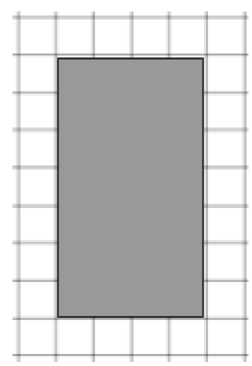
1. Which of the following are important things to remember when you are measuring with a ruler? Select two correct statements.

    a. Always start at the 1 inch mark on the ruler.
    b. Make sure to line up the end point of the object with the “zero” mark on the ruler.
    c. Start measuring in the middle of your object.
    d. Make sure to choose the correct side of the ruler, inches or centimeters, based on the problem.

2. Which of the following statements is true?

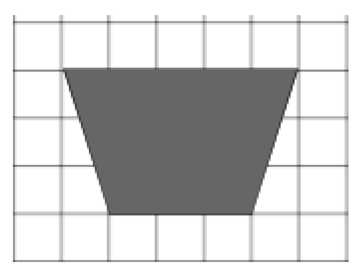
    a. The sides of a rectangle are all congruent.
    b. If the side of a square measures 4 inches, all of the sides have to be four inches.
    c. The sides of a triangle always have to have a total perimeter of 12 inches.
    d. If one side of a hexagon measures 8 centimeters, all of the sides have to be 8 centimeters.

3. What is true about the side lengths in a rectangle?

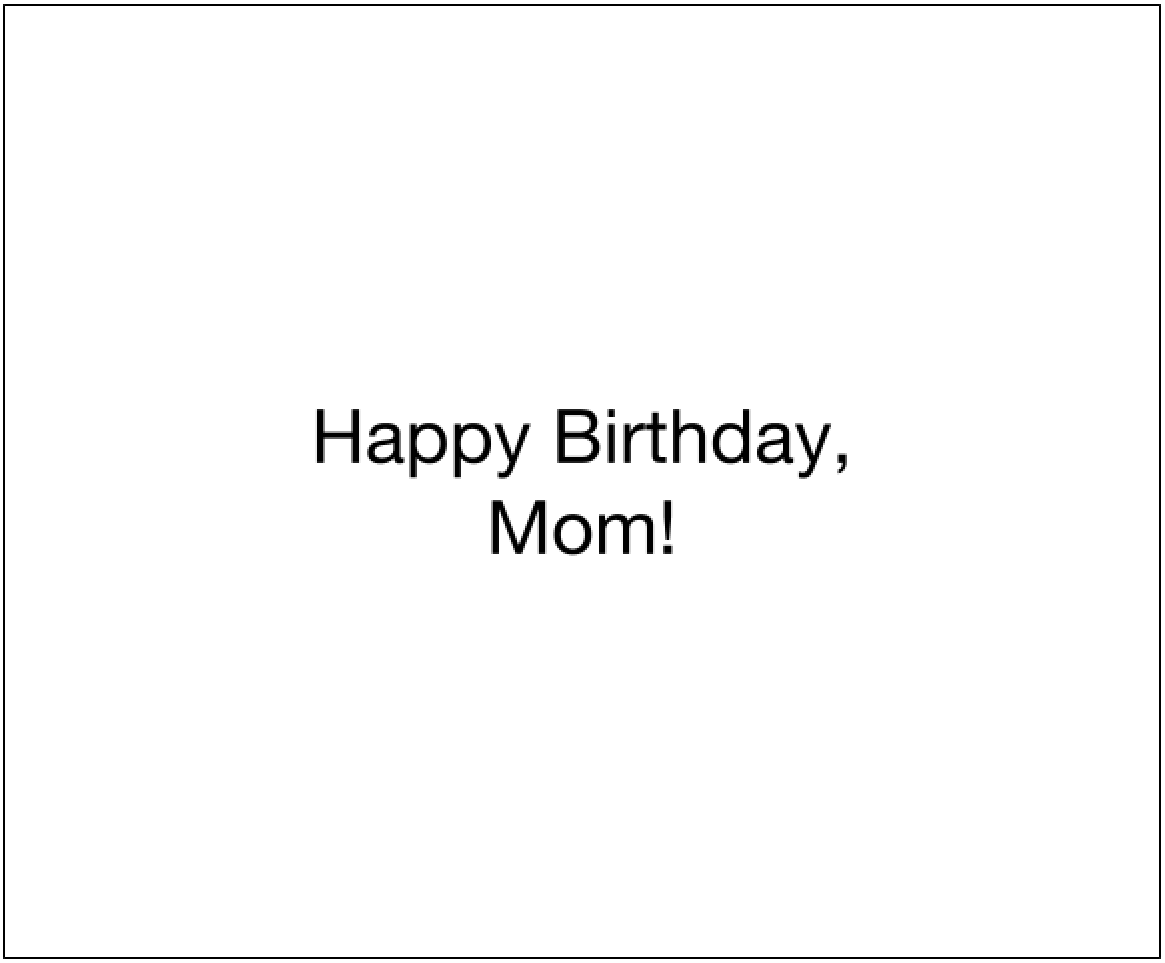


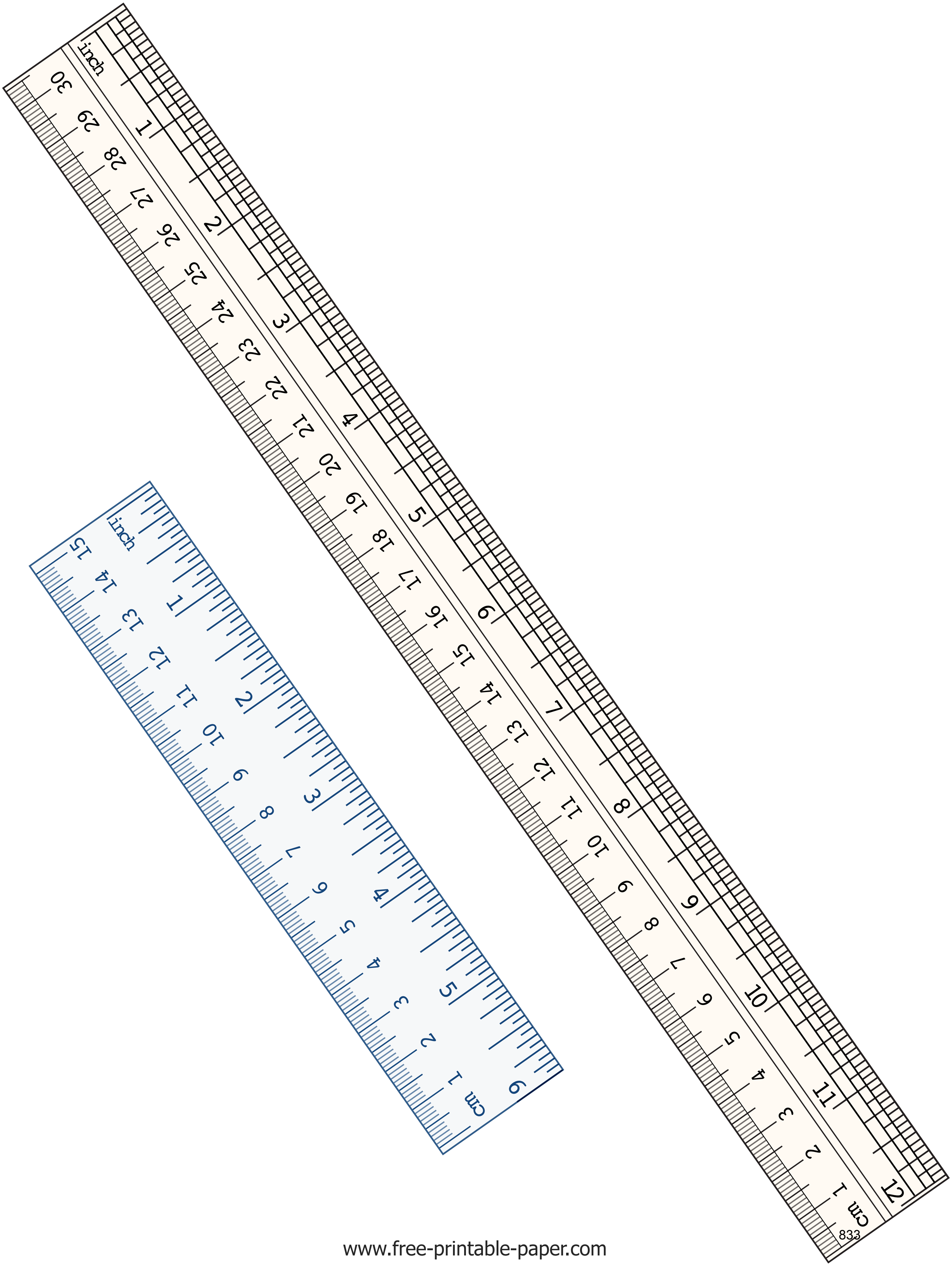
    a. The opposite side lengths in a rectangle are congruent.
    b. All four side lengths in a rectangle will be the same.
    c. You have to measure each side length in a rectangle.
    d. The length of the top will always be equal to the length of the side.

4. Label the side lengths of the trapezoid, using the grid to help you. Then, use the space below to show your work to find the perimeter of the trapezoid.



5. Tanisha made a small birthday card for her mother. The actual size of the card is pictured below. She wants to put sequins around the whole border of the card. How many inches of sequins will Tanisha use on the card?
6.
    a. Measure the dimensions of the card in inches.
    b. Label your side lengths.
    c. Calculate to find out how many inches of sequins Tanisha will use.




inch
cm
833
inch
cm

1 cm Graph Paper

One line per centimeter. Black lines.

Student Name: Answer Key

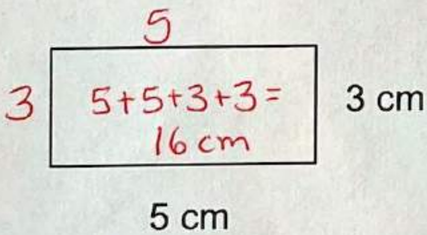
1. How do you calculate the perimeter of a polygon?

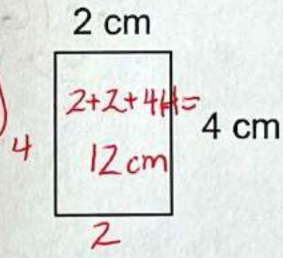
   a. Multiply length times width
   b. Multiply length times width times height
   c. Find the area and then subtract the longest side
   d. Add all of the side lengths together

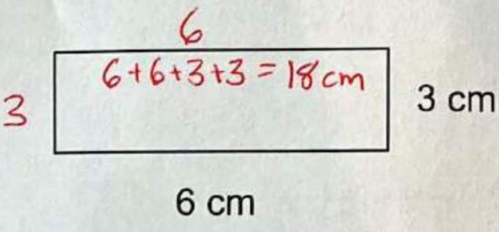
2. If one side of a rhombus measures 5 centimeters, what is true about the other side lengths?

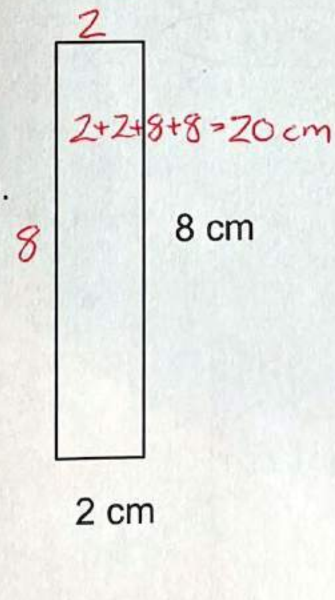
   a. They all must be greater than 5 centimeters.
   b. They all will be equal to 5 centimeters.
   c. They all will add to a total of 5 centimeters.
   d. You have to measure each side with a ruler to find out.

3. Which of the following rectangles has a perimeter of 12 centimeters? (Hint: Don't forget that a rectangle is a quadrilateral! There are **four sides** to consider.)

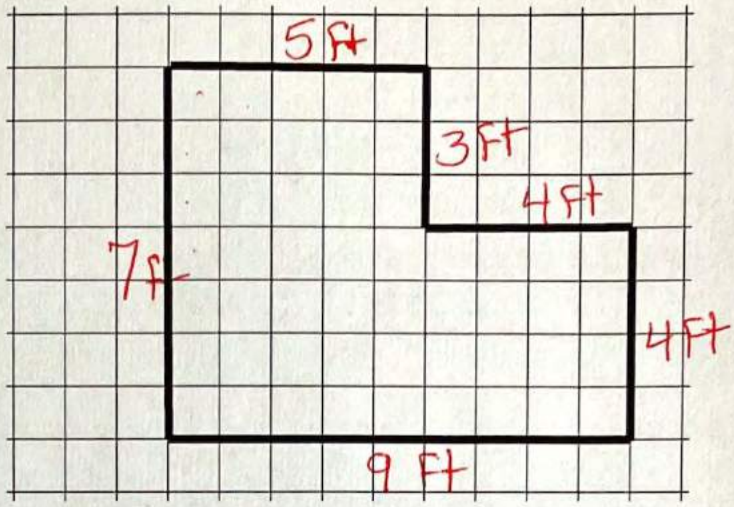
A.


B.


C.


D.


4. Miguel and Victor are planting a vegetable garden in their backyard, pictured below. However, they have a big problem with rabbits eating their plants.



Part A: They want to put a fence up around the garden to protect the vegetables. If each unit represents 1 foot, how many feet of fencing should Miguel and Victor put up? (Remember to label your side lengths in the model.)

9 ft + 7 ft + 5 ft + 3 ft + 4 ft + 4 ft = 32

16 + 8 + 8

16 + 16

32 ft

32 Feet of fence

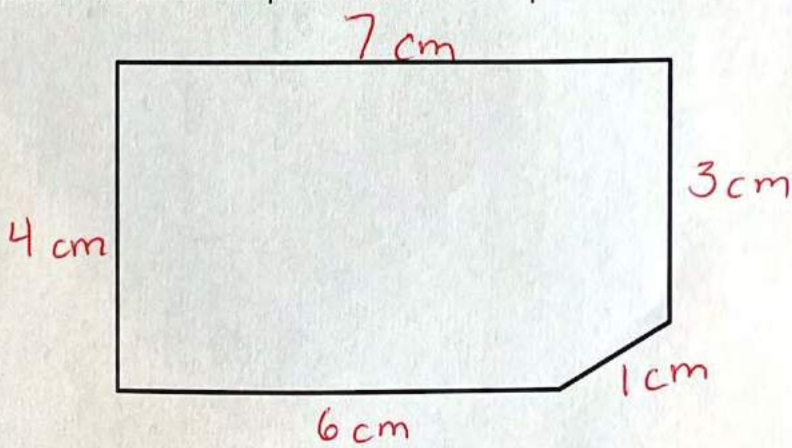
Part B: Which expression matches what you did to solve Part A?

a. (7 x 9) + (4 x 4)

b. 10 + 8 + 5 + 5 + 4 + 4

c. 7 + 9 + 4 + 4 + 3 + 5

5. Use your centimeter ruler to measure the side lengths of the shape below to the nearest whole centimeter. Label the side lengths and then calculate the perimeter of the shape.



7 + 3 + 1 + 6 + 4 = 21 cm

10 + 1 + 10

Student Name: Answer Key

G3 U5 Lesson 8 - Independent Work

1. Which of the following are important things to remember when you are measuring with a ruler? Select two correct statements.

   a. Always start at the 1 inch mark on the ruler.

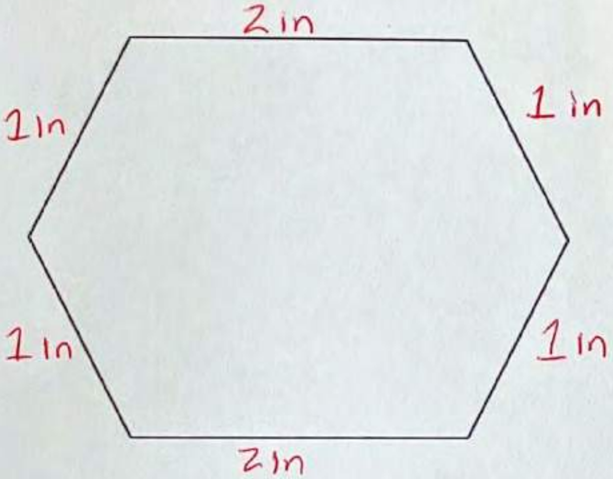
   b. Make sure to line up the end point of the object with the "zero" mark on the ruler.

   c. Start measuring in the middle of your object.

   d. Make sure to choose the correct side of the ruler, inches or centimeters, based on the problem.

2. Use the **inch** side of your ruler to measure the hexagon below. Label each side length, and then find the perimeter of the hexagon.

Have student measure to the nearest inch.



$2 + 1 + 1 + 2 + 1 + 1 = 8$ inches

$P = 8$ inches

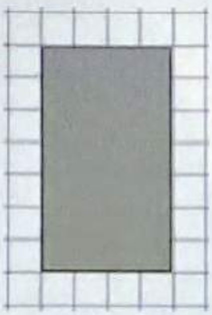
3. Which of the following statements is true?

   a. The sides of a rectangle are all congruent.

   b. If the side of a square measures 4 inches, all of the sides have to be four inches.

   c. The sides of a triangle always have to have a total perimeter of 12 inches.

   d. If one side of a hexagon measures 8 centimeters, all of the sides have to be 8 centimeters.



4. What is true about the side lengths in a rectangle?

   a. The opposite side lengths in a rectangle are congruent.

   b. All four side lengths in a rectangle will be the same.

   c. You have to measure each side length in a rectangle.

   d. The length of the top will always be equal to the length of the side.

5. Tanisha made a small birthday card for her mother. The actual size of the card is pictured below. She wants to put sequins around the whole border of the card. How many inches of sequins will Tanisha use on the card?

↳ perimeter

a. Measure the dimensions of the card in inches.

b. Label your side lengths.

c. Calculate to find out how many inches of sequins Tanisha will use.

6 in.

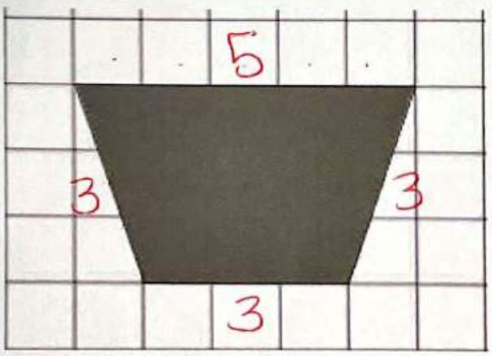
5 in

Happy Birthday,
Mom!

5 in

6 + 5 + 6 + 5 = 22 inches of sequins

6 in



6. Label the side lengths of the trapezoid, using the grid to help you. Then, use the space below to show your work to find the perimeter of the trapezoid.

5 + 3 + 3 + 3 = 14 units

P = 14 units

G3 U5 Lesson 9

Determine perimeter of polygons

CITYTUTOR DC

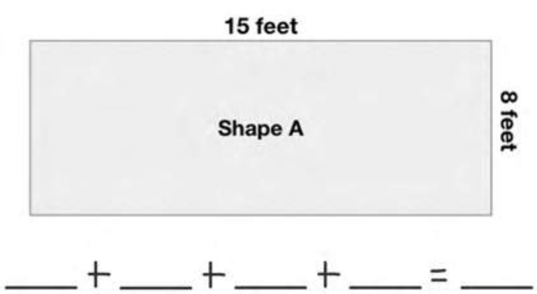
G3 U5 Lesson 9 - Students will calculate the perimeter of polygons.

Tutor Notes: The primary misconception that students demonstrate around perimeter is when sides of the given polygon are not explicitly labeled. The missing side lengths can either be determined by applying understanding of attributes of the shape such as all congruent sides or opposite congruent sides, or decomposing the composite shape into two or three smaller, simpler shapes (like students did in the area unit) and using other given side lengths to fill in the missing parts. One way to support students in preventing this misconception is first beginning by determining how many sides the shape has and writing an equation with blank lines to represent each side totaled together. Then, the student can fill in the given lengths and apply their other understanding to determine the missing lengths. This can help prevent them from inadvertently missing a side when calculating perimeter.

Warm Welcome (Slide 1): Tutor choice

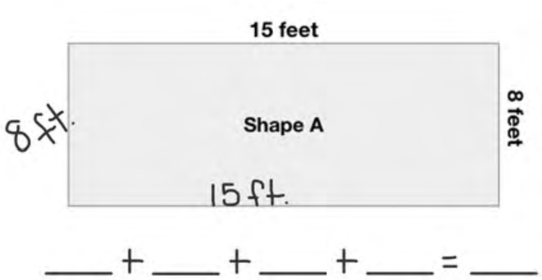
Frame the Learning/Connect to Prior Learning (Slide 2): Last time we met, we learned about perimeter. Remember that perimeter is the distance around a shape like the boundary lines on a sports field, the border on a bulletin board at school, or the sidewalk around a park. We can calculate perimeter by adding all of the side lengths together. Today, we will continue to explore perimeter.

Let's Review (Slide 3): Notice that the shape does not have all of its side lengths labeled, so in order to determine perimeter for this shape, I have to consider what I understand about the attributes of the shape. Let's start by looking at Shape A. First, how many sides does Shape A have? Shape A has 4 sides.



So I know that when I am finding the perimeter of Shape A, I'm going to have to add four side lengths together. To help myself remember that, I am going to set up this equation to make sure I don't miss any of the side lengths.

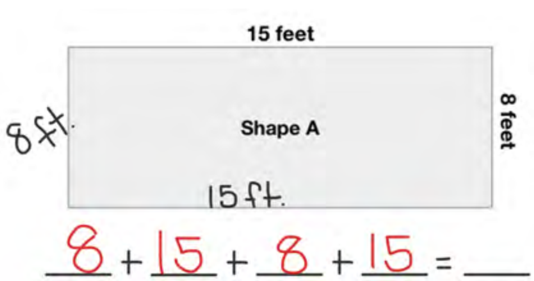
Now, what type of polygon is Shape A? Shape A is a rectangle.



Exactly, so what do we know about rectangles that can help me determine what the other side lengths would be? Possible Student Answers, Key Points:

- A rectangle has opposite sides congruent.
- The top and bottom would be the same, so the bottom would be 15 feet too. The sides are also the same so the other side would be 8 feet.

That's right, we know that opposite sides of rectangles are congruent.



So now that I figured that out, how would I find the perimeter? Add all the side lengths together. Add 15 + 15 + 8 + 8.

Nice work, so when we would add that up, we would get a perimeter of 46 feet.

Let's Talk (Slide 4): Let's look at Shapes B and C on this slide. We are going to find the perimeter of each shape. Shape B is another rectangle, so what do I need to do to find the perimeter of Shape B? You know the bottom would also be 14 inches and the other side would be 8 inches. Then you can add up all four sides so 14 + 14 + 8 + 8. *(Encourage the student to label the side lengths and write out the equation while they are explaining.)* So, what is the perimeter of Shape B? The perimeter is 44 inches.

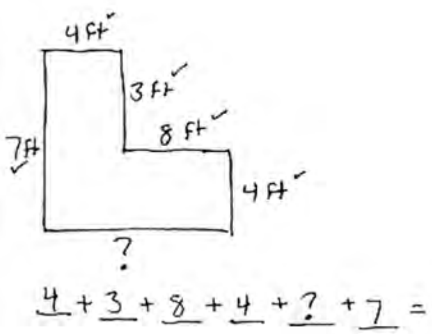
Great! Let's take a look at Shape C. How many sides does Shape C have?Shape C has 4 sides.

What type of polygon is Shape C? Shape C is a rhombus. How might we figure out the other side lengths for Shape C? Rhombuses have four congruent sides, so we know all of the sides are 11 inches.

Ok, so how can we use that understanding to calculate perimeter? We can add 11 + 11 + 11 + 11 or we can think 4 x 11 since all four sides are the same.

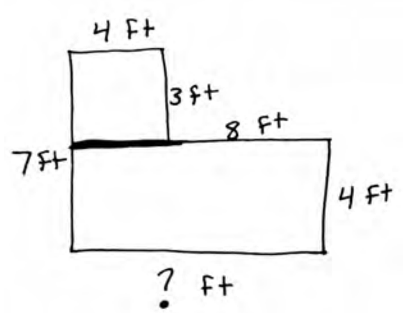
Oh interesting! So the rhombus also has a perimeter of 44 inches. So shapes can have different dimensions but the same perimeter.

Let's Think (Slide 5): Now we are going to look at another type of irregular shape with a missing side length. Let's start by counting the sides to see how many side lengths we need to have in our equation.



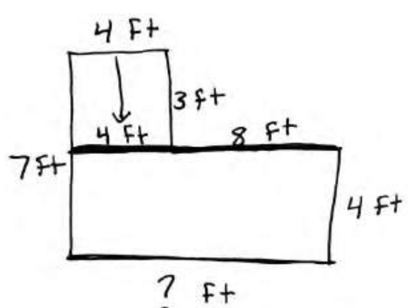
So we know we have six sides, but our bottom side length is missing. *(Model writing out the equation with the six blanks. Known side lengths can be filled in.)*

We need to decompose or break down the shape into smaller parts to help us figure out the missing side. What smaller shape do you see within this shape? I see rectangles.



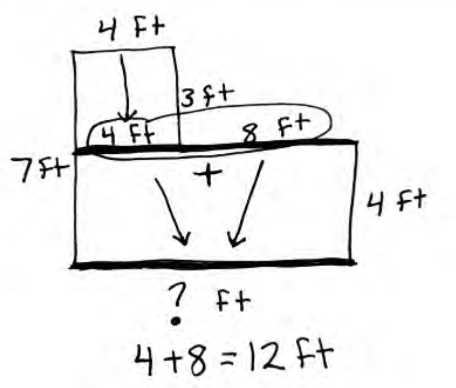
Great - we can see two rectangles within this shape. We can split it vertically or horizontally. We are going to split it horizontally to help us see what the bottom side length will be.

Now that we have two smaller rectangles, we can use what we know about the attributes of rectangles to help us. Remember that opposite sides in a rectangle are congruent. So what other lengths do we see in the shape that can help us? In the smaller rectangle at the top, we know the top side is 4 feet, so that means the smaller part of the horizontal cut would be 4 feet.

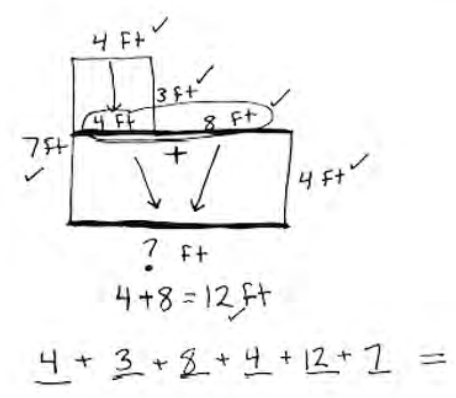


Ok, now let's think about the bigger rectangle we created on the bottom. Now, what do you notice about the length of the top of that rectangle? We know that one part is 4 feet and the other part is 8 ft.

How might that help us figure out the missing length at the bottom of that rectangle? I know that opposite sides in the rectangle are congruent, so if the top is 4 ft and 8 ft, that means the bottom would be the same length. 8 + 4 = 12, so the bottom length is 12 feet.



So we started off with a missing side length, we decomposed the shape into two smaller rectangles, and used our understanding of the attributes of rectangles to find the missing side length. That was hard work, but we aren't done yet! Now that we have found our missing side, what do we need to do in order to find a perimeter? We need to add all of the side lengths together.



Let's revisit the equation we wrote at the very beginning of this problem when we counted six sides in our polygon. We filled in the sides we already knew, so now we just need to fill in our missing side and calculate the perimeter. The total perimeter is 38 feet.

Great job. Finding missing side lengths in irregular shapes is a really tough skill, and you did a great job working through that with me!

Let's Try it (Slides 6-7): Now we are going to practice finding the perimeter of polygons together. Remember to start by counting the number of sides in the polygon so we make sure we find any missing side lengths before calculating the perimeter.

WARM WELCOME

Today we will calculate the perimeter of polygons.

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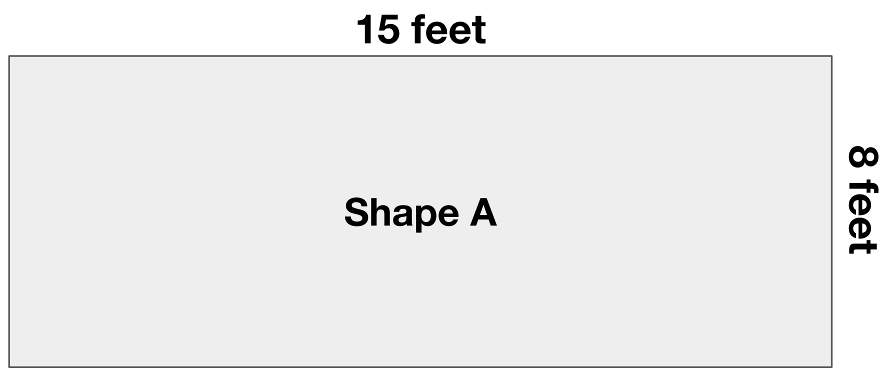
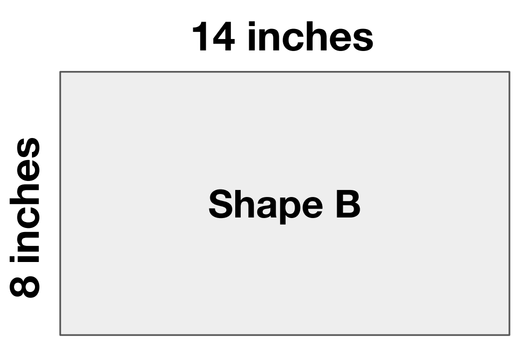
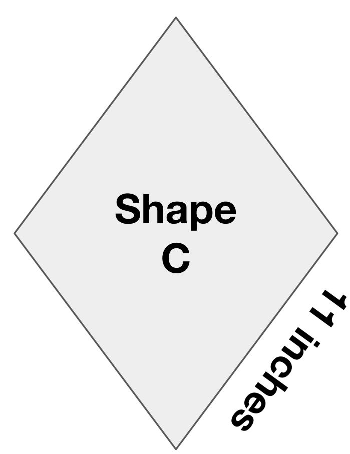
Let's Review: How do we find perimeter?



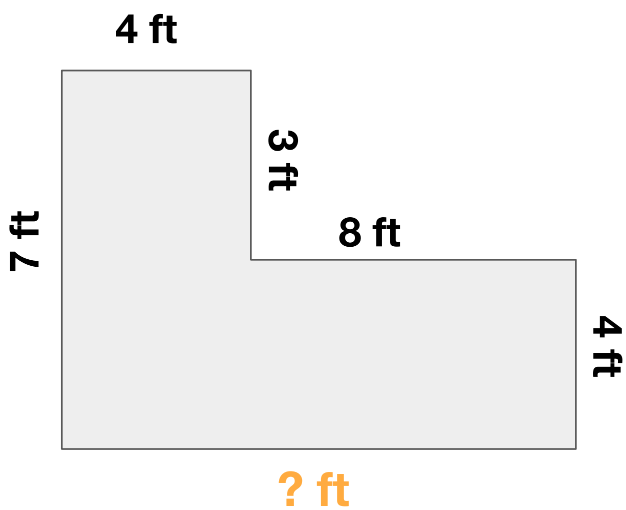
Let's Talk: Find the perimeters. What do you notice?





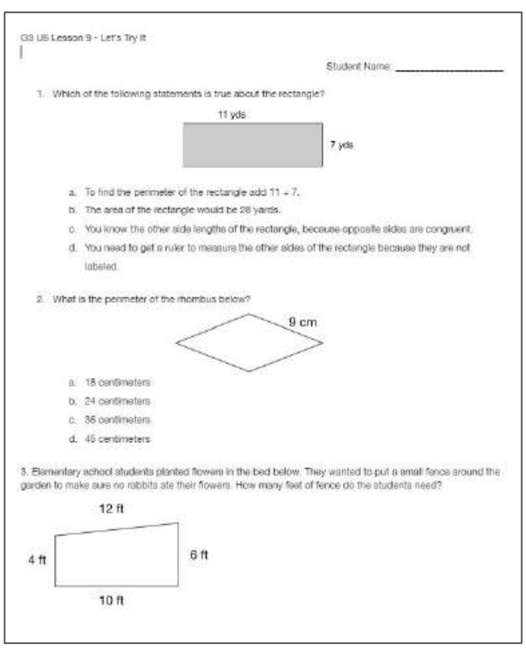
Let's Think:

How might we find the perimeter?



Let's Try It:

Let's apply our understanding together.



G3 U5 Lesson 9 - Let's Try It

Student Name: ________________

1. Which of the following statements is true about the rectangle?

11 yds

7 yds

a. To find the perimeter of the rectangle add 11 + 7.
b. The area of the rectangle would be 28 yards.
c. You know the other side lengths of the rectangle, because opposite sides are congruent.
d. You need to get a ruler to measure the other sides of the rectangle because they are not labeled.

2. What is the perimeter of the rhombus below?

9 cm

a. 18 centimeters
b. 24 centimeters
c. 36 centimeters
d. 45 centimeters

3. Elementary school students planted flowers in the bed below. They wanted to put a small fence around the garden to make sure no rabbits ate their flowers. How many feet of fence do the students need?

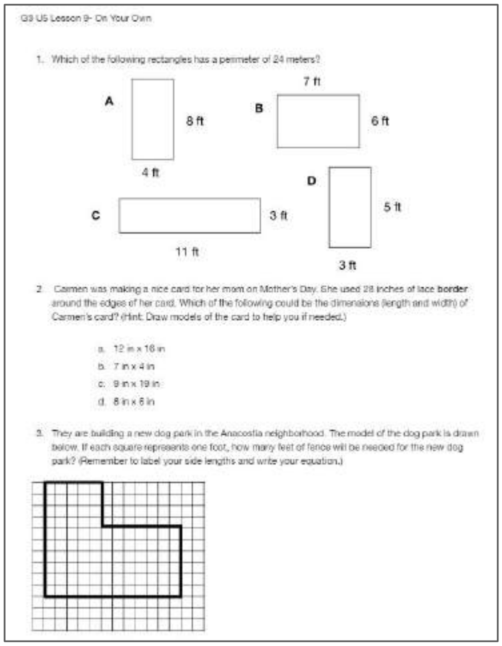
12 ft

4 ft

6 ft

10 ft

On your Own: Let's try on our own.



G3 U5 Lesson 9- On Your Own

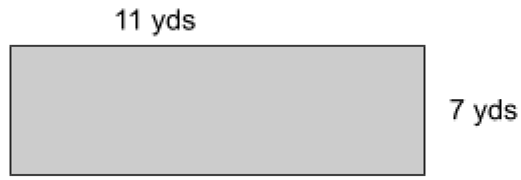
1. Which of the following rectangles has a perimeter of 24 meters?

2. Carmen was making a nice card for her mom on Mother's Day. She used 28 inches of lace **border** around the edges of her card. Which of the following could be the dimensions (length and width) of Carmen's card? (Hint: Draw models of the card to help you if needed.)

   a. 12 in x 16 in
   b. 7 in x 4 in
   c. 9 in x 19 in
   d. 8 in x 6 in

3. They are building a new dog park in the Anacostia neighborhood. The model of the dog park is drawn below. If each square represents one foot, how many feet of fence will be needed for the new dog park? (Remember to label your side lengths and write your equation.)

1. Which of the following statements is true about the rectangle?



   a. To find the perimeter of the rectangle add 11 + 7.
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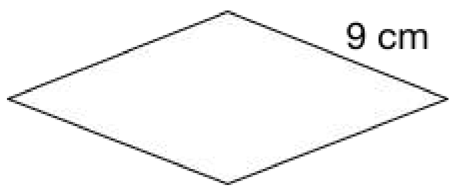
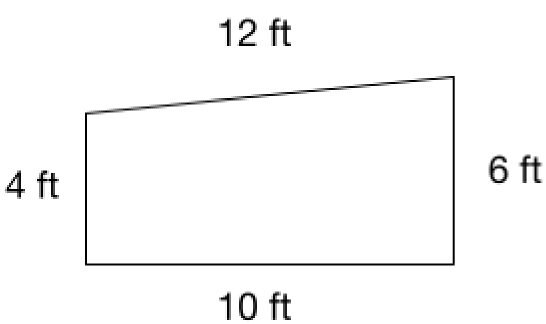


   a. 18 centimeters
   b. 24 centimeters
   c. 36 centimeters
   d. 45 centimeters

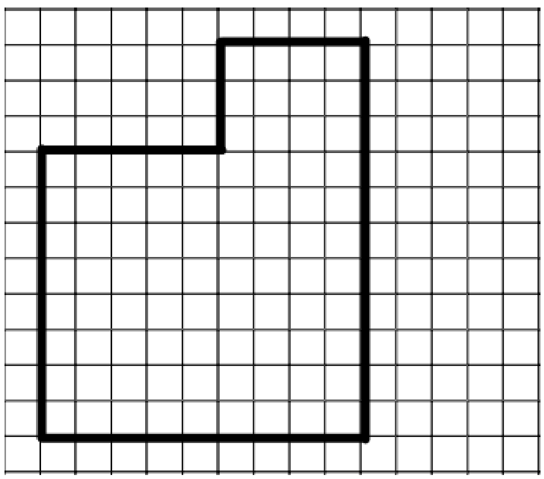
3. Elementary school students planted flowers in the bed below. They wanted to put a small fence around the garden to make sure no rabbits ate their flowers. How many feet of fence do the students need?



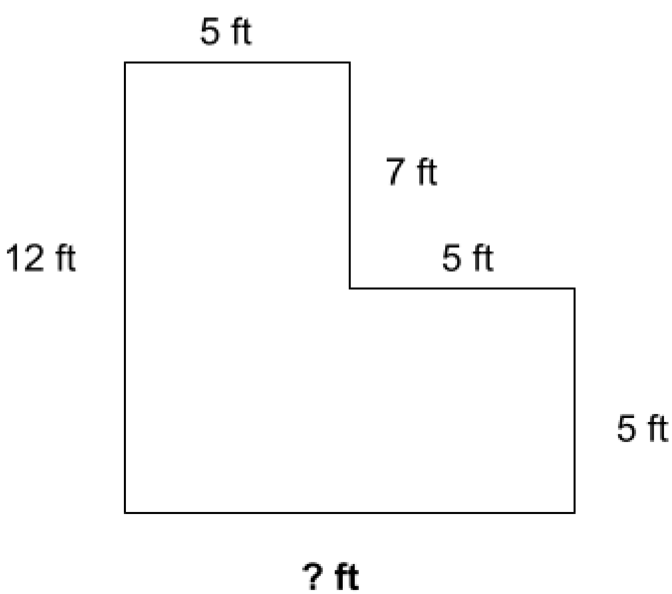
4. Which of the following statements is true?

a. A square with a side length of 5 ft has a perimeter of 20 ft.
b. A rectangle with a length of 6 ft and a width of 4 ft has a perimeter of 24 ft.
c. A rhombus with a side length of 3 ft has a perimeter of 9 ft.
d. A trapezoid with a side length of 9 ft has a perimeter of 36 ft.

5. Below is the outline of a local pool. The city is going to put in new tile around the edges of the pool over the winter. If one square in the grid equals one foot, how many feet of tile does the city need for the edges of the pool?

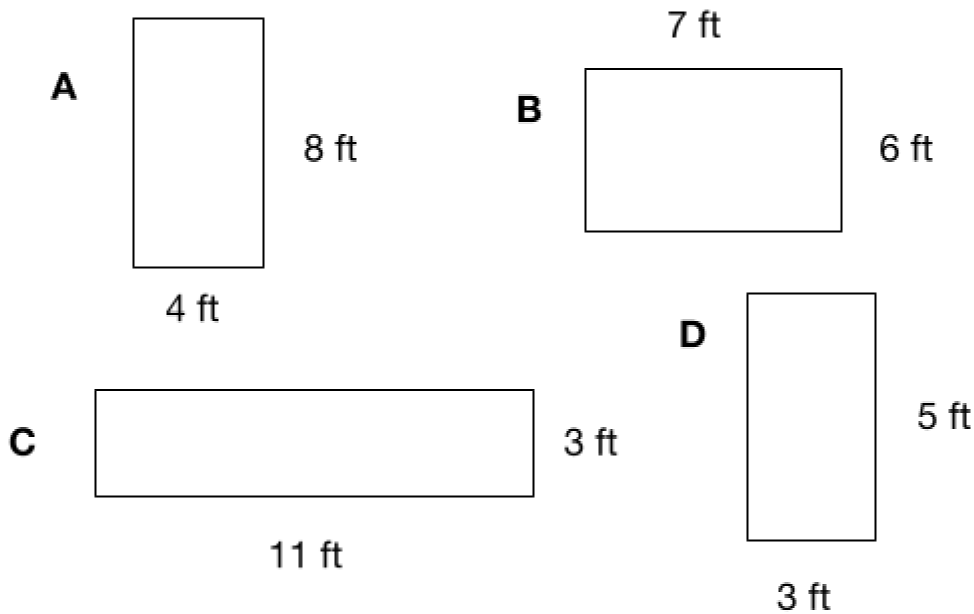


6. Find the perimeter of the shape below. Show your work by marking up your shape and writing your equation. Remember to find the missing side length first!



Name: ____ G3 U5 Lesson 9 - Independent Work

1. Which of the following rectangles has a perimeter of 24 feet?



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    a. 12 in x 16 in
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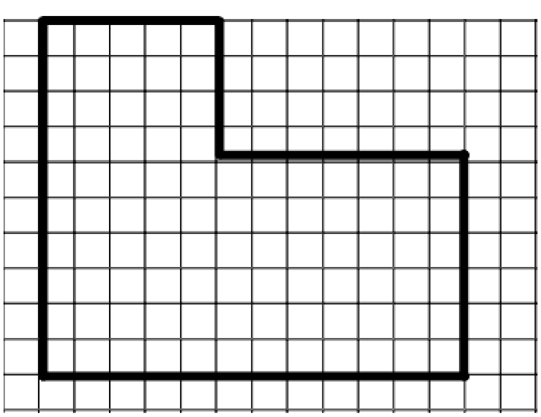
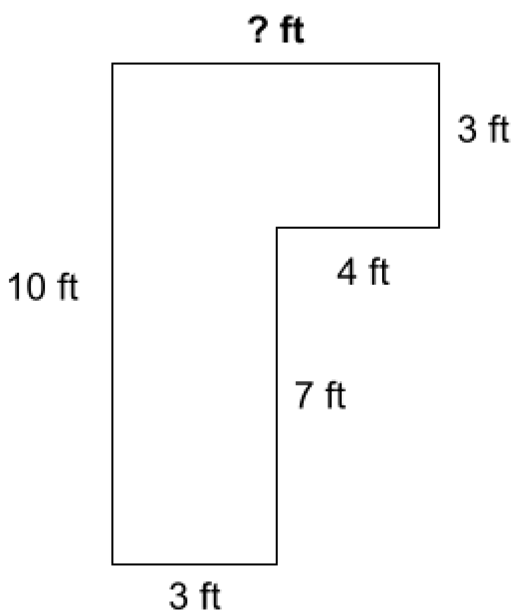
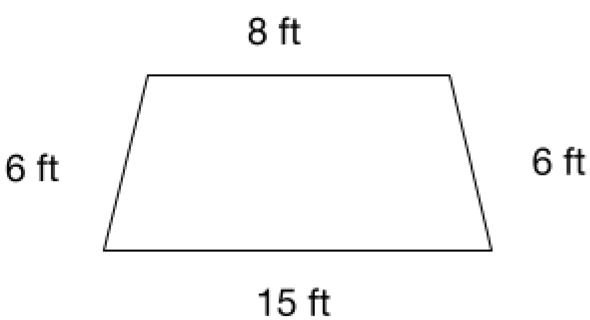


4. Find the perimeter of the shape below. Show your work by marking up the side lengths and writing your equation. Remember to find the missing side length first!

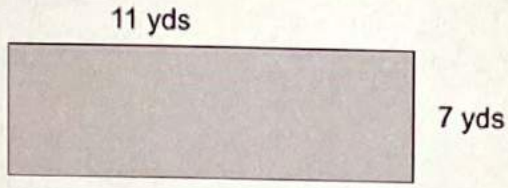


5. The third graders made up a new game to play at recess. Below is a picture of the field they created for the game. They want to paint boundary lines around their field. How many feet of boundary lines do they need to paint?



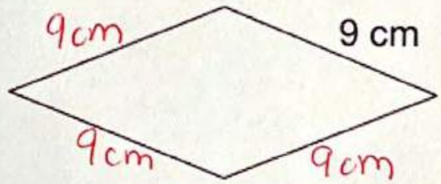
Student Name: Answer Key

1. Which of the following statements is true about the rectangle?



   a. To find the perimeter of the rectangle add 11 + 7.
   b. The area of the rectangle would be 28 yards.
   c. You know the other side lengths of the rectangle, because opposite sides are congruent.
   d. You need to get a ruler to measure the other sides of the rectangle because they are not labeled.

2. What is the perimeter of the rhombus below?

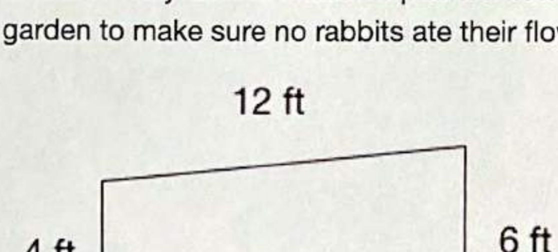


   a. 18 centimeters
   b. 24 centimeters
   c. 36 centimeters
   d. 45 centimeters

$9+9+9+9=$ ___ cm

$4 \times 9 = 36$ cm

3. Elementary school students planted flowers in the bed below. They wanted to put a small fence around the garden to make sure no rabbits ate their flowers. How many feet of fence do the students need?



$12 + 6 + 10 + 4 =$ ___ ft

$18 + 14 = 32$ ft

32 feet of Fence

4. Which of the following statements is true?

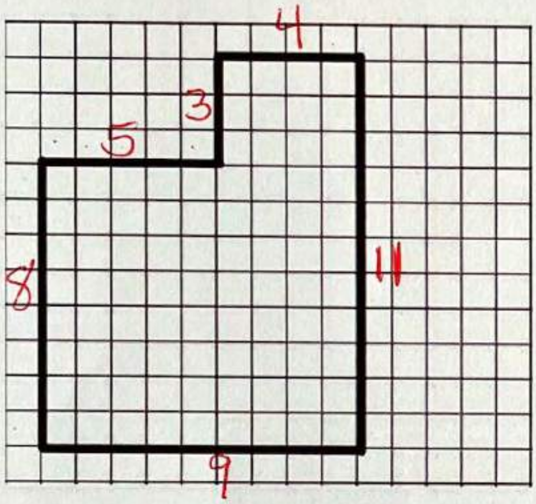
a. A square with a side length of 5 ft has a perimeter of 20 ft.

b. A rectangle with a length of 6 ft and a width of 4 ft has a perimeter of 24 ft. $6+4+6+4=20$ ft

c. A rhombus with a side length of 3 ft has a perimeter of 9 ft. $3+3+3+3=12$ ft

d. A trapezoid with a side length of 9 ft has a perimeter of 36 ft.

5. Below is the outline of a local pool. The city is going to put in new tile around the edges of the pool over the winter. If one square in the grid equals one foot, how many feet of tile does the city need for the edges of the pool?

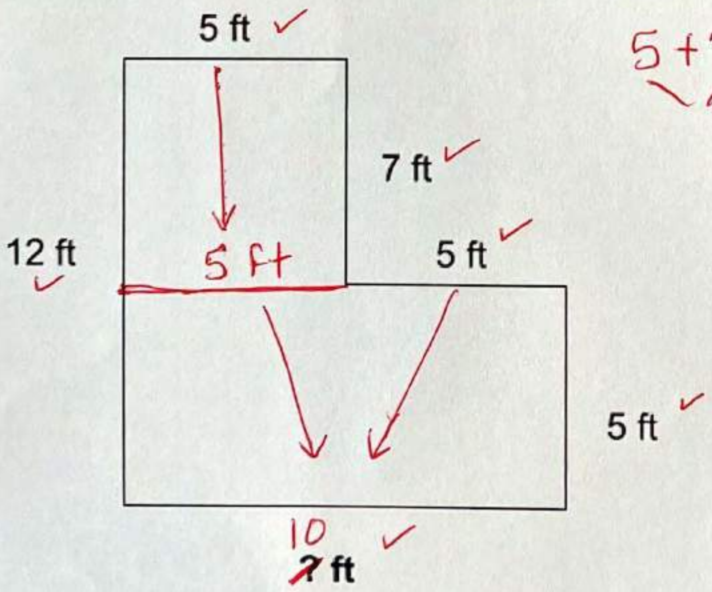


$4+11+9+8+5+3=$ ____ ft

$4+20+16=40$ ft

40 feet of tile

6. Find the perimeter of the shape below. Show your work by marking up your shape and writing your equation. Remember to find the missing side length first!



$5+7+5+5+10+12=$ 44 ft

$12+20+12$

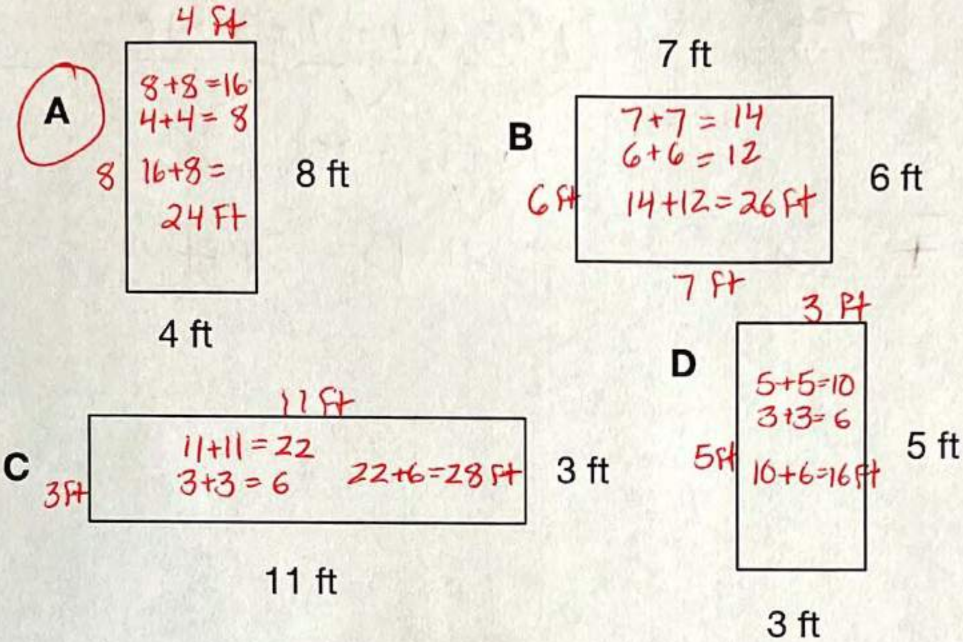
44 ft

P = 44 ft

Student Name: Answer Key

G3 U5 Lesson 9 - Independent Work

1. Which of the following rectangles has a perimeter of 24 feet?



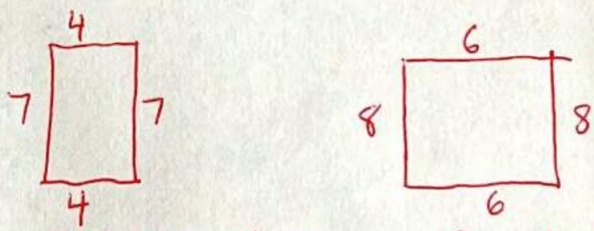
2. Carmen was making a nice card for her mom on Mother's Day. She used 28 inches of lace **border** around the edges of her card. Which of the following could be the dimensions (length and width) of Carmen's card? (Hint: Draw models of the card to help you if needed.)

a. 12 in x 16 in too big

b. 7 in x 4 in

c. 9 in x 19 in too big

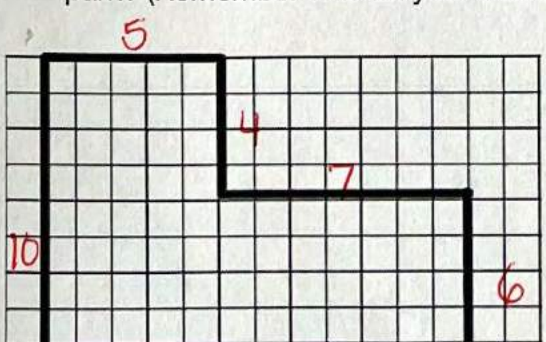
d. 8 in x 6 in



4+4+7+7=8+14=22 in

6+6+8+8=12+16=28 in

3. They are building a new dog park in the Anacostia neighborhood. The model of the dog park is drawn below. If each square represents one foot, how many feet of fence will be needed for the new dog park? (Remember to label your side lengths and write your equation.)



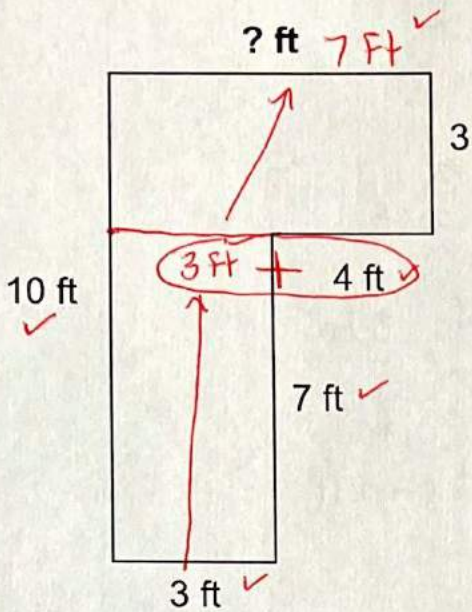
5+4+7+6+12+10= ____

9+13+22= ____

22+22= 44

44 ft of fence

4. Find the perimeter of the shape below. Show your work by marking up the side lengths and writing your equation. Remember to find the missing side length first!

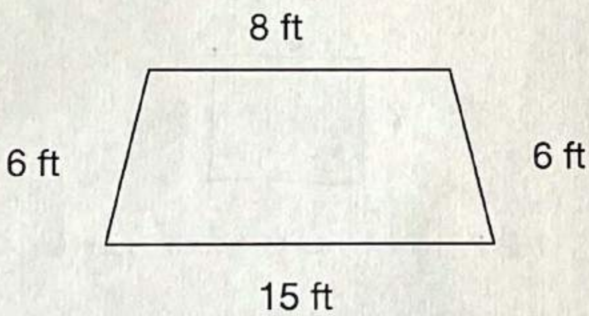


7 + 3 + 4 + 7 + 3 + 10 = ___ Ft

10 + 11 + 13

21 + 13 = 34 Ft

5. The third graders made up a new game to play at recess. Below is a picture of the field they created for the game. They want to paint boundary lines around their field. How many feet of boundary lines do they need to paint?



8 + 6 + 15 + 6 = ___ Ft

14 + 21 = 35 Ft

14
+21

35 Ft of boundary lines

G3 U5 Lesson 10

Calculate area and perimeters

CITYTUTOR DC

G3 U5 Lesson 10 - Students will find area or perimeter of rectangles depending on the context

Tutor Notes: As part of Unit 3, students have already completed an extensive study of area. In third grade, students need to understand how to find area of rectangles and composite shapes that can be decomposed into rectangles. They also must understand the real-world contexts that require both perimeter and area. In most cases, students will be presented with problems that do not include the words perimeter or area, but simply include contexts such as tiling a floor, painting a wall, or building a fence that imply which calculation they need to perform. Students should first reason with the context of the problem and ask themselves if the problem is asking about the area or space being covered by something or if the context of the problem is asking about the distance around something. This reasoning is critical to their success with the overall work of this set of third grade standards.

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): You have worked so hard throughout this unit to deepen your understanding about shapes and their attributes and calculate perimeter. During our last lesson in this unit, we are going to bring back some of the work we did earlier in the year with area to help us determine when we need to solve for the perimeter of rectangles and when we need to solve for the area. Knowing the contexts or real-world examples of when we need to find perimeter and area will help you, not just with this lesson, but when you're older it's going to be very helpful anytime you want to do a project at your house!

Let's Review (Slide 3): Let's get started by reminding ourselves what perimeter and area actually mean. **What are we finding when we calculate perimeter?** Perimeter is the distance around a shape. **And are we solving for when we find area?** Area is the space inside a shape or the amount of space a shape covers.

Great. Now that we have reminded ourselves what area and perimeter actually mean, **how do we calculate them? What equation do we use to find the perimeter of a rectangle?** We have to add all four side lengths together. Nice! So, **what equation do we use to calculate the area of a rectangle?** We multiply length times width.

You remember a lot of the important ideas you learned in the area unit and during our last few lessons together about perimeter. **Let's take a few minutes to brainstorm 2-3 real-life examples of when we need to solve for area or perimeter.** Take a moment to think and let me know when you have an idea.

Let's Review (Slide 4): You brainstormed some great ideas! Here are a few more ideas that are examples of solving for area and perimeter as well. We will be working through contexts like this today in our lesson to help us decide if we are solving for perimeter or area, or both.

Let's Talk (Slide 5): We have a set of real-life examples listed on this slide and we will work together to figure out if it requires us to solve for perimeter or solve for area. *(Read each item aloud to the student.)* **Do you think this situation requires us to solve for the perimeter or solve for the area? Why?** Possible Student Answers, Key Points:

- Painting lines around a field would be perimeter. You need to know the distance around the field for the boundary lines.
- Making a cage would be perimeter. You build a cage to go around something like a pet or a plant. You have to know how much fence or wire you need.
- Hanging a border is perimeter because it goes around a poster or a bulletin board.
- Sewing a tablecloth would be an area because a tablecloth covers a table. You need to know how much fabric you need to cover the whole table.
- Building a fence would be perimeter because a fence goes around a yard or a garden.

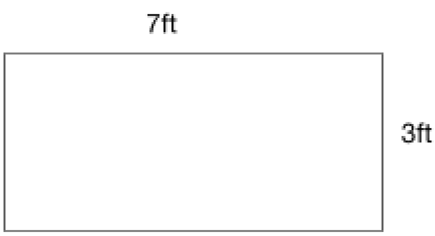
- Painting a wall would be an area because the paint covers the wall.
- Pouring concrete for a sidewalk would be an area because the sidewalk is covering part of the ground.
- Planting plants in a garden would be an area because the plants are taking up space inside the garden. Each plant needs its own amount of space in the garden.

You did a great job reasoning through each of those situations. On the next slide, we are going to find out how we did!

Let's Talk (Slide 6): How did we do with that activity? Are there any answers that were surprising to you that you want to talk about a bit more before we move onto the next part?

Let's Think (Slide 7): Let's read this problem together. We are going to determine which part of the problem requires us to solve for the area and which part of the problem requires us to solve for the perimeter.

Let's read this together, "The Bakers put a new rectangular flower bed in their backyard. The flower bed is 7 feet by 3 feet. Part A says they want to put a fence up around the flower bed so that groundhogs don't eat all of the petals. How many feet of fencing do the Bakers need? Part B: Then, the Bakers went to the garden shop to get some seeds to plant in their flower bed. If each of the flowers they want to plant takes up one square foot, how many seeds should they purchase at the garden shop?"



Hmm, I think it might be helpful for us to start by drawing a model of the flower bed. What should I draw for the model? What should I label? You should draw a rectangle. The long side (length) should be 6 ft and the side (width) should be 3 ft.

Let's look at Part A, this is making me think we need to solve for perimeter. A fence goes around a garden, so they need to know the distance around the garden to know how much fence to buy.

Let's solve that problem for the Bakers. How many feet of fencing do they need for their garden? (*Encourage students to try on their own)* The Bakers will need 20 feet of fencing.

So, Part A was asking us about perimeter, the distance around the outside of the garden. Let's look at Part B. **What clues did you notice about the situation in Part B?** Possible Student Answers, Key Points:

- Part B is asking about planting seeds in the garden. I know that the seeds will take up space inside the garden, so I think it is area.
- There is also a context clue about each seed needing one square foot in the garden, and I know we get square feet when we multiply feet x feet.

Great thinking! Now, before we start solving Part B, remember the question is asking us how many seeds the Bakers should buy. That clue about one seed needing one square foot in the garden is a big hint for us! **What do you think we need to do to solve Part B?** We have to find the area of the garden.

You are absolutely right. So let's find the area and how many seeds the Bakers will need, everybody work on your whiteboards or paper. So, what's the area of the Baker's garden? 21 square feet! But the question asks us how many seeds they should buy…21 seeds!

Let's Try it (Slides 10): You've done a lot of thinking and reasoning today so far about how we know when to solve for area and when to solve for perimeter. As we practice together, let's remember to always ask ourselves what the situation in the problem is telling us; is it telling us we need to cover something or is it telling us to put something around something else? We have to think first, and then solve! If the problem doesn't give us a model, then we should draw one to help ourselves.

WARM WELCOME

Today we will find both the area and perimeter of rectangles depending on the context.

Let's Review:

	Perimeter	Area
Definition		
Equation (for rectangles)		
Examples		

Let's Review:

	Perimeter	Area
Definition	The distance around the outside of a shape.	The space inside a shape, or what it covers
Equation (for rectangles)	Add all the side lengths ___ + ___ + ____ + ____	Multiply the sides ____ x ____
Examples	• Building a fence • Putting a border on something • Boundary lines of a sports field	• Tiling a floor • Painting a wall • Hanging a poster

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Let's Talk:

Perimeter or Area?

Painting lines around a field

Making a cage

Hanging a border

Building a fence

Sewing a tablecloth

Painting a wall

Pouring concrete for a sidewalk

Planting plants in a garden

Area	Perimeter

Let's Talk:

Perimeter or Area?

Painting lines around a field

Making a cage

Hanging a border

Building a fence

Sewing a tablecloth

Painting a wall

Pouring concrete for a sidewalk

Planting plants in a garden

Area	Perimeter
Sewing a tablecloth	Painting lines around a field
Painting a wall	Making a cage
Pouring concrete for a sidewalk	Building a fence
Planting plants in a garden	Hanging a border

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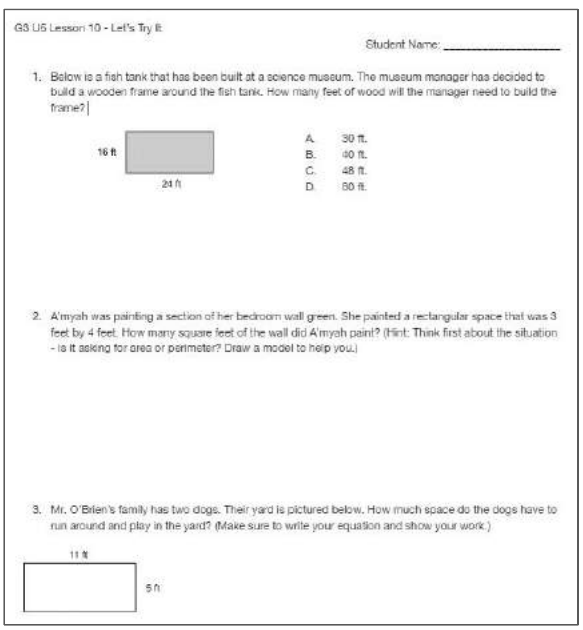
Let's Think:

Perimeter or Area? How do you know?

v

Let's Try It:

Let's apply our understanding together.


G3 U5 Lesson 10 - Let's Try It

Student Name: ___________________

1. Below is a fish tank that has been built at a science museum. The museum manager has decided to build a wooden frame around the fish tank. How many feet of wood will the manager need to build the frame?

A. 30 ft.
B. 40 ft.
C. 48 ft.
D. 80 ft.

2. A'myah was painting a section of her bedroom wall green. She painted a rectangular space that was 3 feet by 4 feet. How many square feet of the wall did A'myah paint? (Hint: Think first about the situation - is it asking for area or perimeter? Draw a model to help you.)

3. Mr. O'Brien's family has two dogs. Their yard is pictured below. How much space do the dogs have to run around and play in the yard? (Make sure to write your equation and show your work.)

On your Own: Let's try on our own.

G3 U5 Lesson 10 - On Your Own

Student Name: ____________________

1. Which of the following situations would require you to find a perimeter? Select all that apply.

   a. Hanging lights around each corner of a room
   b. Designing the front cover of a new comic book
   c. Making a chalk outline of a hopscotch board
   d. Creating a poster to run for class president
   e. Building a frame for a piece of art

2. Ms. Walls bought a new carpet for her classroom. Her carpet is shown below. How much of her classroom floor will be covered by the carpet? Show your work to prove your answer.

6 ft

6 ft

   A. 12 square feet
   B. 24 square feet
   C. 36 square feet
   D. 60 square feet

3. Some construction workers replaced 48 square feet of **flooring** in the cafeteria's kitchen. Which of the dimensions below could represent the section of floor that was replaced? Draw a model and show your work to support your answer.

   a. 12 ft x 12 ft
   b. 40 ft x 8 ft
   c. 8 ft x 6 ft
   d. 9 ft x 7 ft

Name: ____ G3 U5 Lesson 10 - Let's Try It

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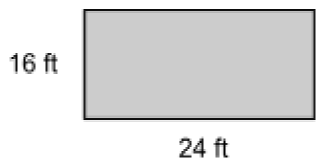

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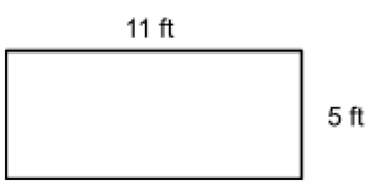
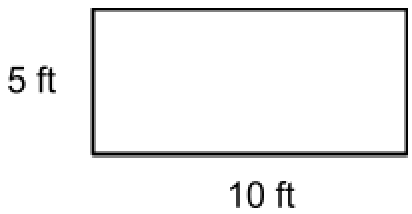
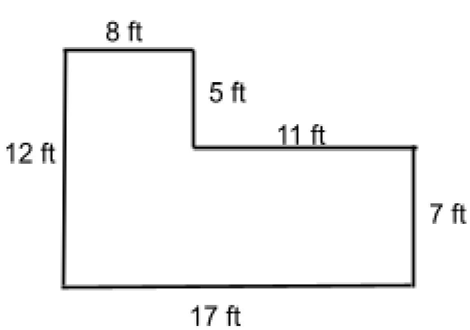


4. Queen was knitting a blanket, pictured below. She wants to put a lace border on the blanket. How many feet of border will Queen need to buy for the blanket?



5. There are two gardens behind our school. One garden is 8 feet by 4 feet and the other is 7 feet by 5 feet. Which garden would require more fencing? (Hint: Draw a model of both gardens. Do you need to find the area of each or the perimeter of each?)

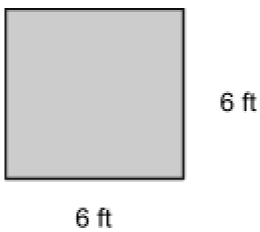
6. A new stage is being built at an outdoor theater. The construction company is putting up a railing around the stage to keep the crowd back. How many feet of railing will the construction company need? (Write your equation and show your work.)



1. Which of the following situations would require you to find a perimeter? Select all that apply.

a. Hanging lights around each corner of a room
b. Designing the front cover of a new comic book
c. Making a chalk outline of a hopscotch board
d. Creating a poster to run for class president
e. Building a frame for a piece of art

2. Ms. Walls bought a new carpet for her classroom. Her carpet is shown below. How much of her classroom floor will be covered by the carpet? Show your work to prove your answer.



A. 12 square feet
B. 24 square feet
C. 36 square feet
D. 60 square feet

3. Some construction workers replaced 48 square feet of **flooring** in the cafeteria's kitchen. Which of the dimensions below could represent the section of floor that was replaced? Draw a model and show your work to support your answer.

a. 12 ft x 12 ft
b. 40 ft x 8 ft
c. 8 ft x 6 ft
d. 9 ft x 7 ft

4. The YMCA just built a new playground area for their after-school students. Their playground is 8 feet by 7 feet.

Part A: How many square feet of space will they need to cover with mulch?

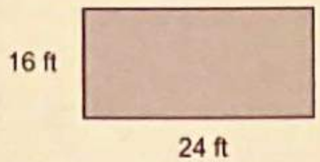
Part B: The employees at the YMCA also want to put a tall fence up around the playground to help keep the children safe. How many feet of fence do they need for the fence?

5. The Thompsons and the Whites both just got new puppies. The Thompsons built a pen in their backyard that is six feet by four feet for their puppy. The Whites also built a pen for their puppy but theirs is seven feet by five feet. Which family needed more feet of material to build their pen? Draw a model for each and write equations to prove your answer.

The ______________________ family needed more material to build the pen for their new puppy.

Student Name: Answer Key

1. Below is a fish tank that has been built at a science museum. The museum manager has decided to build a wooden frame around the fish tank. How many feet of wood will the manager need to build the frame?



A. 30 ft.
B. 40 ft.
C. 48 ft.
D. 80 ft.

$16 + 24 + 16 + 24 = \_\_\_\_$

$$\begin{array}{r} 16 \\ +24 \\ \hline 40 \end{array} \qquad \begin{array}{r} 40 \\ +40 \\ \hline 80 \end{array}$$

2. A'myah was painting a section of her bedroom wall green. She painted a rectangular space that was 3 feet by 4 feet. How many square feet of the wall did A'myah paint? (Hint: Think first about the situation - is it asking for area or perimeter? Draw a model to help you.)

3 ft PAINT 4 ft

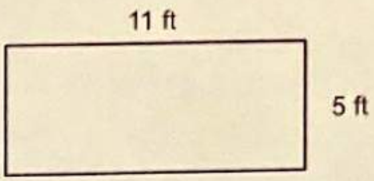
$3 \times 4 = 12$

12 square feet

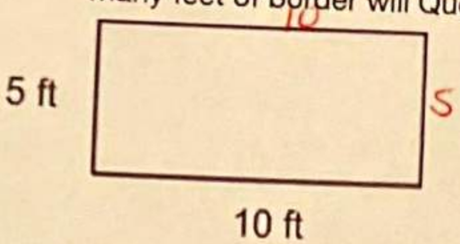
3. Mr. O'Brien's family has two dogs. Their yard is pictured below. How much space do the dogs have to run around and play in the yard? (Make sure to write your equation and show your work.)

$A = L \times W$

$11 \times 5 = 55$ square feet

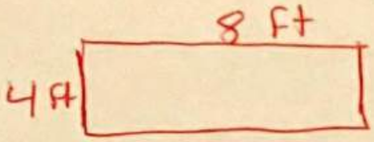


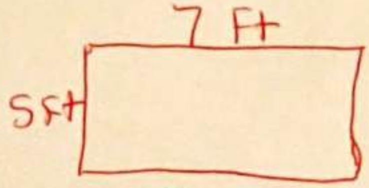
4. Queen was knitting a blanket, pictured below. She wants to put a lace border on the blanket. How many feet of border will Queen need to buy for the blanket?



$10+5+10+5 = 30$ feet
30 feet of border

5. There are two gardens behind our school. One garden is 8 feet by 4 feet and the other is 7 feet by 5 feet. Which garden would require more fencing? (Hint: Draw a model of both gardens. Do you need to find the area of each or the perimeter of each?)





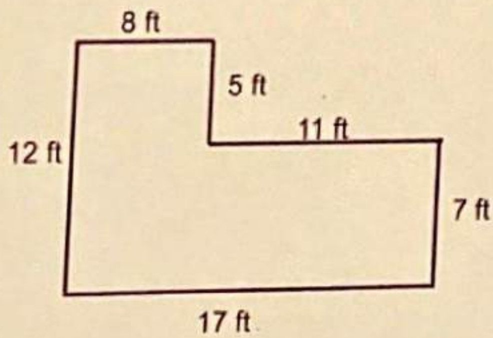
$8+4+8+4 =$ ____
$12+12=24$
24 feet

$7+5+7+5=$ ____
$12+12=24$
24 feet

They will need the same amount of fencing

The garden that is ______ feet by ______ feet will require more fencing.

6. A new stage is being built at an outdoor theater. The construction company is putting up a railing around the stage to keep the crowd back. How many feet of railing will the construction company need? (Write your equation and show your work.)



$8+5+11+7+17+12=$ ____ ft
$13+18+29$

$$\begin{array}{r} {}^{2}13 \\ 18 \\ +\ 29 \\ \hline 60 \end{array}$$

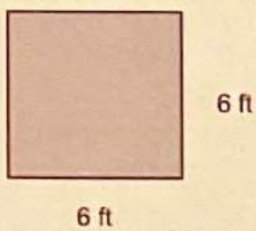
60 feet of railing

Student Name: Answer Key G3 U5 Lesson 10 - Independent Work

1. Which of the following situations would require you to find a perimeter? Select all that apply.

a. Hanging lights around each corner of a room
b. Designing the front cover of a new comic book
c. Making a chalk outline of a hopscotch board
d. Creating a poster to run for class president
e. Building a frame for a piece of art

2. Ms. Walls bought a new carpet for her classroom. Her carpet is shown below. How much of her classroom floor will be covered by the carpet? Show your work to prove your answer.



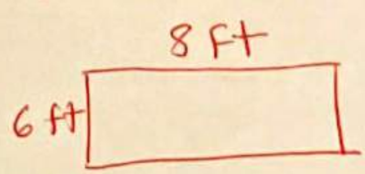
$A = L \times W$
$A = 6\text{ ft} \times 6\text{ ft}$
$A = 36\text{ ft}^2$

A. 12 square feet
B. 24 square feet
C. 36 square feet
D. 60 square feet

3. Some construction workers replaced 48 square feet of **flooring** in the cafeteria's kitchen. Which of the dimensions below could represent the section of floor that was replaced? Draw a model and show your work to support your answer.

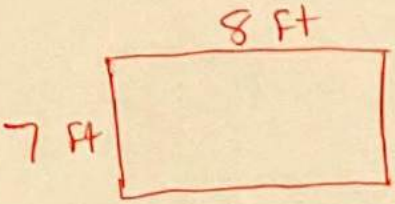
a. 12 ft x 12 ft
b. 40 ft x 8 ft
c. 8 ft x 6 ft
d. 9 ft x 7 ft

$L \times W = 48$ sq ft.
$8 \times 6 = 48$



4. The YMCA just built a new playground area for their after-school students. Their playground is 8 feet by 7 feet.

Part A: How many square feet of space will they need to cover with mulch?

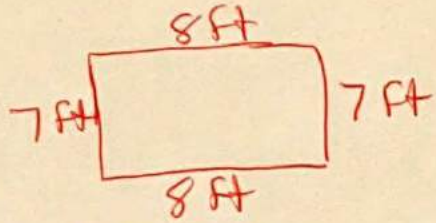


$A = L \times W$

$A = 8 \times 7$

$A = 56 \text{ ft}^2$

Part B: The employees at the YMCA also want to put a tall fence up around the playground to help keep the children safe. How many feet of fence do they need for the fence?

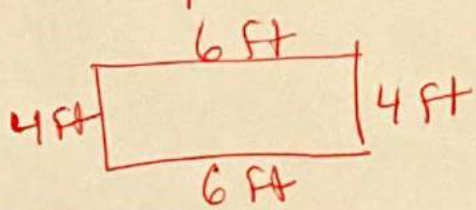


$\underbrace{8+7}_{15}+\underbrace{8+7}_{15} =$ 30 feet

$15 + 15 = 30$

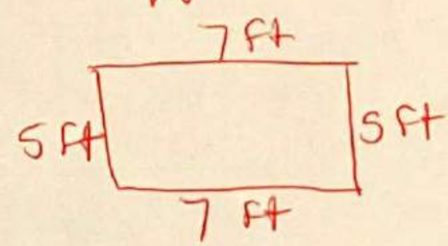
5. The Thompsons and the Whites both just got new puppies. The Thompsons built a pen in their backyard that is six feet by four feet for their puppy. The Whites also built a pen for their puppy but theirs is seven feet by five feet. Which family needed more feet of material to build their pen? Draw a model for each and write equations to prove your answer.

T



$6+4+6+4 = 20$ ft

W



$\underbrace{7+5}_{12}+\underbrace{7+5}_{12} = 24$ ft

The White **family needed more material to build the pen for their new puppy.**

CITYTUTOR DC

G3 Unit 6:

Telling Time

G3 U6 Lesson 1

Tell time to the nearest hour and half hour

CITYTUTOR DC

G3 U6 Lesson 1 - Students will tell time to the nearest hour and half hour

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): Today we're going to jump into something you already know a lot about, time.

Let's Talk (Slide 3): You began learning to tell time in first and second grade. Let's start by touching back on everything we already know about time. **So, what do you know about telling time?** Possible Student Answers, Key Points:

- Time moves forward
- There are 2 kinds of clocks.
- There are hours and minutes and seconds.
- Hours are longer than minutes, minutes are longer than seconds.
- There are 60 minutes.
- It's how you know when to do things/when things start and end.
- There are clocks everywhere: microwave, hanging on the wall, phones, watches, TVs, computers/laptops.

Wow, you all really do know a lot about time! You're exactly right that there are clocks all over, in fact I bet we can spot one somewhere in this room now. So today, we're going to use everything we know about clocks to tell time to the nearest hour and nearest half hour…you might already know how to do this but it's going to help us do some more challenging time work in the next few lessons.

Let's Think (Slide 4): We use clocks to tell time and just like you told me, there are clocks ALL over the place. There are two kinds of clocks. There are analog clocks like the one on the right (*point*). You've probably seen one of those hanging in your classroom. And here are digital clocks like the one on the left (*point*). You've probably seen those on microwaves, stoves, phones, digital watches, TVs and laptops/computers.

Clocks measure time using hours and minutes. There are 60 minutes in an hour. We can see how many minutes have passed on the right side of the digital clock *(point)*, or with the long hand on the analog clock *(point)*. On an analog clock, each of these *(point)* tick marks is 1 minute. The long hand points to the amount of minutes that have passed in an hour.

There are 12 hours on a clock. We can see how many hours have passed on the left side of the digital clock *(point)*, or with the short hand on the analog clock *(point).* The short hand points to the number of hours that have passed in a day.

Both of the clocks on this slide show the exact same time. Whenever the minutes say 00 on a digital clock, or the minute hand points to 12 on an analog clock–remember the 12 is 0 minutes–it's a special kind of time. Do you know what it means? O' Clock!

That's right, whenever zero minutes have passed, or the minute hand is on the 12 (*point*), we can say o'clock. That means that it's a brand new hour and NO minutes have passed in that hour. When you look at the digital clock, we know that it's a new hour where NO minutes have passed because it shows :00 on the minutes side.

So when I read this digital clock, the hour is 1 and I see :00 as the minutes, that means that it's 1 o'clock. It's a brand new hour and no minutes have passed in that hour. Now, let's look at the analog clock. We see that the hour hand, the shorter one, is pointing to the 1 and the minute hand is perfectly at the 12, that means that it's 1 o'clock. Both of these clocks are showing 1 o'clock.

So, when zero minutes have passed the hour, we call the time o'clock. We say the hour and the minutes are always o'clock.

Let's Talk (Slide 5): Okay so we just talked about how to tell time to the nearest hour…1 o'clock, 2 o'clock, and so on. But now we're going to think about minutes passing in each hour because we know that there are times between each hour. For example, there are times between 1:00 and 2:00.

So, let's look carefully at this slide. Clock A shows 2 o'clock because the hour hand is pointing directly to the 2 and the minute hand is pointing directly to the 12. But the clock next to it, Clock B, looks different. The hour hand has passed the 2, but it hasn't gotten to the 3 yet–it's perfectly halfways between the 2 and the 3. And that makes sense because the minute hand isn't on the 12 anymore, look it's all the way down at the 6 (*point)*. I'm going to see how many minutes have actually passed.

I know that each of these tiny tick marks is 1 minute, so I could count by 1s. But I can also count by 5s. There are 5 minutes between each hour mark see: 1, 2, 3, 4, 5. So, I can skip the hour marks by 5s and count the minutes much faster.

Help me skip count by 5s starting at the 12 which is 0 minutes. We'll count all the way to the 6 so see how many minutes have passed. Ready…0, 5, 10, 15, 20, 25, 30 *(draw and label hops as you count)*. S0, 30 minutes have passed the hour!

The hour is still 2, but the hour hand isn't on the 2 anymore because 30 minutes have gone by. As minutes go by, the hour hand slowly moves closer and closer to the next hour. But, the hour doesn't change until the minute hand gets back up to the 12.

So, Clock A shows two o'clock and Clock B shows 2:30, 30 minutes have passed since 2:00. And look, when the minute hand gets to the 6, HALF of the clock is covered, or half of an hour has passed. Sometimes people call the time 1:30 or 2:30 or 8:30 when the minute hand gets to the 30. But sometimes instead they say, "half past 2" for 2:30 or "half past 8" for 8:30. It's half past two, because half the minutes have passed after the 2 o'clock hour.

Let's Think (Slide 7): Let's look at two clocks and write the time as digital.

Look at the green clock. We always read the hour hand first, so find the hour hand, is it red or blue? Red! That's right, the hour hand is red because it's the SHORTER hand. And it's pointing directly at the…8!

Next, let's check the minute hand. The minute hand is the longer hand. Where is the minute hand pointing? To the 12! That's right, so that means it's what time? 8 o'clock! And, how do we write 8 o'clock? 8:00! That's right, we use 00 to show that no minutes have passed in the hour!

8 o'clock

I know the special name for when 0 minutes have passed is o'clock. So the time is 8 o'clock, I'm going to write the special name.

Let’s try the yellow clock. Where do we start? With the hour hand! We see the short hand/hour hand isn’t on a number. It has passed the 9, but it hasn’t gotten to the 10 yet. So, the hour is still 9. Let’s write the hour.

Now we have to look at the minute hand. It’s not at 12 so we have to skip count to figure out how many minutes have past. Count with me starting at 0… 0, 5, 10, 15, 20, 25, 30. So, 30 minutes have passed. The time is 9:30. I can always skip count, but it’s good to remember the 6 is always 30 minutes..

Half Past 9

Finally, I’m going to write the special name for 9:30. Half the minutes have passed the hour 9. It is half past 9.

Let’s Try It (Slide 8-9): Let’s try some problems together. Remember we always start with the hour, then we move to the minutes.

WARM WELCOME

Today we will tell time to the nearest hour and half hour.

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Let's Talk:

What do you know about telling time?

Let's Think:

We can tell time on two types of clocks.

Where do we find the **hour** on each clock?

Where do we find the **minutes** on each clock?

Let's Think:

A

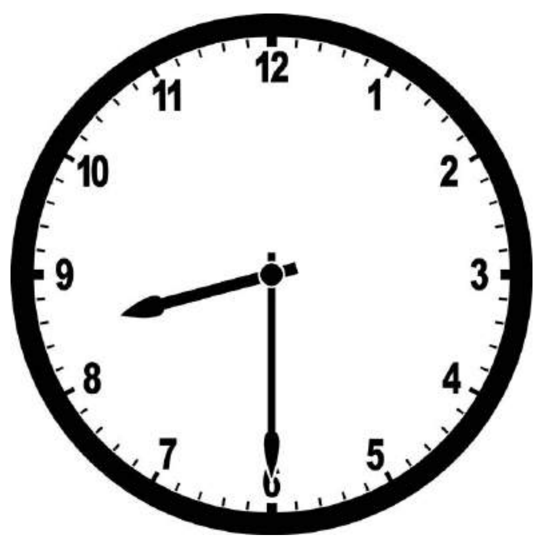
B

What happens to the hour hand as more minutes pass? Why?

How many minutes have passed when the minute hand gets to the 6?

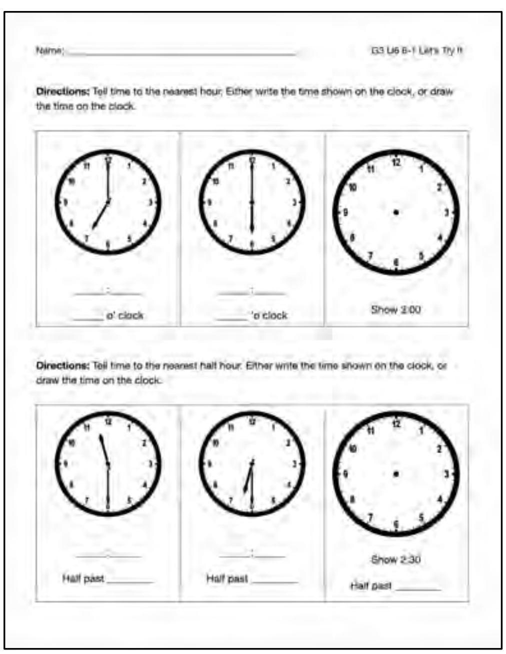
Let's Talk:

How much of the clock has the minute hand covered once it gets to the 6?



Let's Think: What time is it on each clock?

Let's Try It: Let's apply our understanding together.



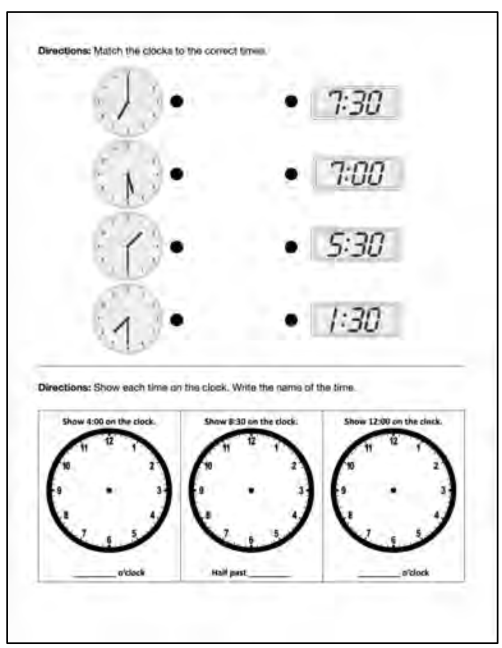
Name: ______________________ G3 U6 6-1 Let's Try It

Directions: Tell time to the nearest hour. Either write the time shown on the clock, or draw the time on the clock.

___:___ ___ o' clock	___:___ ___ 'o clock	Show 2:00

Directions: Tell time to the nearest half hour. Either write the time shown on the clock, or draw the time on the clock.

___:___ Half past ______	___:___ Half past ______	Show 2:30 Half past ______



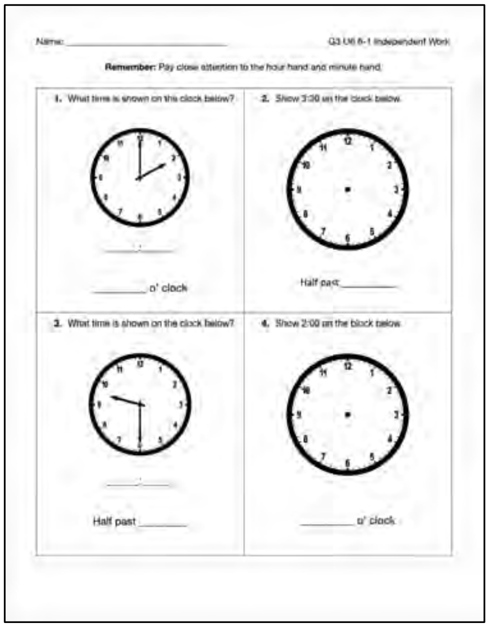
Directions: Match the clocks to the correct times.

7:30
7:00
5:30
1:30

Directions: Show each time on the clock. Write the name of the time.

Show 4:00 on the clock.	Show 8:30 on the clock.	Show 12:00 on the clock.
______ o'clock	Half past ______	______ o'clock

On your Own: Now it's time to try on your own.


Name: ____________________ Q3 U6 8-1 Independent Work

Remember: Pay close attention to the hour hand and minute hand.

1. What time is shown on this clock below?

   ___:___

   ________ o' clock

2. Show 3:30 on the clock below.

   Half past ________

3. What time is shown on the clock below?

   ___:___

   Half past ________

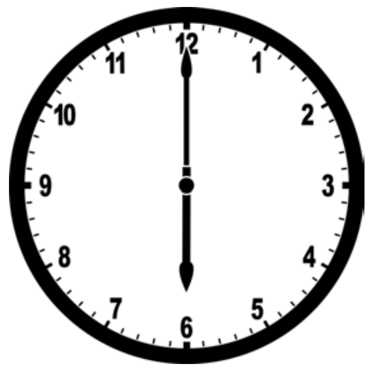
4. Show 2:00 on the block below.

   ________ o' clock

Directions: Tell time to the nearest hour. Either write the time shown on the clock, or draw the time on the clock.

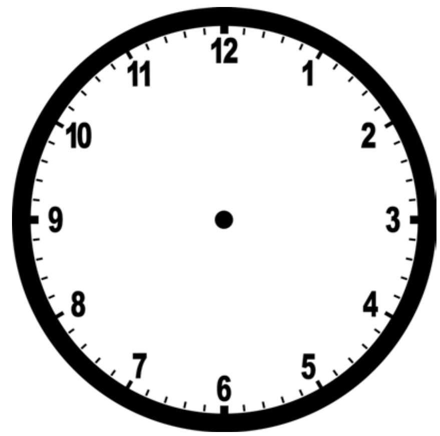
_____:_____

_____ o’ clock



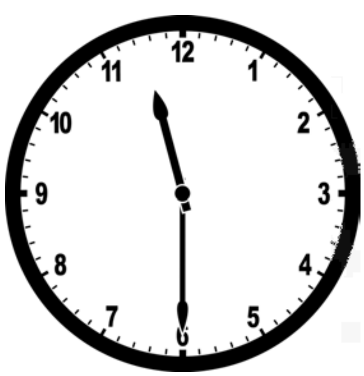
_____:_____

_____ ‘o clock



Show 3:00

Directions: Tell time to the nearest half hour. Either write the time shown on the clock, or draw the time on the clock.

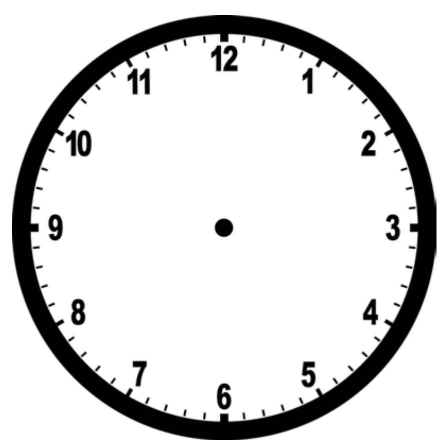


_____:_____

Half past ________

_____:_____

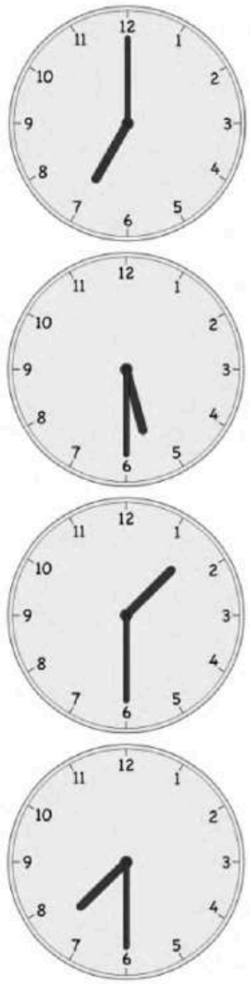
Half past ________



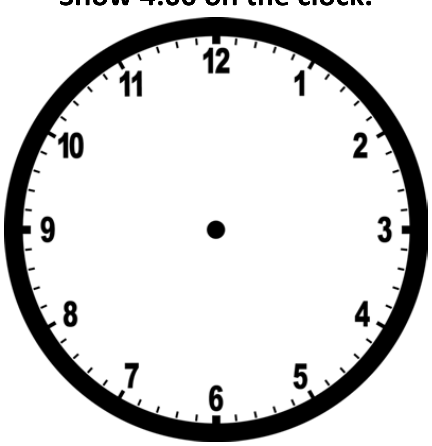
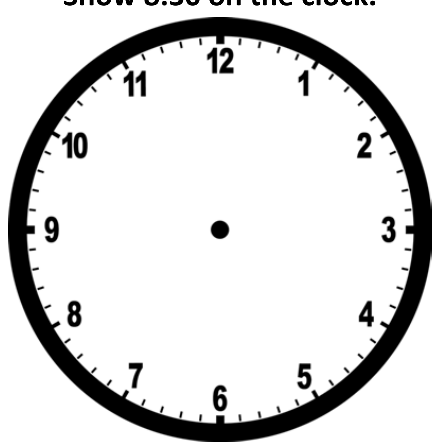
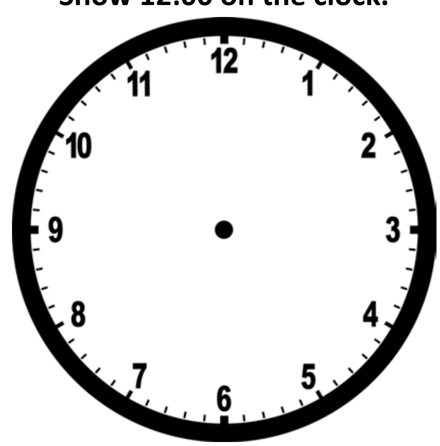
Show 2:30

Half past ________

Directions: Match the clocks to the correct times.



Directions: Show each time on the clock. Write the name of the time.

Show 4:00 on the clock.	Show 8:30 on the clock.	Show 12:00 on the clock.
		
__________ o'clock	half past __________	__________ o'clock

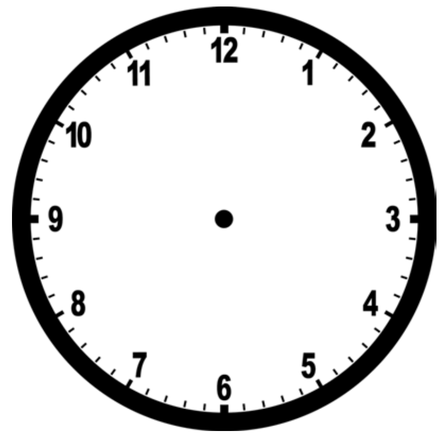
Remember: Pay close attention to the hour hand and minute hand.

1. What time is shown on the clock below?

______:______

_________ o' clock

2. Show 3:30 on the clock below.



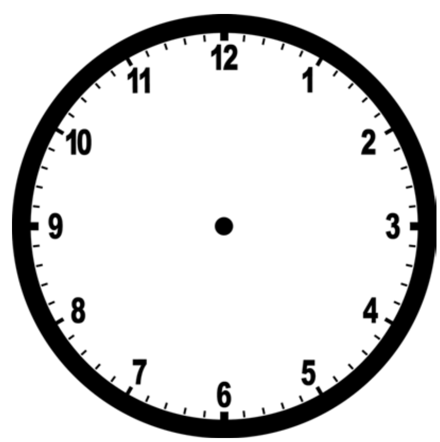
Half past __________

3. What time is shown on the clock below?

______:______

Half past _________

4. Show 2:00 on the block below.

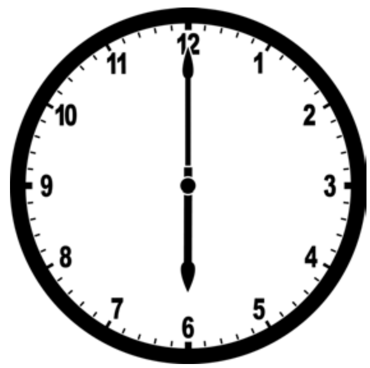


_________ o' clock

Directions: Tell time to the nearest hour. Either write the time shown on the clock, or draw the time on the clock.

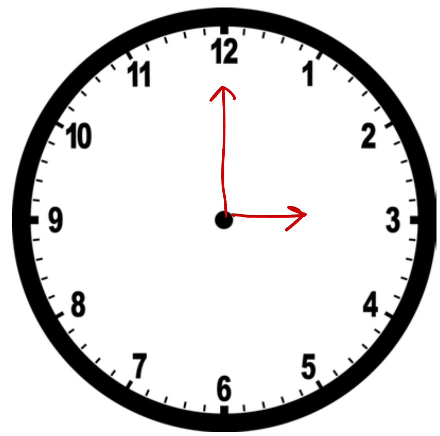
7 : 00

7 o' clock



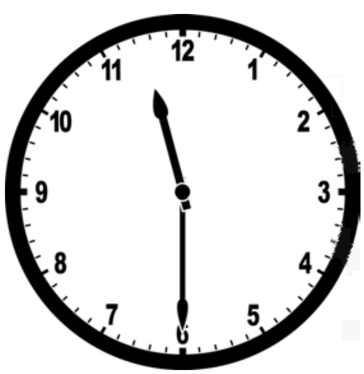
6 : 00

6 'o clock



Show 3:00

Directions: Tell time to the nearest half hour. Either write the time shown on the clock, or draw the time on the clock.

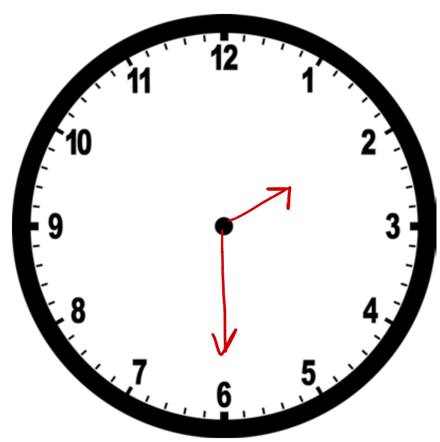


11 : 30

Half past 11

6 : 30

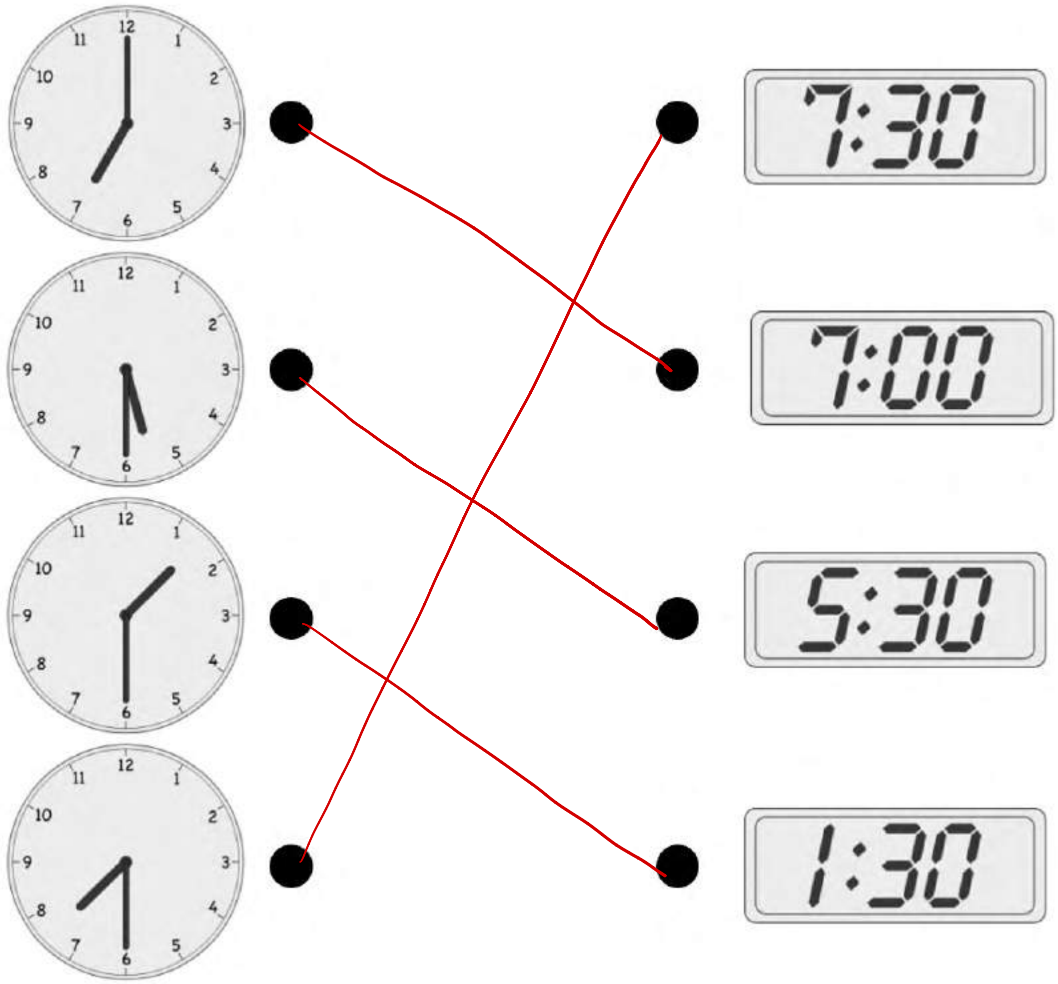
Half past 6



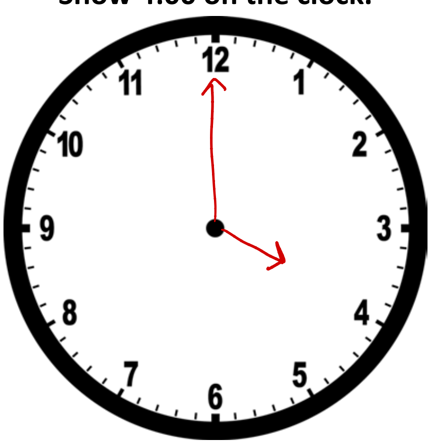
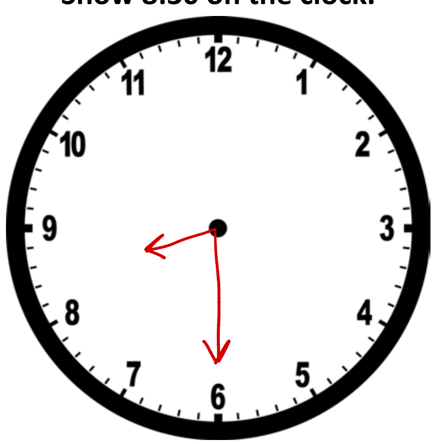
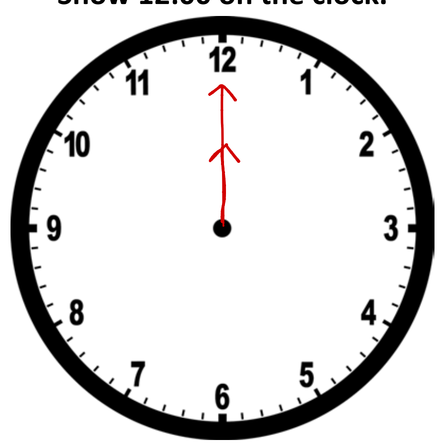
Show 2:30

Half past 2

Directions: Match the clocks to the correct times.



Directions: Show each time on the clock. Write the name of the time.

Show 4:00 on the clock.	Show 8:30 on the clock.	Show 12:00 on the clock.
		
4 o'clock	Half past 8	12 o'clock

Name: ______________________________ G3 U6 Lesson 1 - Independent Work

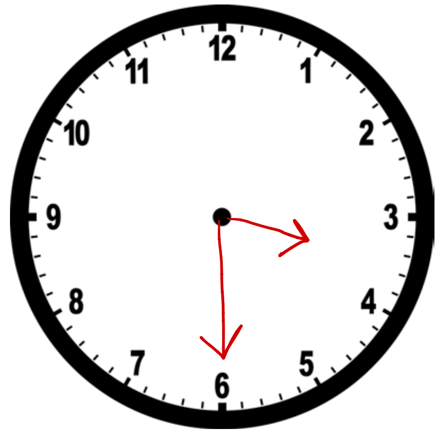
Remember: Pay close attention to the hour hand and minute hand.

1. What time is shown on the clock below?

2 : 00

2 o' clock

2. Show 3:30 on the clock below.



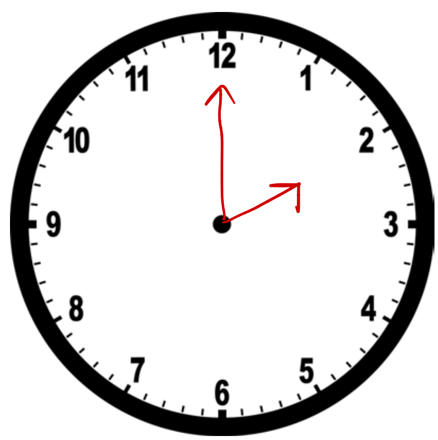
Half past 3

3. What time is shown on the clock below?

9 : 30

Half past 9

4. Show 2:00 on the block below.



2 o' clock

G3 U6 Lesson 2

Tell time to the nearest minute

CITYTUTOR DC

G3 U6 Lesson 2 - Students will tell time to the nearest minute

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): Today we will continue telling time. Yesterday we told time to the nearest hour and half hour. Today we will be even more precise and tell time to the nearest minute.

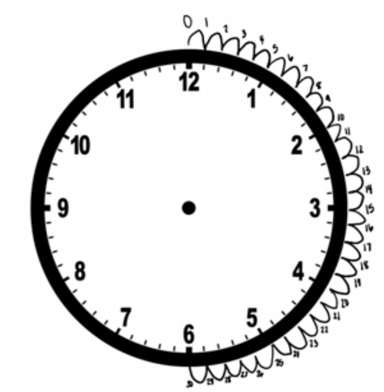
Let's Review (Slide 3): Let's quickly review some of what we learned yesterday. There are two clocks on this slide. One says 1 o'clock. The other says 1:30 or half past 1. **How do we know the hour in each time?**
Possible Student Answers/Key Points:

- We look at the short hand.
- The short hand tells us the hour.
- The short hand points to the 1.
- Once the short hand points to the 1, the hour is still one even once it passes the one. It's only the next hour when it points to the two.

Correct, we measure time that has passed. The hour hand lets us know the hour by pointing to the hour. As it passes the hour, we know it's getting closer to the next hour. And to know how many minutes have passed, we look at the long hand. We can either count by ones or skip count to find how many minutes have passed in an hour. Today we'll be paying close attention to the minute hand as we tell time to the nearest minute.

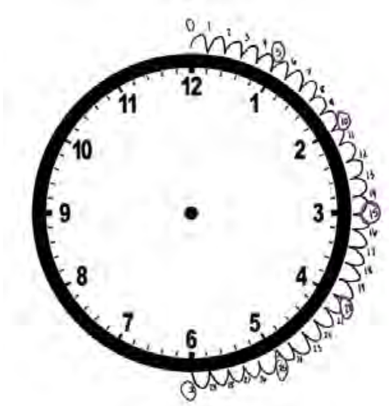
Let's Talk (Slide 4): What are the ways to count the minutes on a clock? Possible Student Answers/Key Points:

- Count every tick mark by 1s
- Count the hour markers by 5s
- Count halves by 30 and 30
- Count by 5s and then 1s



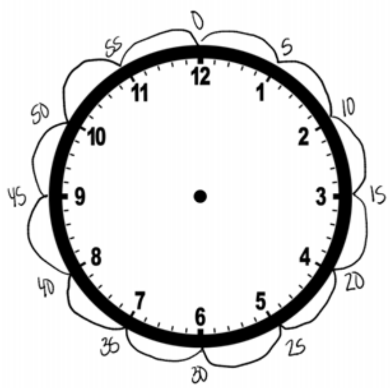
Interesting ideas! You are right that there are many ways to count minutes on a clock. The longest way is to count by 1s. Let's count the minutes by 1s. You count out loud and I'll draw hops. Make sure we start at 12 which is 0. Count: 0, 1, 2, 3….60. How many minutes are there on a clock? 60 total minutes. Yes there are 60 minutes.

You may notice that 60 and 0 are the same. That's why there's never a 4:60 or 2:60. The minutes go up to 59 and then start over at 00 or o'clock.



What do you notice about the minutes that land on the large numbers like 1, 2, 3 (*point to the hours*). I'll circle them so it's more clear. What do you notice about these numbers? They're all 5s, they skip count by 5s.

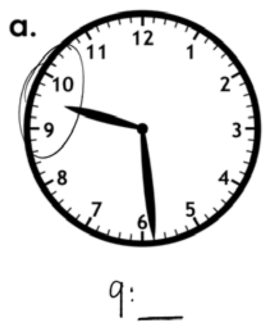
Correct, all the minutes that land on the hour tick marks are 5s. This is very helpful because we know how to skip count by 5s. So instead of counting 1, 2, 3, 4, **5,** 6, 7, 8, 9, **10…**I can just skip count by 5!



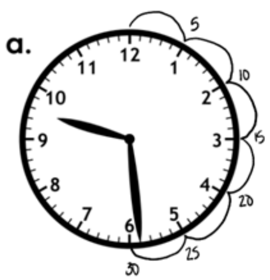
Now let's try skip counting by 5's. Let's count out loud and I'll draw hops again, bigger this time. Ready…0, 5, 10, 15, 20, 25….60. That was so much faster than counting by 1s.

Soon we're going to be counting the minutes around the clock. It can take a very long time to count by 1s every single time. However, counting by 5s can go much faster.

Let's Think (Slide 5): Using what we know about finding the hour, counting the minute hand by 5s and the fact that there are 60 minutes on the clock, I'm going to show you how to tell time to the nearest minute.



Let's start with Clock A. Just like yesterday, I'm going to begin with the hour. I see that the hour hand has passed the 9, but has not gotten to the 10 yet. That means the hour is still 9. I'm going to record that.



Now that I have my hour, I'm going to figure out how many minutes have passed. I'm going to start at 0 the same way I would on a number line. I'm going to start by skip counting by 5s since that's so much faster. I'll label the minutes as I count: 0, 5, 10, 15, 20, 25, 30. Wait, something went wrong there. Do you know what happened? You went past the minute hand/you went too far!

That's right, I jumped too far and went past the minute hand. Let me back-up. I got to 25. I know I can't jump to the next 5. So from here I'm going to keep counting by 1s: 25…26, 27, 28, 29. 29 minutes. This clock shows 9:29.

When telling time to the nearest minute, sometimes we have to use a combination of counting by 5s and 1s.

Everyone, look at Clock B and write the hour on your whiteboard or paper. I see that some of you have 4 as the hour and some of you have 5 as the hour. The hour hand can get really tricky and we have to pay special attention to it because we know it's getting closer and closer and closer to the next hour as the minute hand moves around. The hour of this clock is still 4, but you're right to know that we're getting close to 5. But here, the hour is still 4. Now, write how many minutes have passed in the hour.

So, what time does Clock B show? 4:47! Very nice! It's 4:47, which means it's getting closer and closer to 5:00 but it's not 5 until this minute hand gets to the 12?

Let's Try It (Slide 7): Let's try more telling time to the nearest minute. Remember we'll start with the hour and then the minutes every time. When we're counting how many minutes have passed, sometimes we'll use a combination of counting by 5s and then skip over to 1s.

WARM WELCOME

Today we will tell time to the nearest minute.

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Let's Review:

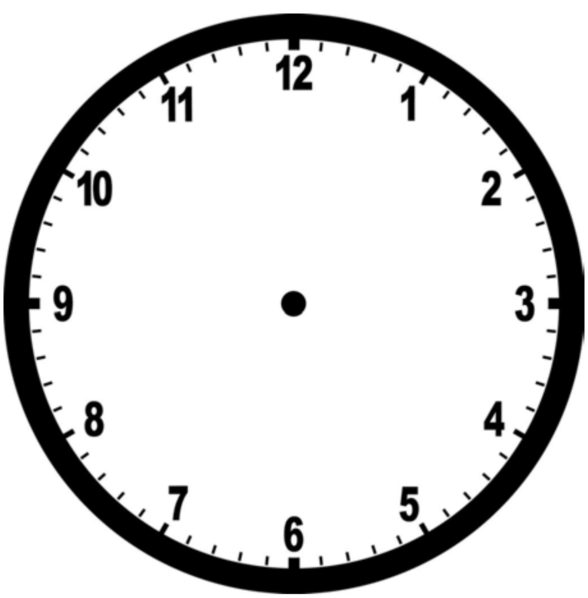
What time is shown on each clock? How do you know?

A

B

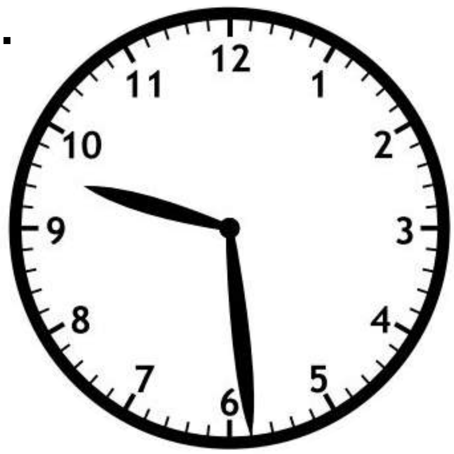
Let's Talk:

What are the ways we can count minutes on a clock?



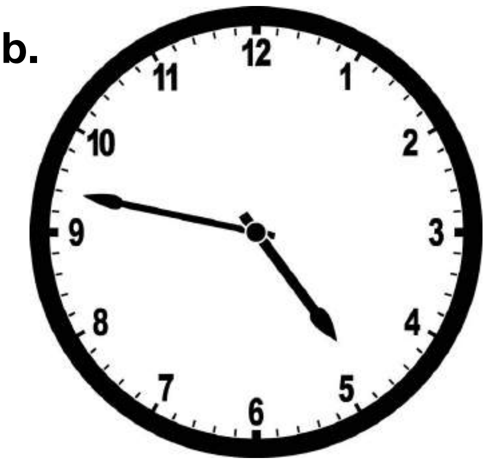
Let's Think: What time is shown?

a.



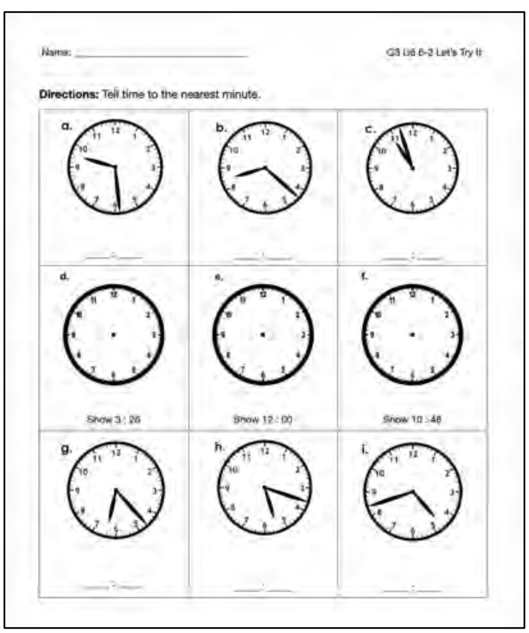
_____ : _____

b.



_____ : _____

Let's Try It: Let's apply our understanding together.



Name: ____________________ G3 U6 6-2 Let's Try It

Directions: Tell time to the nearest minute.

a. b. c.

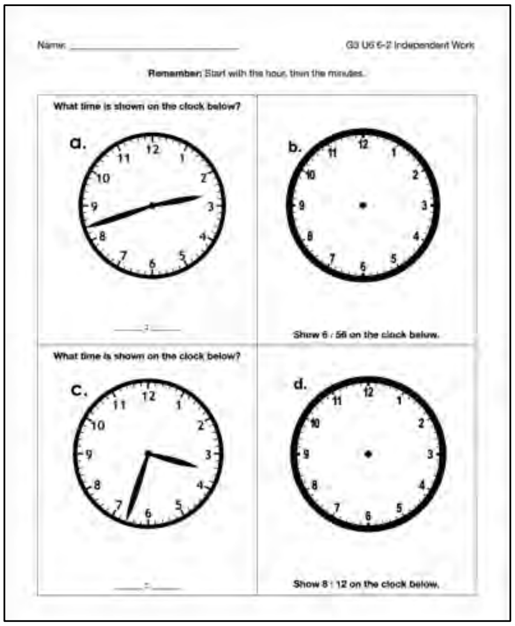
d. e. f.

Show 3 : 26 Show 12 : 00 Show 10 : 48

g. h. i.

On your Own:

Now it's time to try on your own.


Name: ____________________ G3 U6 6-2 Independent Work

Remember: Start with the hour, then the minutes.

What time is shown on the clock below?

a.

____ : ____

b.

Show 6 : 56 on the clock below.

What time is shown on the clock below?

c.

____ : ____

d.

Show 8 : 12 on the clock below.

Let's apply our understanding together.

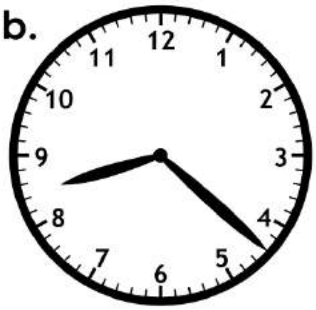
Name: ________________________________

Directions: Tell time to the nearest minute.

a.

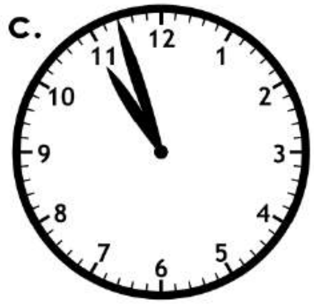
_____ : _____

b.



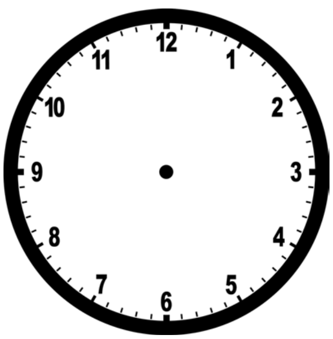
_____ : _____

c.



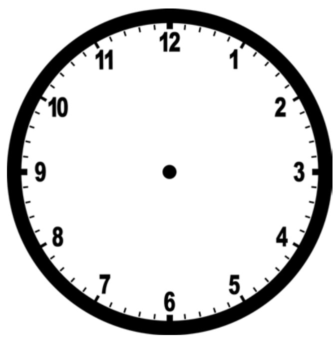
_____ : _____

d.



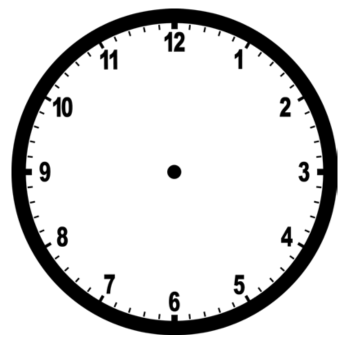
Show 3 : 26

e.



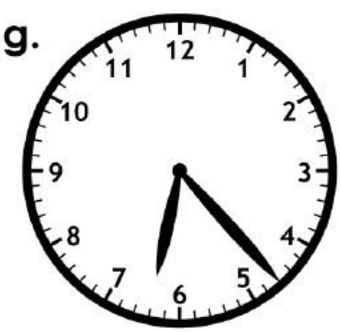
Show 12 : 00

f.



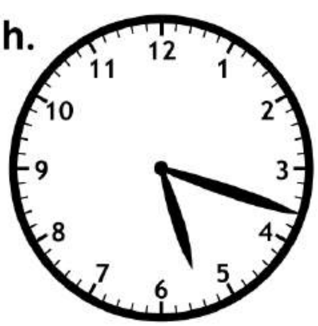
Show 10 : 48

g.



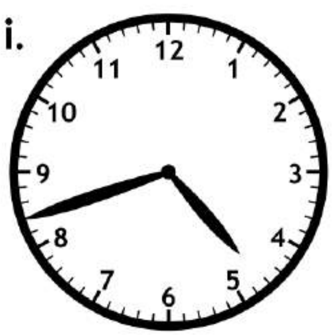
_____ : _____

h.



_____ : _____

i.



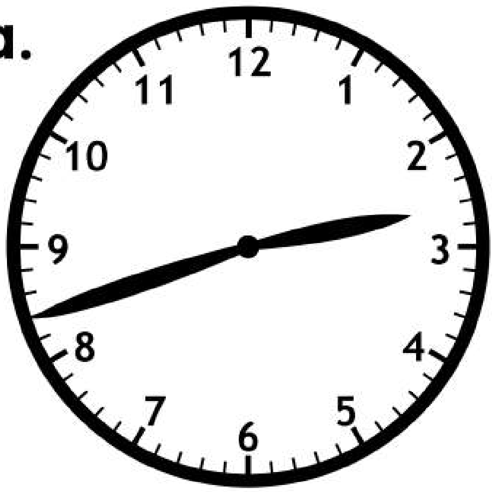
_____ : _____

Name: ______________________________

Remember: Start with the hour, then the minutes.

What time is shown on the clock below?

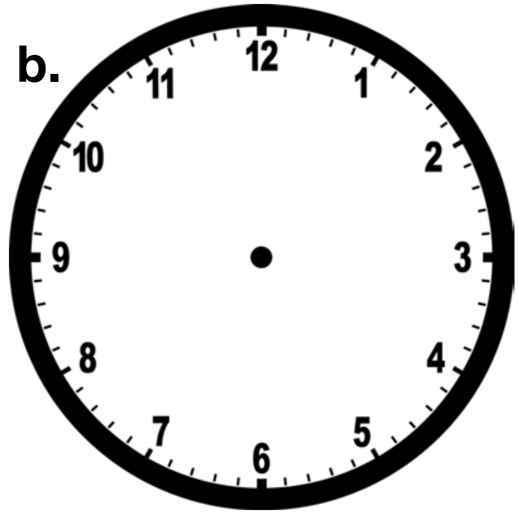
a.



_____ : _____

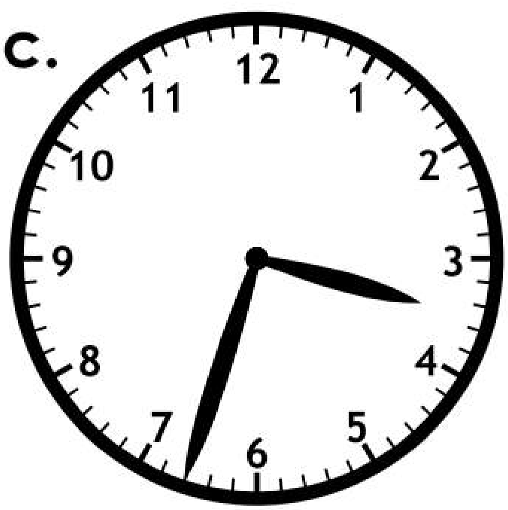
Show 6 : 56 on the clock below.

b.



What time is shown on the clock below?

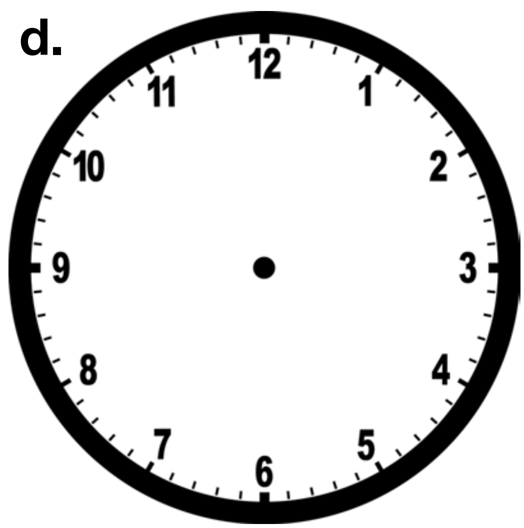
c.



_____ : _____

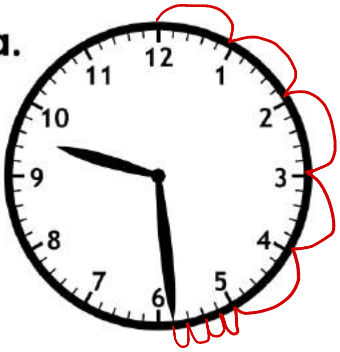
Show 8 : 12 on the clock below.

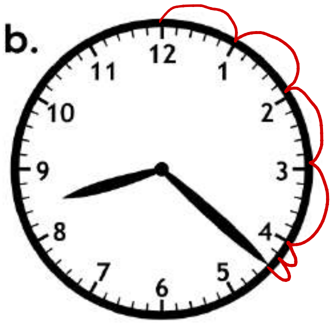
d.

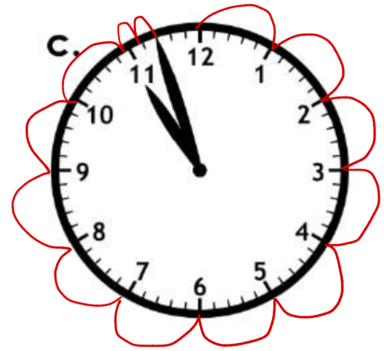


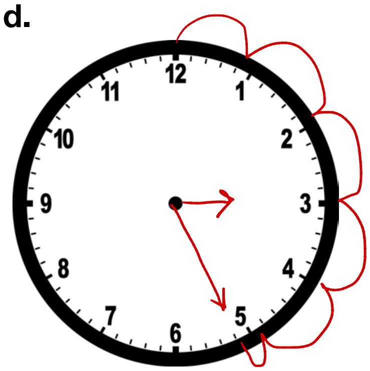
Name: ______________________________

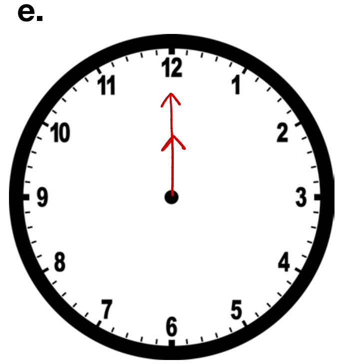
Directions: Tell time to the nearest minute.

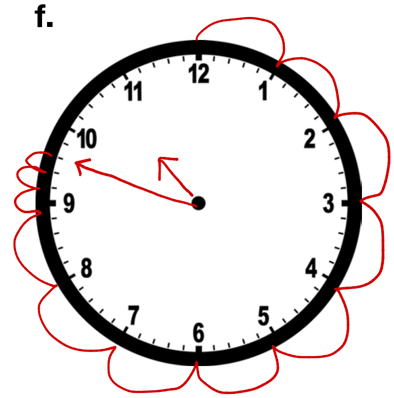
a.

9 : 29

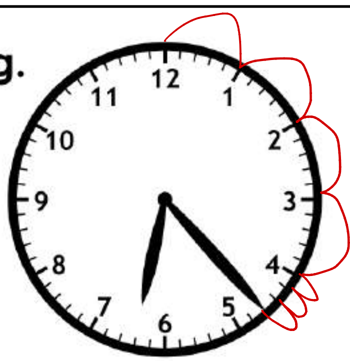
b.

8 : 22

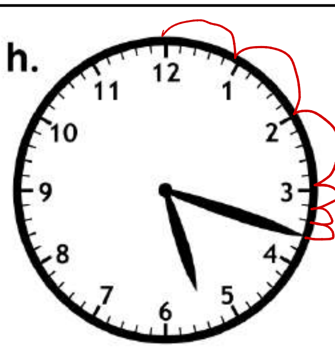
c.

10 : 56

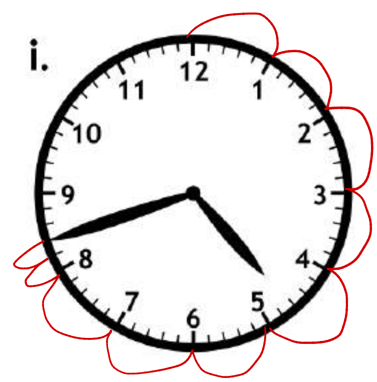
d.

Show 3 : 26

e.

Show 12 : 00

f.

Show 10 : 48

g.

6 : 24

h.

5 : 18

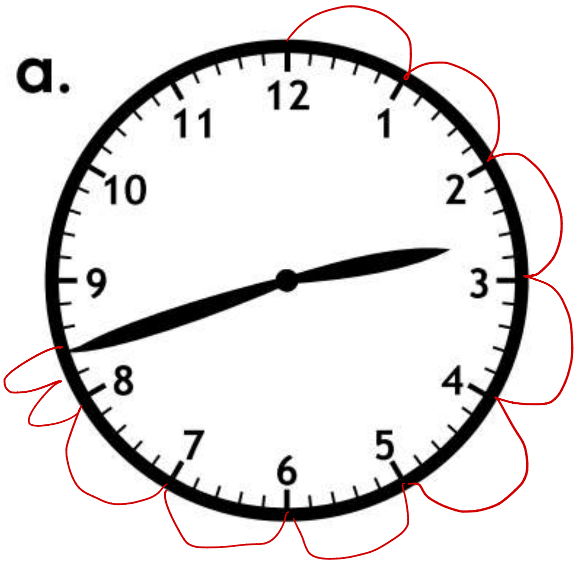
i.

4 : 42

Name: ______________________________ G3 U6 Lesson 2 - Independent Work

Remember: Start with the hour, then the minutes.

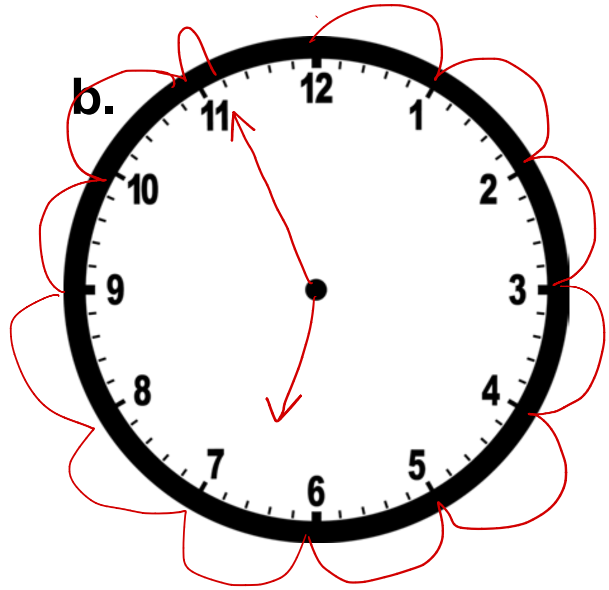
What time is shown on the clock below?

a.



2 : 42

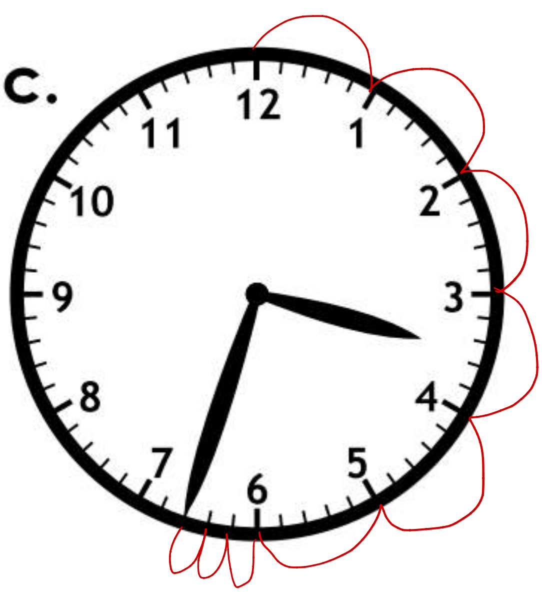
b.



Show 6 : 56 on the clock below.

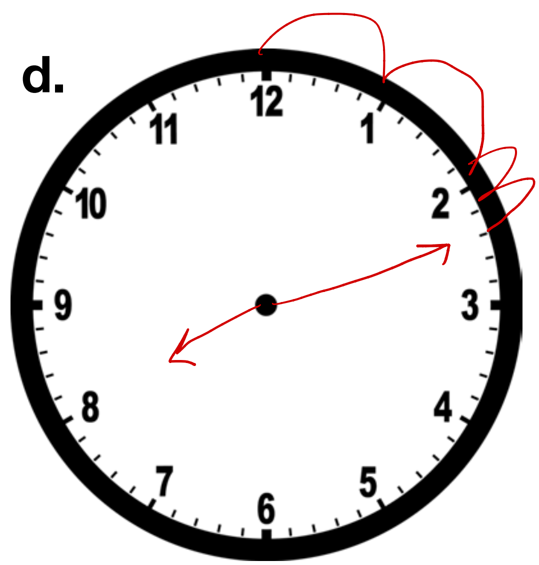
What time is shown on the clock below?

c.



3 : 33

d.



Show 8 : 12 on the clock below.

G3 U6 Lesson 3

Tell time to the quarter hour (half past, quarter past, quarter til)

CITYTUTOR DC

G3 U6 Lesson 3 - Students will tell time to the quarter hour.

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): We're going to continue telling time today. We've told time to the hour, half hour, and nearest minute. Today we'll tell time to the quarter hour, another special way to name times.

Let's Review (Slide 3): Let's go back to one of the special ways we learned how to label time. We learned about times that end in :30. An example is 2:30. What else would we call 2:30? Half past 2. Yes! Why do we call it half past 2? Half the minutes have passed/half the hour has passed.

Correct, 2:30 is also called half past 2 because half the hour has already passed. Half the minutes have already passed between 2:00 and 3:00.

Let's Talk (Slide 4): We've seen that clocks can be divided in half. But clocks can also broken into fourths or quarters. As you can see on this clock, it's divided into 4 equal parts, which are called fourths or quarters. We knew that there were 30 minutes in half. **How many minutes are there in each quarter?**

- Let's skip count to figure it out: 5, 10, 15. So, 15 minutes in the first quarter.
- Let's keep going, 5, 10, 15. Another 15 minutes in the second quarter.
- Let's keep going, 5, 10, 15. Another 15 minutes in the third quarter.
- Last one, 5, 10, 15. And, 15 minutes in the last quarter. How many minutes are there in a quarter? 15 minutes!

So, there are 15 minutes in each quarter. So the first quarter is :15 minutes in, the second quarter is after ANOTHER 15 minutes which brings us to 30 minutes into the hour and the third quarter is after ANOTHER 15 minutes which is at :45 minutes into the hour.

Let's Talk (Slide 5): Now that we know that there are 4 quarters, let's talk about the name of each quarter. Let's think the two o'clock hour. When the minute hand is at 12 it's 2:00. Then, at 2:15, you can see that one quarter of the hour has passed *(air trace the first quarter of the clock)*. Because one quarter has passed, we call it "quarter past 2." A quarter of the minutes have passed in the 2:00 hour.

You know the name of the next one. What do we call it when this many minutes have passed? Half past. Correct, we call it half past. Two quarters is the same as half. Half the hour has passed, so we call that one "half past 2." Half the minutes have passed in the 2:00 hour.

The final one is tricky. After 3 quarters have passed, there is one more quarter left UNTIL the next hour. We're very close to the next hour. Instead of saying how many quarters have passed, we say that there is one quarter left UNTIL the next hour, since so much time has passed. We say quarter TIL 3, because there is one more quarter UNTIL the hour changes to 3. That name is VERY tricky, because it sounds like the hour is 3, but it's actually still 2.

So, at 15 minutes, we are a QUARTER PAST. At 30 minutes, we are HALF PAST. At 45 minutes, we are a quarter UNTIL the next hour.

Let's Think (Slide 6): I need to figure out what time is on each clock. Then I need to write the special name in quarters. The first part we've gotten pretty good at.

- Blue Clock: Let's all write the time that we see on the blue clock as a digital time like this, ___:___. So, what time is on the blue clock? 5:15! That's right, and what's another way to say the time 5:15? Quarter past 5!
- Green Clock: Let's all write the time that we see on the green clock as a digital time like this, ___:___. So, what time is on the blue clock? 10:45! That's right, it's 10:45 not 11:45 but we're getting close, close, close to 11, which will help us say this time in a special way. What's another way to say the time 5:15? Quarter til 11!
- Purple Clock: And finally the purple clock. This is going backwards, we have the special time but we need to show it on the digital and analog clock. The special time says half past 3. What time is that? 3:30! That's right, it's halfway between 3 and 4, which means it's 3:30. Someone come draw the hands on the clock to show 3:30.

Let's Try It (Slide 7-8): Telling time to the quarter hour is definitely tough. It's easier if you remember each phrase and the minutes. Quarter past is 15 minutes where the big 3 is. Half past is 30 minutes where the big 6 is and quarter till is 45 minutes where the big 9 is. Let's practice some more together.

WARM WELCOME

Today we will tell time to the quarter hour.

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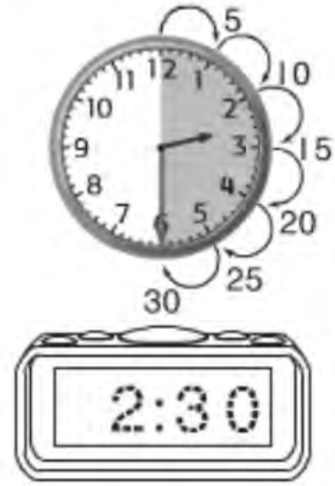
Let's Review:

Times that end in :30 have a special name.

2:30 is also known as

________ ________ ____

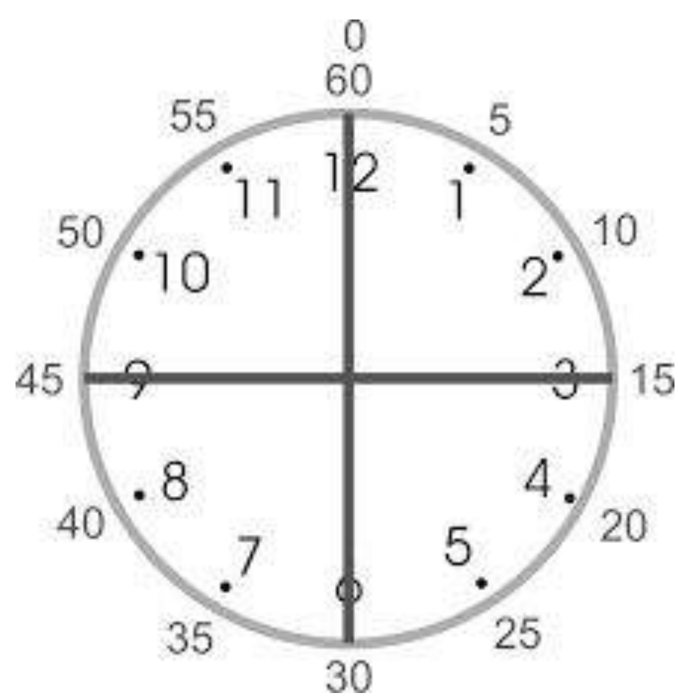


30 minutes after two

Let's Talk:

Clocks are broken into quarters.

How many minutes are in each quarter (fourth)?



Let's Think: Each quarter has a special name.

15 minutes after two | 30 minutes after two | 45 minutes after two

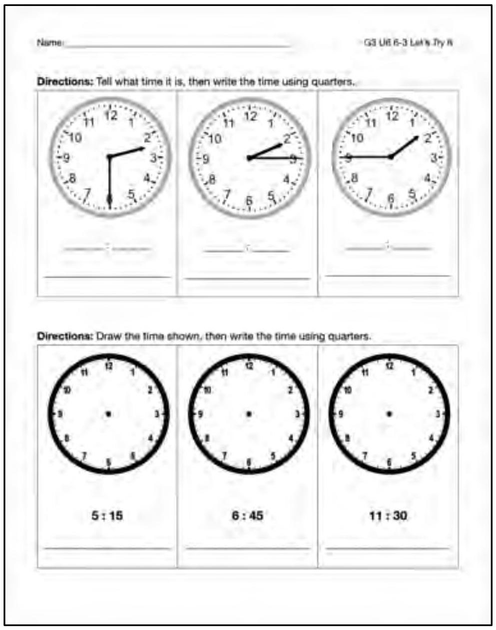
_______________ _______________ _______________

Let's Think: What time is on each clock?
What's the special name?

_______________ _______________ half past 3

Let's Try It:

Let's apply our understanding together.



Name: ______________________ G3 U6 6-3 Let's Try It

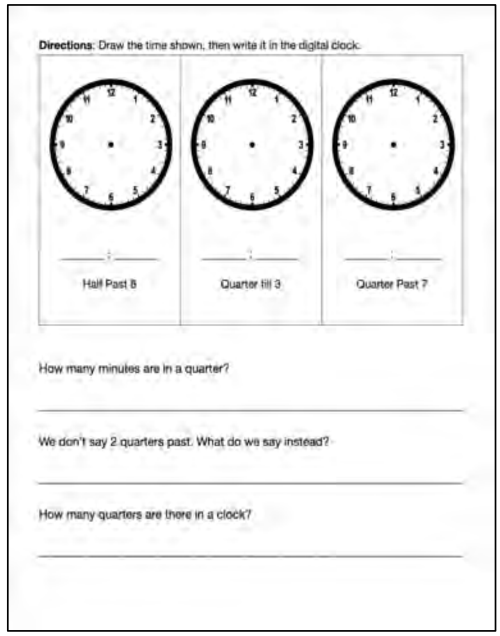
Directions: Tell what time it is, then write the time using quarters.

Directions: Draw the time shown, then write the time using quarters.

5 : 15

6 : 45

11 : 30



Directions: Draw the time shown, then write it in the digital clock.

Half Past 8

Quarter till 3

Quarter Past 7

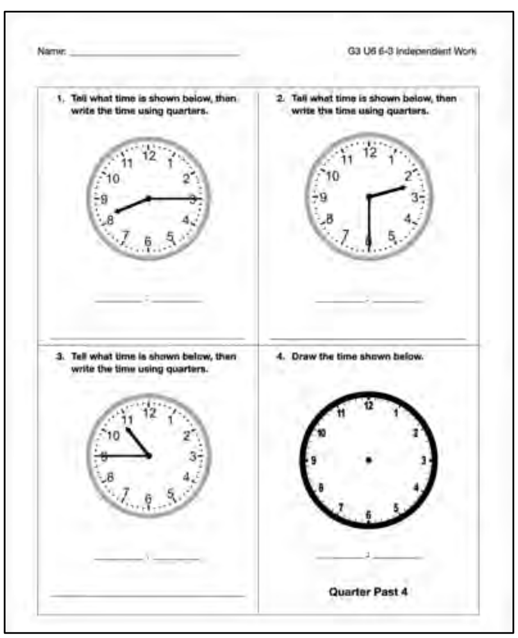
How many minutes are in a quarter?

We don't say 2 quarters past. What do we say instead?

How many quarters are there in a clock?

On your Own:

Now it's time to try on your own.



Name: ______________________ G3 U6 6-3 Independent Work

1. Tell what time is shown below, then write the time using quarters.
2. Tell what time is shown below, then write the time using quarters.
3. Tell what time is shown below, then write the time using quarters.
4. Draw the time shown below.

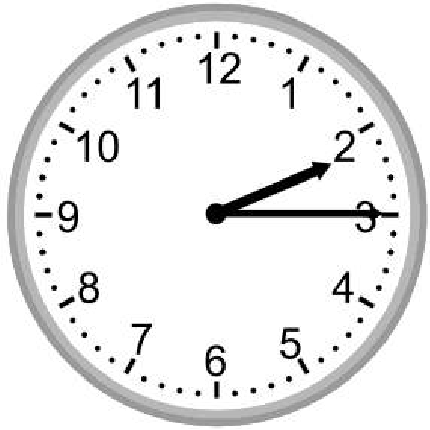
Quarter Past 4

Name: ____

Directions: Tell what time it is, then write the time using quarters.

_______ : _______

____



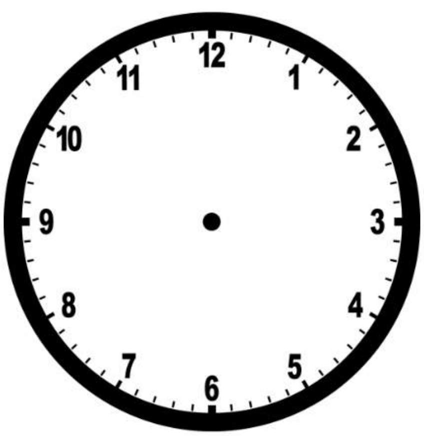
_______ : _______

____

_______ : _______

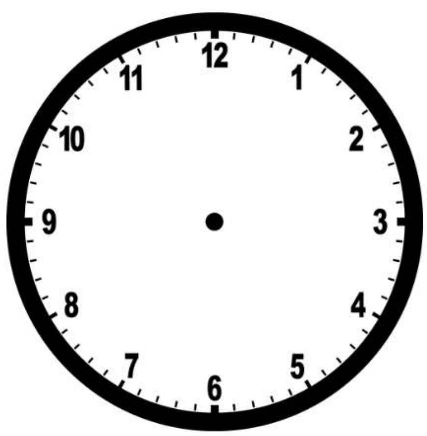
____

Directions: Draw the time shown, then write the time using quarters.



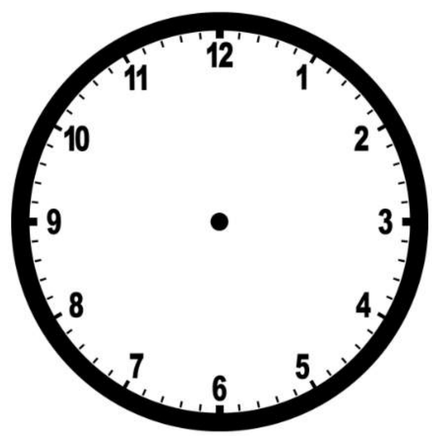
5 : 15

____



6 : 45

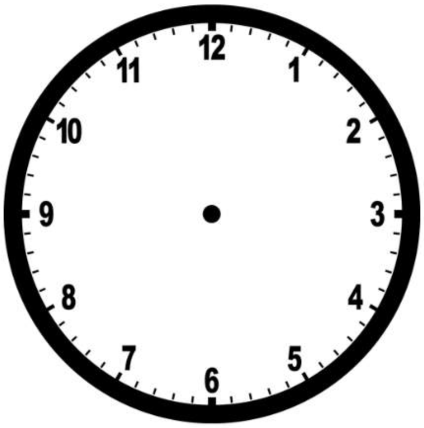
____



11 : 30

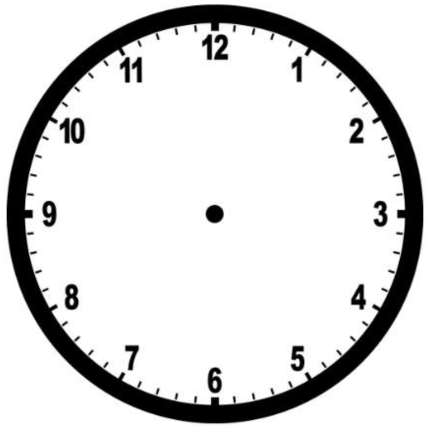
____

Directions: Draw the time shown, then write it in the digital clock.



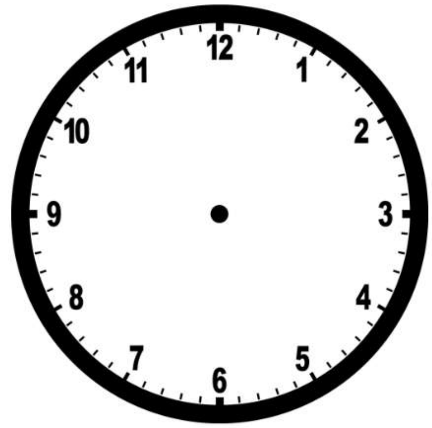
_______ : _______

Half Past 8



_______ : _______

Quarter till 3



_______ : _______

Quarter Past 7

How many minutes are in a quarter of an hour?

____

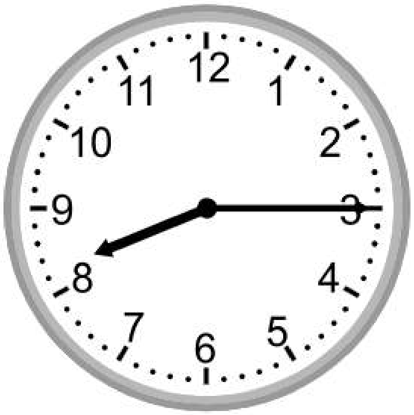
We don’t say 2 quarters past. What do we say instead?

____

How many quarters are there in a clock?

____

1. Tell what time is shown below, then write the time using quarters.



________ : ________

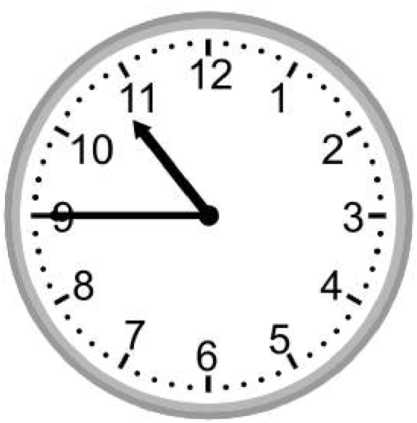
____

2. Tell what time is shown below, then write the time using quarters.

________ : ________

____

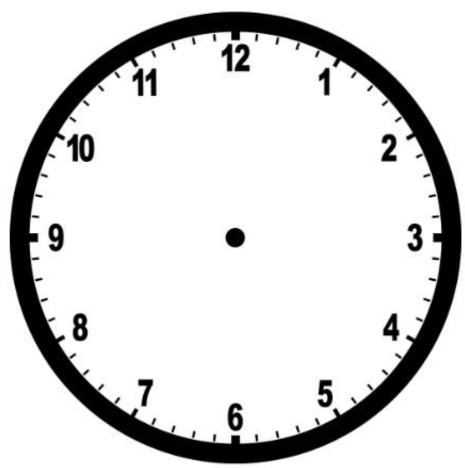
3. Tell what time is shown below, then write the time using quarters.



________ : ________

____

4. Draw the time shown below.



________ : ________

Quarter Past 4

Name: ____________________ G3 U6 Lesson 3 - Let's Try It

Directions: Tell what time it is, then write the time using quarters.

2 : 30

half past 2

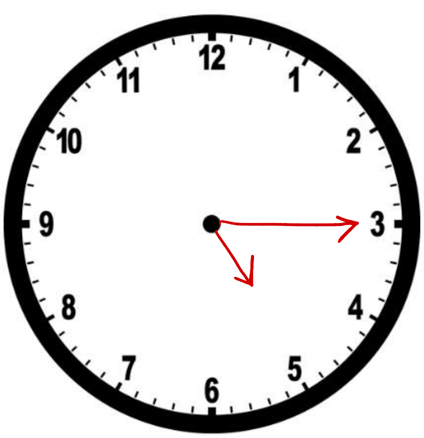
2 : 15

quarter past 2

1 : 45

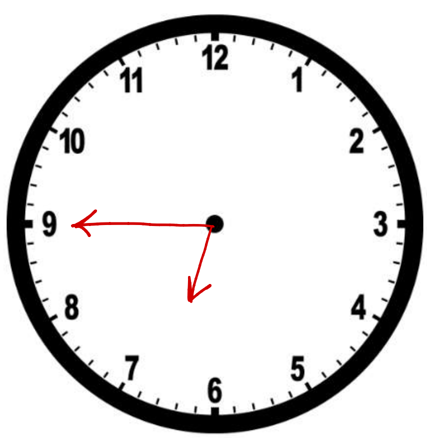
quarter till 2

Directions: Draw the time shown, then write the time using quarters.



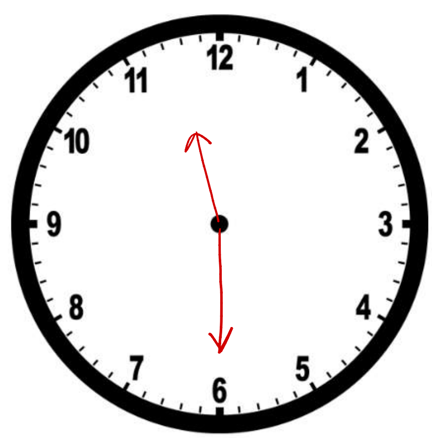
5 : 15

quarter past 5



6 : 45

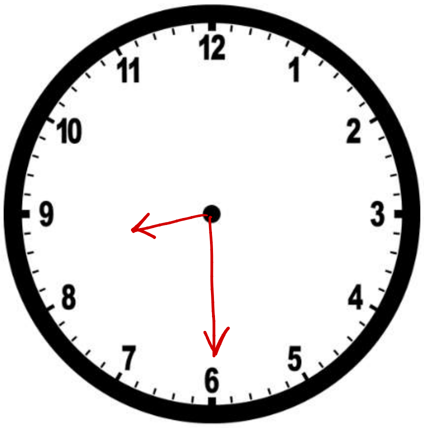
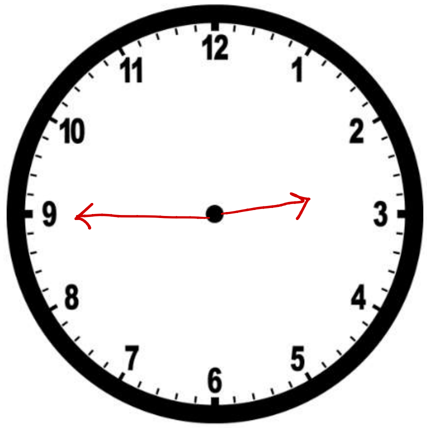
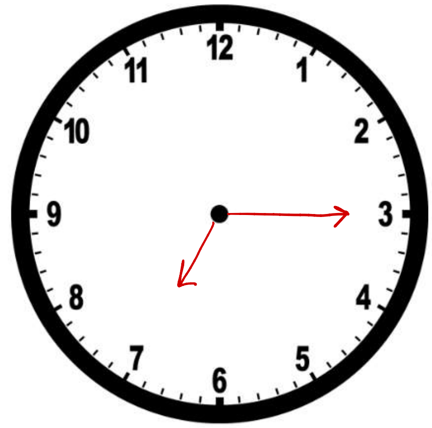
quarter till 7



11 : 30

half past 11

Directions: Draw the time shown, then write it in the digital clock.

		
8 : 30	2 : 45	7 : 15
Half Past 8	Quarter till 3	Quarter Past 7

How many minutes are in a quarter?

15 minutes

We don’t say 2 quarters past. What do we say instead?

Half past

How many quarters are there in a clock?

4 quarters

1. Tell what time is shown below, then write the time using quarters.

8 : 15

quarter past 8

2. Tell what time is shown below, then write the time using quarters.

2 : 30

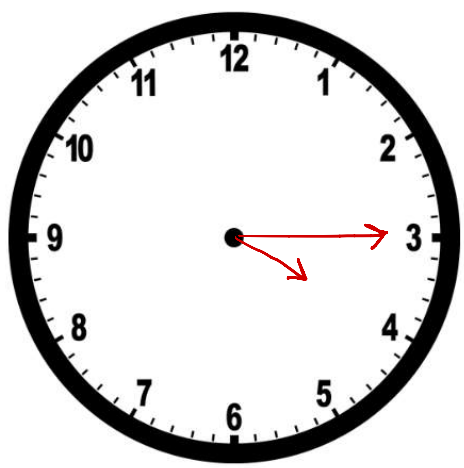
half past 2

3. Tell what time is shown below, then write the time using quarters.

11 : 45

quarter till 12

4. Draw the time shown below.



4 : 15

Quarter Past 4

G3 U6 Lesson 4

Solve word problems with time intervals within 1 hour (find start and end time)

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G3 U6 Lesson 4 - Students will solve word problems with time intervals (finding start and end time)

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): Today we will continue learning about time. Instead of reading clocks, we will solve word problems using something called time intervals.

Let's Talk (Slide 3): **Think of an example of time passing.** Possible Student Answers, Key Points:

- When we go to recess at 12:00, we come back and it's later in the day.
- Every year we get a year older on our birthdays.
- When we go to sleep we wake up many hours later.
- When we get in the car to drive somewhere, we have to wait a long time.

Those are all wonderful examples. Tne of the most important things to remember about time is that time passes. That's why clocks are so important because we constantly have to know what time it is, because the time changes as time passes.

Let's Think (Slide 4): Today we will be trying to calculate start and end times in word problems. Everything we do starts and ends. We start brushing our teeth and eventually stop brushing our teeth. Recess starts at school and unfortunately it ends each day.

Let's think more about recess. Let's say recess starts every day at 2:00 *(write 2:00 under starts)* and lasts 30 minutes *(write 30 minutes on top of the arrow)*. I want to figure out what time recess ends. I have to move forward on the timeline like I would move forward on a number line. Would I add or subtract minutes to 2:00 to figure out what time recess ends *(points to end)*? You would add time.

Correct, we have to move forward in time to get to the end, just like we'd move forward on a number line. We always add time when we're moving forward.

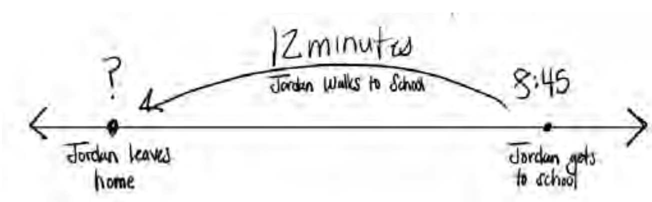
Let's Think (Slide 5): Let's think about recess again. Let's say recess ends every day at 1:30 *(write 1:00 under ends).* Recess is still 30 minutes long *(write 30 minutes on top of the arrow)*. But this time I want to figure out what time recess started. I have to move backwards in time and backwards on the timeline. Would I add or subtract minutes to figure out what time recess starts *(point to starts)*? You would subtract time.

Correct, we have to move backwards in time to get to the start, just like we'd move backwards on a number line. We always subtract when we move backwards.

Let's Think (Slide 6): Let's try this first word problem. Just like every word problem, the first thing I do is read it aloud*,* "Jordan gets to school every day at 8:45. It only takes him 12 minutes to walk from his house to school. What time does he leave his house every morning?"

The next thing I do is retell it to myself to make sure I understand it. So, Jordan gets to school at a certain time. It takes him 12 minutes to get to school. I need to find out what time he leaves his house.

Because this is a time interval word problem, I'm going to make a timeline to help me keep track of the times in the start time, end time and elapsed time, how much time goes by. I'm going to mark the two times, when Jordan leaves and when he gets to school because that is what this problem is about.



I know Jordan would leave his house first so I'm going to mark that on the number line first, that must be my start time. I also don't know what time he left so I'm going to write a question mark to show I don't know.

I know he will get to school AFTER he leaves his house, so I'm going to plot it on the timeline AFTER. I'm going to write the time 8:45 since I know that's the time he got to school.

Finally, it says it took him 12 minutes to walk to school. I'm going to write that in the middle since he would walk in the middle of leaving his house and getting to school.

Finally I'm going to draw an arrow from the time we know to the time we don't know. I see the arrow is going backwards which means we're moving backwards in time. I know if we're moving backwards then we must be subtracting. I need to take away 12 minutes.

time	minutes
8:45	
	- 10
8:35	
	- 2
8:33	

Now that I see I'm trying to figure out a start time, I know I need to subtract minutes, the same way I would subtract to move backwards on a number line. Subtracting time isn't like subtracting normal numbers in the ones, tens, hundreds and thousands. It's tricky because the minutes only go to 60, so I'm going to use a t-chart to help me. On the left side, I'm going to write the times. On the right side, I'm going to write the minutes I'm subtracting.

I know I need to start at 8:45 so I'm going to write that as my first time. I need to subtract 12 minutes. I'm going to subtract it in easy parts. I'll start by subtracting 10 minutes. I'm going to write -10 on the minutes side to help me keep track of what I subtract…8:45 minus 10 minutes is 8:35. I'm going to update my time to 8:35.

I only subtracted 10 minutes but I need to subtract 12 minutes. I need to subtract 2 more minutes. I'm going to draw a line from 8:35 to the minutes side and subtract 2 more minutes. When I subtract 2 minutes from 8:35, the new time is 8:33. I subtracted 12 minutes, I'm done. 8:33 is my answer, 8:33 is when Jordan left his house.

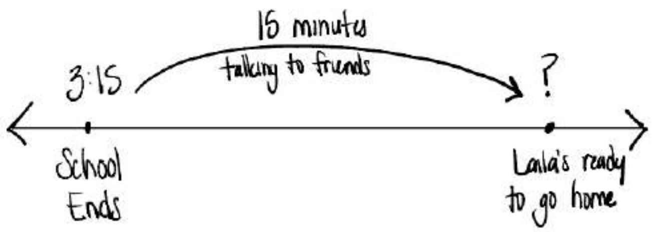
8:45 - 12 minutes = 8:33

The time was 8:33 when Jordan left his house. I end every word problem with an equation to represent my work. I'm going to do the same here. Jordan got to school at 8:45, it took him 12 minutes to walk which means he left at 8:33.

Let's Think (Slide 7): Let's try another one. I always start by reading the word problem aloud to myself.

Then I retell the story to make sure I understand the problem. Laila's school ends at a certain time. She stays after school talking to friends for 15 minutes. I need to figure out what time Laila is done talking to her friends after school.

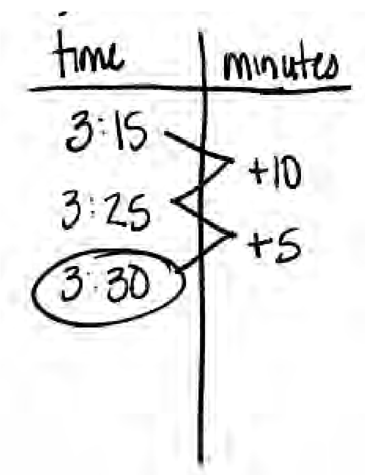
Because this is a time interval word problem, I'm going to make a number line to help me keep track of the start time, end time and elapsed time, how much time went by.



I know school would end first, then Laila would talk to her friends, then she would be ready to go home. I'm going to plot school ends first and I'm going to write the time 3:15 since I know when it ended.

I'm going to plot Laila's ready to go home AFTER. I'm going to put a question mark on top since I don't know what time she was ready to go home. I'm going to put 15 minutes in the middle since that's the time she spent talking to her friends.

Finally I'm going to draw an arrow from the time we know to the time we don't know. I see the arrow is going forwards which means we're moving forwards in time. I know if we're moving forward then we must be adding. I need to add 15 minutes.



I'm going to set up the t-chart again to help me add. On the left side, I'm going to write the times. On the right side, I'm going to write the minutes I'm adding.

What time will we start with? 3:15.

Are we adding or subtracting time? Adding!

How much time are we going to add to 3:15? 15 minutes. Yes we're going to add 15 minutes, that's how long Laila talks to her friends.

Let's start again with 10 since it's easy to add 10. If I add 10 minutes to 3:15, what time will it be? 3:25. How much more time do we need to add? 5 minutes. And, 3:25 plus 5 minutes is 3:30. So, 3:30 is when Laila was ready to go.

3:15 + 15 minutes = 3:30

The time was 3:30 when Laila was ready to go home. I end every word problem with an equation to represent my work. I'm going to do the same here. School ended at 3:15, Laila kept talking to her friends for 15 more minutes and was ready to go home at 3:30.

Let's Try It (Slide 8-9): Now let's try some time interval problems together. Remember to use a timeline to help figure out whether we're going forward or backwards in time. That will let us know whether we need to add or subtract minutes.

WARM WELCOME

Today we will solve word problems with time intervals.

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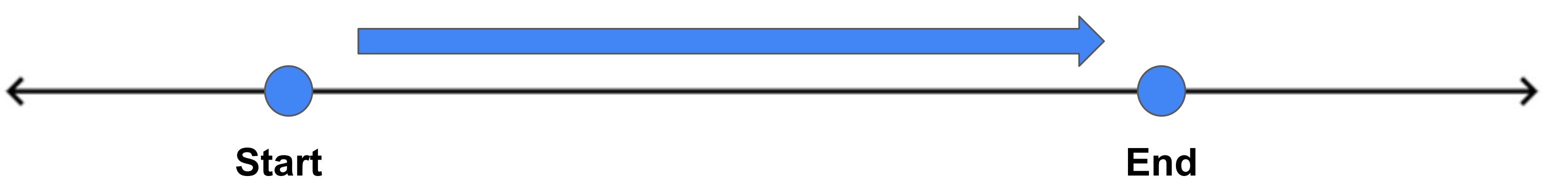
Let's Talk:

Think of an example of time passing.

Let's Think:

Recess starts at 2:00, it lasts for 30 minutes.



We ADD time as it passes FORWARD.

Let's Think:

Recess ends at 1:30, it lasts for 30 minutes.

We SUBTRACT time as we move BACKWARDS.

Let's Think:

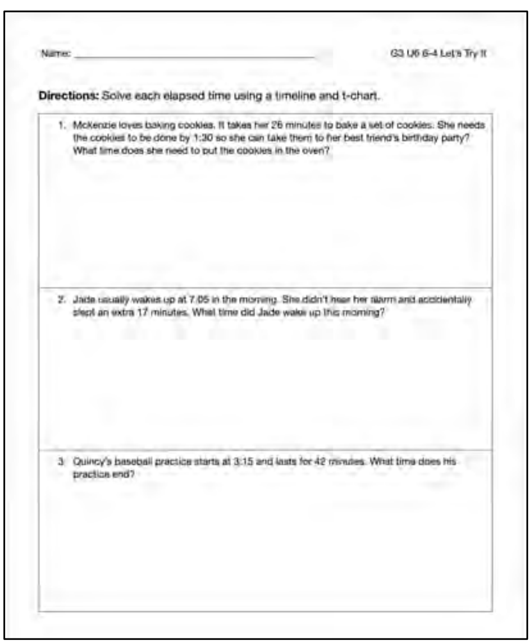
Jordan gets to school every day at 8:45. It only takes him 12 minutes to walk from his house to school. What time does he leave his house every morning?

Let's Think:

School is over at 3:15. Laila likes to stay after and talk to her friends for an extra 15 minutes. What time will Laila be ready to go home?

Let's Try It:

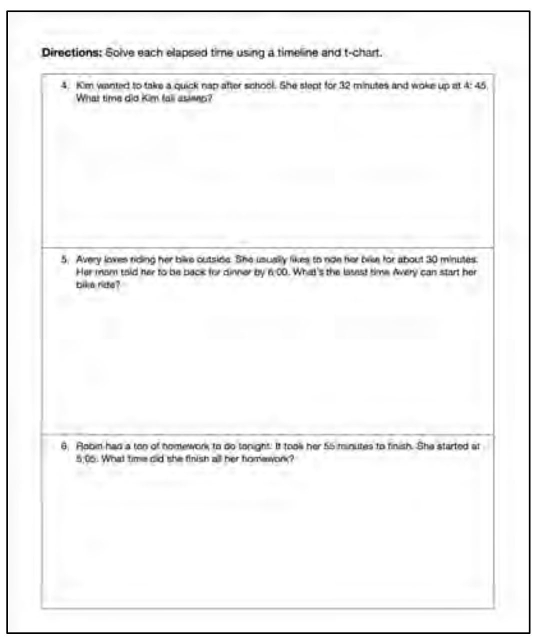
Let's apply our understanding together.



Name: ______________________ G3 U6 6-4 Let's Try It

Directions: Solve each elapsed time using a timeline and t-chart.

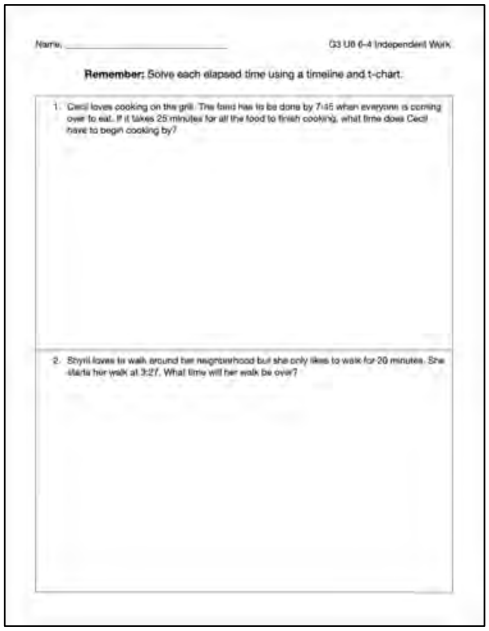
1. Mckenzie loves baking cookies. It takes her 26 minutes to bake a set of cookies. She needs the cookies to be done by 1:30 so she can take them to her best friend's birthday party? What time does she need to put the cookies in the oven?
2. Jade usually wakes up at 7:05 in the morning. She didn't hear her alarm and accidentally slept an extra 17 minutes. What time did Jade wake up this morning?
3. Quincy's baseball practice starts at 3:15 and lasts for 42 minutes. What time does his practice end?



Directions: Solve each elapsed time using a timeline and t-chart.

4. Kim wanted to take a quick nap after school. She slept for 32 minutes and woke up at 4: 45. What time did Kim fall asleep?
5. Avery loves riding her bike outside. She usually likes to ride her bike for about 30 minutes. Her mom told her to be back for dinner by 6:00. What's the latest time Avery can start her bike ride?
6. Robin had a ton of homework to do tonight. It took her 55 minutes to finish. She started at 5:05. What time did she finish all her homework?

On your Own: Now it’s time to try on your own.



Name: ______________________ G3 U8 6-4 Independent Work

Remember: Solve each elapsed time using a timeline and t-chart.

1. Cecil loves cooking on the grill. The food has to be done by 7:45 when everyone is coming over to eat. If it takes 25 minutes for all the food to finish cooking, what time does Cecil have to begin cooking by?

2. Shyril loves to walk around her neighborhood but she only likes to walk for 20 minutes. She starts her walk at 3:27. What time will her walk be over?

Directions: Solve each elapsed time using a timeline and t-chart.

1. Mckenzie loves baking cookies. It takes her 26 minutes to bake a set of cookies. She needs the cookies to be done by 1:30 so she can take them to her best friend's birthday party? What time does she need to put the cookies in the oven?

2. Jade usually wakes up at 7:05 in the morning. She didn't hear her alarm and accidentally slept an extra 17 minutes. What time did Jade wake up this morning?

3. Quincy's baseball practice starts at 3:15 and lasts for 42 minutes. What time does his practice end?

Directions: Solve each elapsed time using a timeline and t-chart.

4. Kim wanted to take a quick nap after school. She slept for 32 minutes and woke up at 4: 45. What time did Kim fall asleep?

5. Avery loves riding her bike outside. She usually likes to ride her bike for about 30 minutes. Her mom told her to be back for dinner by 6:00. What's the latest time Avery can start her bike ride?

6. Robin had a ton of homework to do tonight. It took her 55 minutes to finish. She started at 5:05. What time did she finish all her homework?

Remember: Solve each elapsed time using a timeline and t-chart.

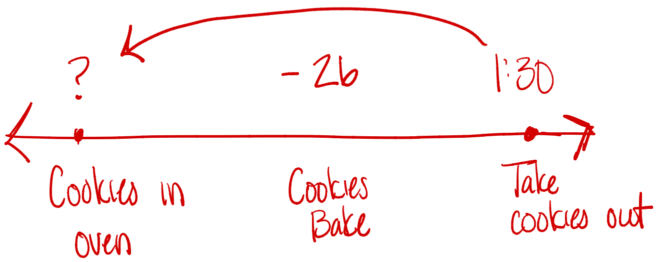
1. Cecil loves cooking on the grill. The food has to be done by 7:45 when everyone is coming over to eat. If it takes 25 minutes for all the food to finish cooking, what time does Cecil have to begin cooking by?

2. Shyril loves to walk around her neighborhood but she only likes to walk for 20 minutes. She starts her walk at 3:27. What time will her walk be over?

Name: ______________________________ G3 U6 Lesson 4 - Let's Try It

Directions: Solve each elapsed time using a timeline and t-chart.

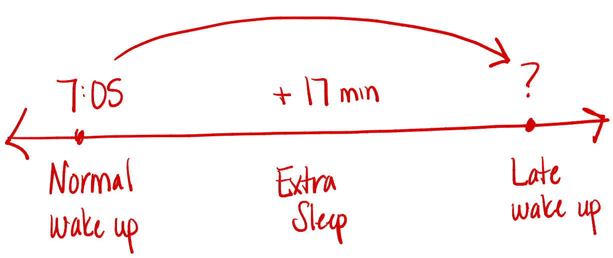
1. Mckenzie loves baking cookies. It takes her 26 minutes to bake a set of cookies. She needs the cookies to be done by 1:30 so she can take them to her best friend's birthday party? What time does she need to put the cookies in the oven?



time	minutes
1:30	
	-10
1:20	
	-10
1:10	
	-6
1:04	

1:30 - 26 minutes = 1:04

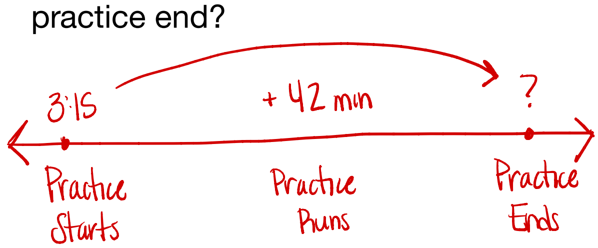
2. Jade usually wakes up at 7:05 in the morning. She didn't hear her alarm and accidentally slept an extra 17 minutes. What time did Jade wake up this morning?



time	minutes
7:05	
	+10
7:15	
	+5
7:20	
	+2
7:22	

7:05 + 17 minutes = 7:22

3. Quincy's baseball practice starts at 3:15 and lasts for 42 minutes. What time does his practice end?

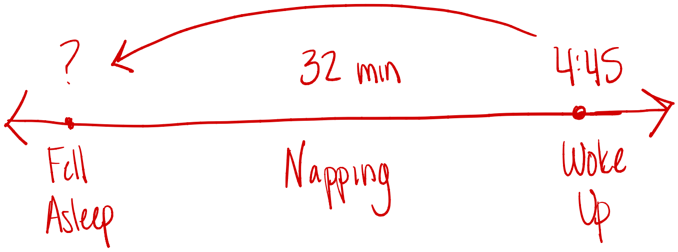


time	minutes
3:15	
	+10
3:25	
	+10
3:35	
	+10
3:45	
	+10
3:55	
	+2
3:57	

3:15 + 42 minutes = 3:57

Directions: Solve each elapsed time using a timeline and t-chart.

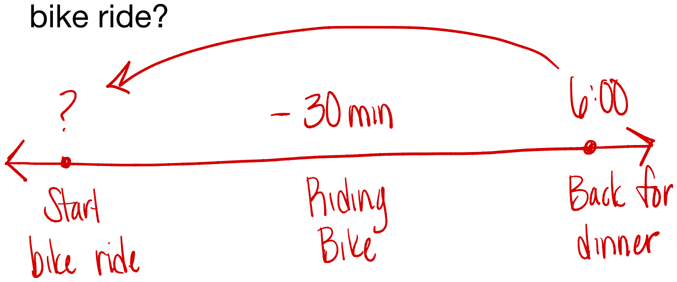
4. Kim wanted to take a quick nap after school. She slept for 32 minutes and woke up at 4: 45. What time did Kim fall asleep?



time	minutes
4:45	
4:35	-10
4:25	-10
4:15	-10
4:13	-2

4:45 - 32 minutes = 4:13

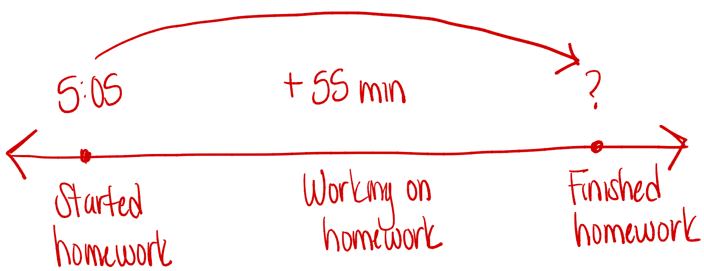
5. Avery loves riding her bike outside. She usually likes to ride her bike for about 30 minutes. Her mom told her to be back for dinner by 6:00. What's the latest time Avery can start her bike ride?



time	minutes
6:00	
5:50	-10
5:40	-10
5:30	-10

6:00 - 30 minutes = 5:30

6. Robin had a ton of homework to do tonight. It took her 55 minutes to finish. She started at 5:05. What time did she finish all her homework?



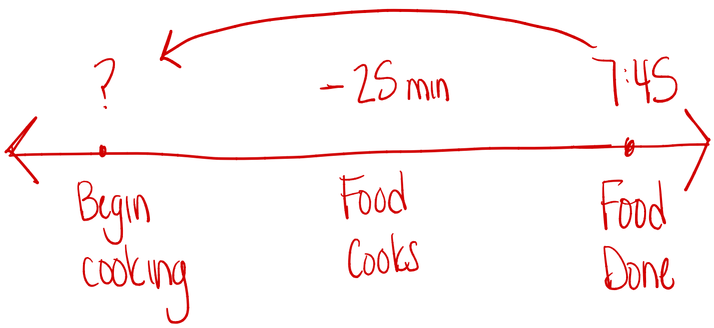
time	minutes
5:05	
5:15	+10
5:25	+10
5:35	+10
5:45	+10
5:55	+10
6:00	+5

5:05 + 55 minutes = 6:00

Name: ______________________________ G3 U6 Lesson 4 - Independent Work

Remember: Solve each elapsed time using a timeline and t-chart.

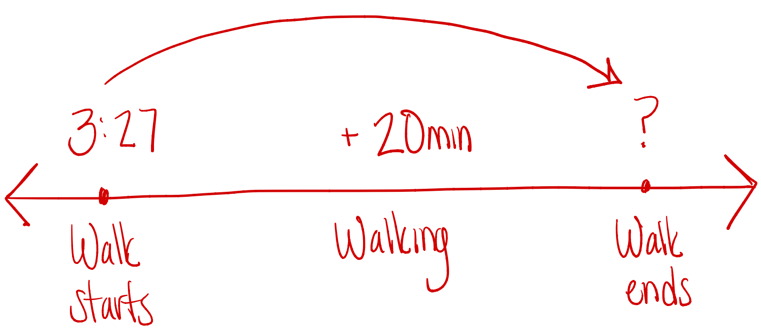
1. Cecil loves cooking on the grill. The food has to be done by 7:45 when everyone is coming over to eat. If it takes 25 minutes for all the food to finish cooking, what time does Cecil have to begin cooking by?



time	minutes
7:45	- 10
7:35	- 10
7:25	- 5
7:20	

7:45 - 25 minutes = 7:20

2. Shyril loves to walk around her neighborhood but she only likes to walk for 20 minutes. She starts her walk at 3:27. What time will her walk be over?



time	minutes
3:27	+10
3:37	+10
3:47	

3:27 + 20 minutes = 3:47

G3 U6 Lesson 5

Solve word problems with time intervals within 1 hour (find elapsed time)

G3 U6 Lesson 5 - Students will solve word problems with time intervals (finding elapsed time)

Warm Welcome (Slide 1): Tutor choice

Frame the Learning/Connect to Prior Learning (Slide 2): Yesterday we solved time interval problems using a timeline and t chart. We found the start time or end time in each problem. Today we're going to continue solving time interval problems, but instead we're going to find a different piece of information.

Let's Talk (Slide 3): Everyday we participate in activities that last a certain amount of time. You're getting older now, so you're probably starting to notice how long things last. Some activities take a long time and others take a short amount of time. **Can you give me some examples of activities you do and how long you think they take?** I'll give you an example, everyday I brush my teeth. I don't know exactly how long it takes, but I think it's about 5 minutes. Everyday I eat my lunch, it takes about 20 minutes. **What about you, what do you do each day and how long does it take?**

You just named so many activities and how long they last. When we talk about how long something lasts, we're talking about the elapsed time, the amount of time that passed. Today we're going to be talking more about elapsed time.

Let's Review (Slide 4): Yesterday we were given the start time and the amount of time passed and had to figure out the end time. Other times, we were given the end time and amount of time passed and had to figure out the start time.

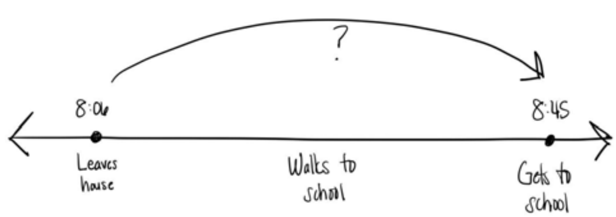
Let's Talk (Slide 5): Sometimes we were given the start time, sometimes we were given the end time. What's the other piece of information we were given every single time? We were told how much time passed/how much time it took!

Correct, in every single word problem, they told us a number of minutes that passed. Today, we're going to figure out how much time passed, instead of the start time or end time. So, we'll know the start time AND the end time and we'll have to figure out elapsed time, or how much time has passed.

Let's Think (Slide 6): Let's try this first word problem. Just like every word problem, the first thing I do is read it aloud, "Jordan gets to school every day at 8:45. He leaves the house at 8:06 in the morning. How long does it take him to walk from his house to school?"

The next thing I do is retell it to myself to make sure I understand it. Jordan leaves home at a certain time every morning. He gets to school at a certain time every morning. I need to figure out how long it takes him to walk from home to school every day.

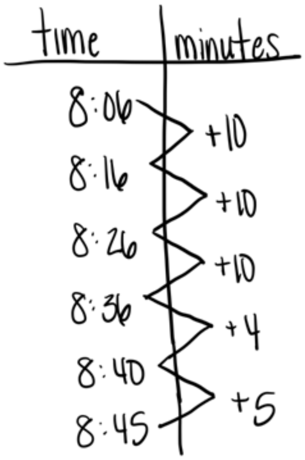
Because this is a time interval word problem, I'm going to make a timeline to help me put the events in the right order. I know Jordan would leave his house first, then walk to school, then get to school. I'm going to write the events on my timeline in that order.



First, I'll mark that he leaves home at 8:06. AFTER I'll mark that he walks, in the middle. I'll also write a question mark since I don't know how long he walks for. LAST I'll mark that he gets to school at 8:45.

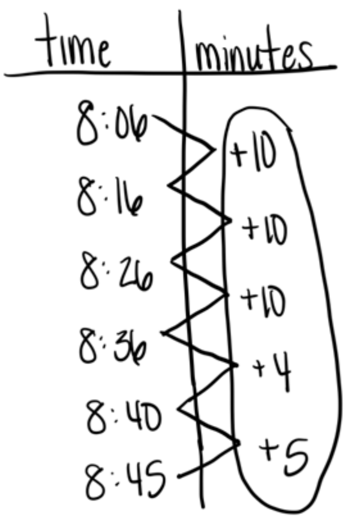
Now I can clearly see the order of events? Now I also see that I have the start time and end time, I'm trying to figure out the elapsed time, or how much time has passed in the middle.

I have the option to add or subtract, but I'm going to add since we all tend to make fewer mistakes when we add. I'll begin by setting up my t-chart just like before. One side will help me keep track of the time and the other side will help me keep track of minutes.



Now I'm ready to begin adding. I'll begin with my start time 8:06 and I'll keep adding minutes until I reach my end time at 8:45. Then I'll see how much time I added to find my elapsed time. Just like before, I'm going to add in chunks. I'll by adding 10s since they're easy to add. 8:06 + 10 minutes is 8:16. I can keep adding until I get to 8:45.

Okay, I got to 8:36 but I know I can't add another 10 because it'll be too much. I'm going to add a friendly number next. I know 8:36 + 4 minutes will be 8:40. Finally 8:40 + 5 minutes will be 8:45.



Remember we're trying to figure out the elapsed time today, so we want to know how much time has passed.

To figure that out, I'll look at my minutes column to see how much time has passed.

I can skip count this… 10, 20, 30 and 4 more minutes makes 34 minutes, and 5 more minutes brings me to 39 minutes.

I added 39 minutes total which means it took Jordan 39 minutes to walk to school. Our answer is 39 minutes passed.

8:06 + 39 minutes = 8:45

Finally I'm going to write an equation to show my work. I started at 8:06, added 39 minutes and ended with the time 8:45.

We solved a time interval problem where we were trying to find how much time passed. We slowly added more and more time to our start time until we reached our end time. Then we added up all the time to figure out how much time passed in all.

Let's Try It (Slide 7-8): Now let's try some time interval problems together. Remember to use a timeline to help figure out whether we're going forward or backwards in time. That will let us know whether we need to add or subtract minutes.

WARM WELCOME

Today we will solve word problems with time intervals.

Let's Talk:

How long does it last?

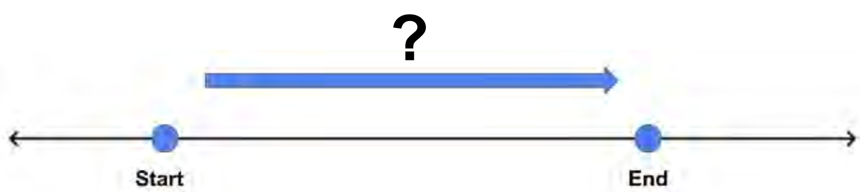
Can you give me some examples of activities you do and how long you think they last?

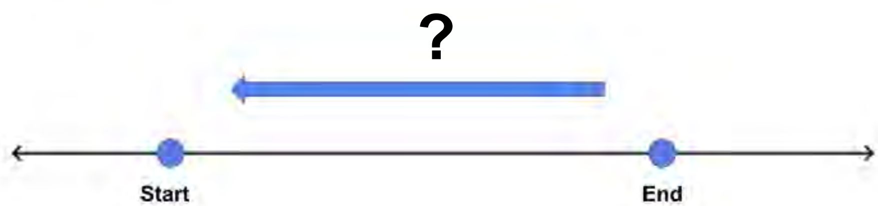
Let's Review:

We added & subtracted minutes to find start and end times.

Let's Talk:

How much time has passed?





Let's Think:

Jordan gets to school every day at 8:45. He leaves the house at 8:06 in the morning. How long does it take him to walk from his house to school?

Let's Try It:

Let's apply our understanding together.

Name: ____________________ G3 U6 6-5 Let's Try It

Directions: Solve each elapsed time using a timeline and t-chart.

1. Mckenzie loves baking cookies. She puts her cookies in the over at 12:24 and takes them out at 12:55. How long did it take for the cookies to bake?

2. Jade usually wakes up at 7:05 in the morning. This morning she slept in and woke up at 7:31. How long did she oversleep this morning?

3. Quincy's baseball practice starts at 3:15 and ends at 3:50. How long did his practice last?

Directions: Solve each elapsed time using a timeline and t-chart.

4. Kim wanted to take a quick nap after school. She went to sleep at 4:15 and woke up at 4:42. How long did Kim nap?

5. Avery loves riding her bike outside. She finished riding her bike at 6:37. She started riding her bike at 6:22. How long did Avery ride her bike for?

6. Robin had a ton of homework to do tonight. She began her homework at 7:22. She finished her homework at 7:59. How long did it take her to finish her homework?

On your Own:

Now it's time to try on your own.

Name: ____________________ G3 U6 6-5 Independent Work

Remember: Solve each elapsed time using a timeline and t-chart.

1. Cecil loves cooking on the grill. He puts the hot dogs, hamburgers and half smokes on at 6:02. He takes them all off at 6:26. How long did it take all the food to cook?

2. Shyril loves to walk around her neighborhood. She begins her walk every night at 5:12 and is done by 5:47. How long do her walks last?

Name: ______________________________________ G3 U6 Lesson 5 - Let's Try It

Directions: Solve each elapsed time using a timeline and t-chart.

1. Mckenzie loves baking cookies. She puts her cookies in the over at 12:24 and takes them out at 12:55. How long did it take for the cookies to bake?

2. Jade usually wakes up at 7:05 in the morning. This morning she slept in and woke up at 7:31. How long did she oversleep this morning?

3. Quincy's baseball practice starts at 3:15 and ends at 3:50. How long did his practice last?

Directions: Solve each elapsed time using a timeline and t-chart.

4. Kim wanted to take a quick nap after school. She went to sleep at 4:15 and woke up at 4:42. How long did Kim nap?

5. Avery loves riding her bike outside. She finished riding her bike at 6:37. She started riding her bike at 6:22. How long did Avery ride her bike for?

6. Robin had a ton of homework to do tonight. She began her homework at 7:22. She finished her homework at 7:59. How long did it take her to finish her homework?

Remember: Solve each elapsed time using a timeline and t-chart.

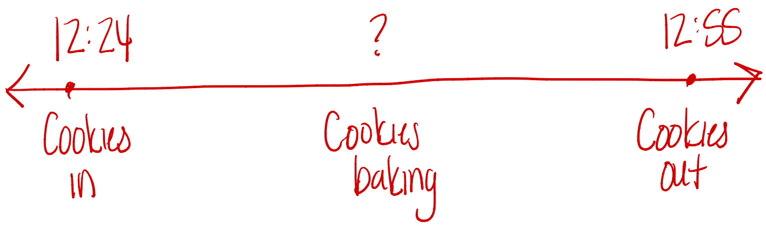
1. Cecil loves cooking on the grill. He puts the hot dogs, hamburgers and half smokes on at 6:02. He takes them all off at 6:28. How long did it take all the food to cook?

2. Shyril loves to walk around her neighborhood. She begins her walk every night at 5:12 and is done by 5:47. How long do her walks last?

Name: ______________________________________

Directions: Solve each elapsed time using a timeline and t-chart.

1. Mckenzie loves baking cookies. She puts her cookies in the over at 12:24 and takes them out at 12:55. How long did it take for the cookies to bake?

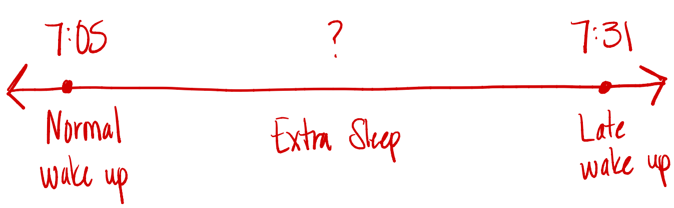


time	minutes
12:24	+10
12:34	+10
12:44	+10
12:54	+1
12:55	

31

12:24 + 31 minutes = 12:55

2. Jade usually wakes up at 7:05 in the morning. This morning she slept in and woke up at 7:31. How long did she oversleep this morning?

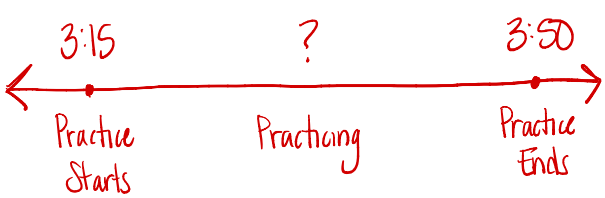


time	minutes
7:05	+10
7:15	+10
7:25	+5
7:30	+1
7:31	

26

7:05 + 26 minutes = 7:31

3. Quincy's baseball practice starts at 3:15 and ends at 3:50. How long did his practice last?



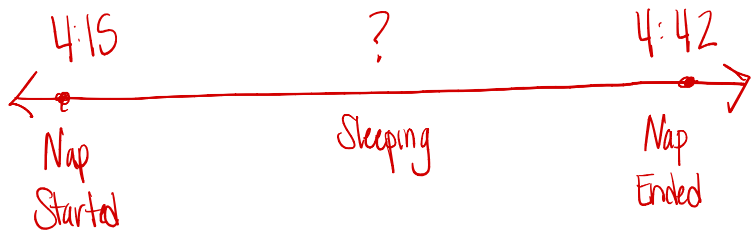
time	minutes
3:15	+10
3:25	+10
3:35	+10
3:45	+5
3:50	

35

3:15 + 35 minutes = 3:50

Directions: Solve each elapsed time using a timeline and t-chart.

4. Kim wanted to take a quick nap after school. She went to sleep at 4:15 and woke up at 4:42. How long did Kim nap?

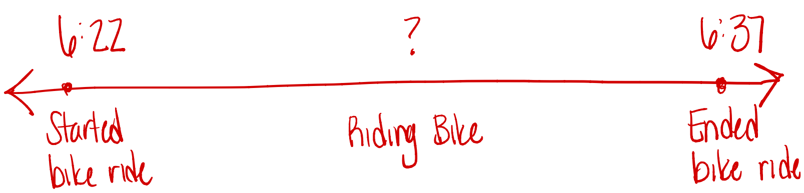


time	minutes
4:15	+10
4:25	+10
4:35	+5
4:40	+2
4:42	

27

4:15 + 27 minutes = 4:42

5. Avery loves riding her bike outside. She finished riding her bike at 6:37. She started riding her bike at 6:22. How long did Avery ride her bike for?

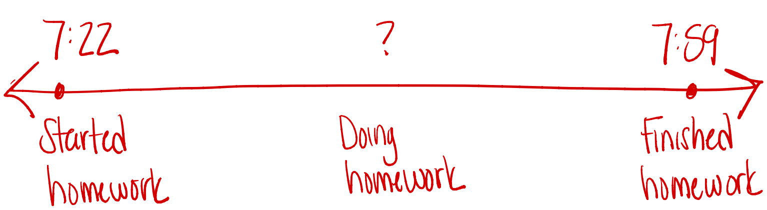


time	minutes
6:22	+10
6:32	+5
6:37	

15

6:22 + 15 minutes = 6:37

6. Robin had a ton of homework to do tonight. She began her homework at 7:22. She finished her homework at 7:59. How long did it take her to finish her homework?



time	minutes
7:22	+10
7:32	+10
7:42	+10
7:52	+7
7:59	

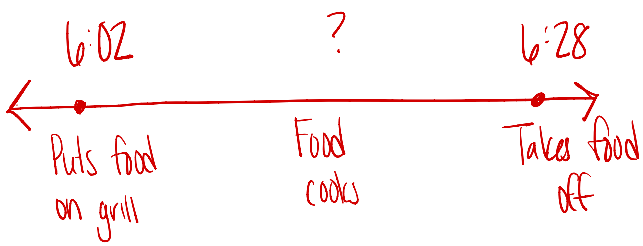
37

7:22 + 37 minutes = 7:59

Name: ___________________________________ G3 U6 Lesson 5 - Independent Work

Remember: Solve each elapsed time using a timeline and t-chart.

1. Cecil loves cooking on the grill. He puts the hot dogs, hamburgers and half smokes on at 6:02. He takes them all off at 6:28. How long did it take all the food to cook?

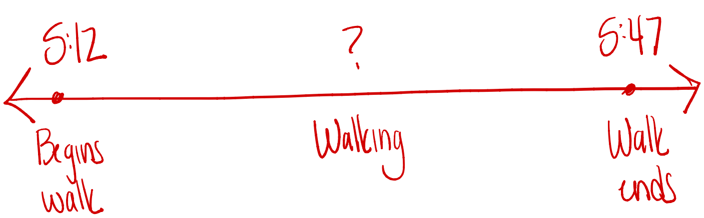


time	minutes
6:02	
6:12	+10
6:22	+10
6:28	+6

26

6:02 + 26 minutes = 6:28

2. Shyril loves to walk around her neighborhood. She begins her walk every night at 5:12 and is done by 5:47. How long do her walks last?



time	minutes
5:12	
5:22	+10
5:32	+10
5:42	+10
5:47	+5

35

5:12 + 35 minutes = 5:47