CITYTUTOR

Third Grade Math Lesson Materials

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Identification of the copyrighted work claimed to have been infringed, or, if multiple copyrighted works allegedly have been infringed, then a representative list of such copyrighted works;

Identification of the material that is claimed to be infringing and that is to be removed or access to which is to be disabled, and information reasonably sufficient to permit us to locate the allegedly infringing material, e.g., the specific web page address on the Platform;

Information reasonably sufficient to permit us to contact the party alleging infringement, including an email address;

A statement that the party alleging infringement has a good-faith belief that use of the copyrighted work in the manner complained of is not authorized by the copyright owner or its agent, or is not otherwise permitted under the law; and

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CITYTUTOR DC

G3 Unit 3:

Finding Area

G3 U3 Lesson 1

Explore the area of rectangles using square tiles

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.)*

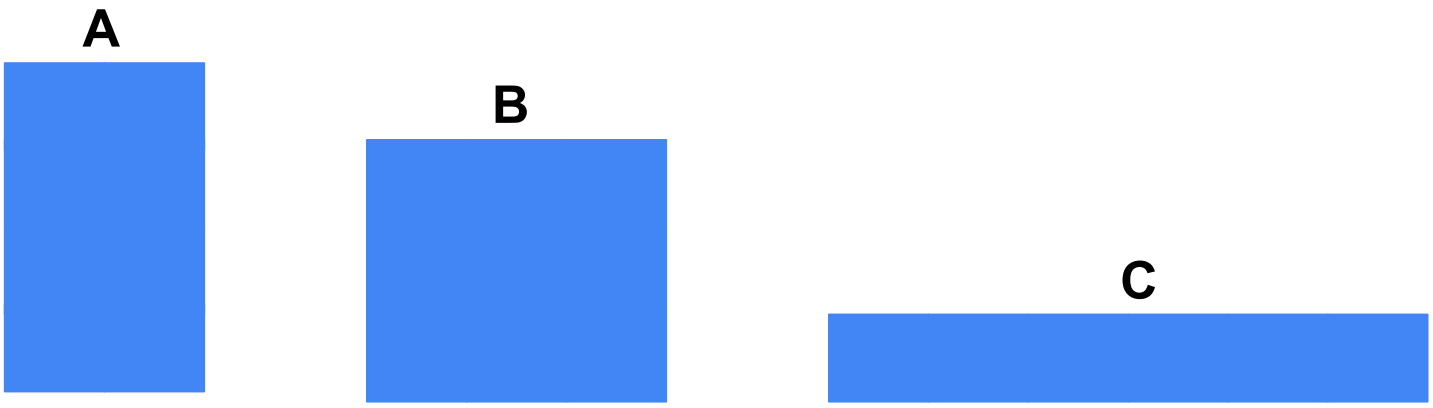
Let's Try it (Slides 14-15): Now let's solve problems about the area of rectangles using tiles. We are going to work on the first page step-by-step. Remember when we are finding the area we are finding what? Area is the amount of space a flat shape takes up. There can be no gaps and no overlaps!

WARM WELCOME

Today we will explore the **area** of rectangles using square tiles.

Let's Talk:

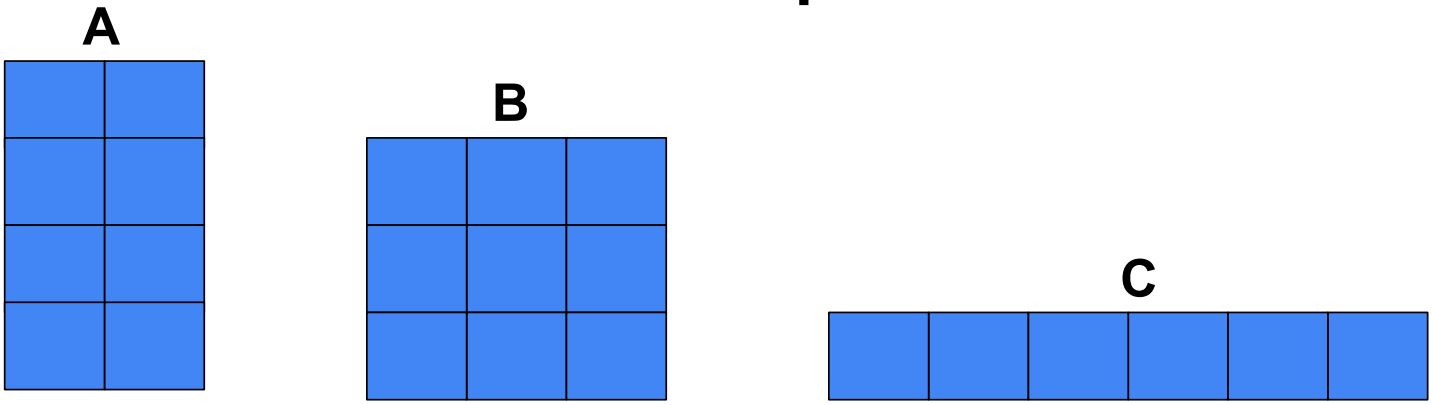
Which shape is the biggest and what makes you think that?



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.



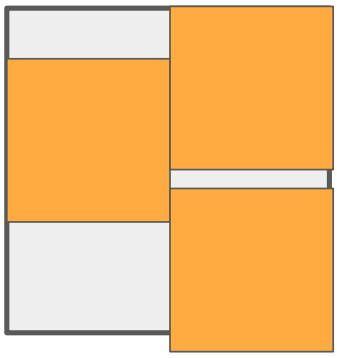

Let's Think:

How do you find the area of a rectangle?

You fill in the rectangle with square tiles.

Let's Think:

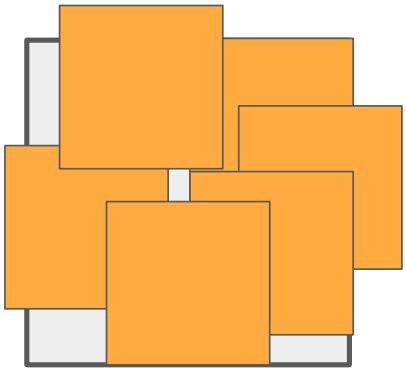
When finding the area, leave <u>no gaps!</u>



area = **3** square inches

Let's Think:

When finding the area, have <u>no overlaps!</u>



area = **6** square inches

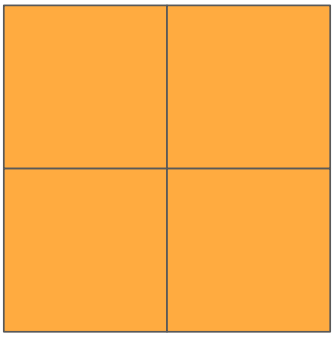
Let's Think:

What is the area of this figure?

area = _____ square inches

Let's Think:

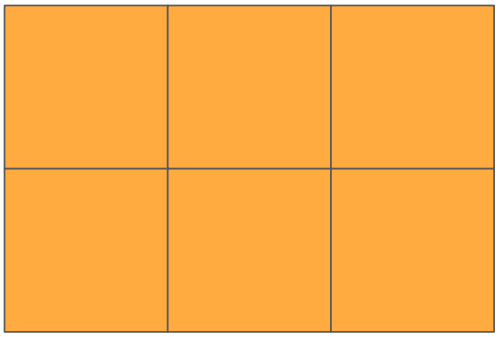
What is the area of this square?



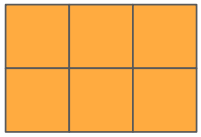
area = _____ square inches

Let's Think:

What do you notice?



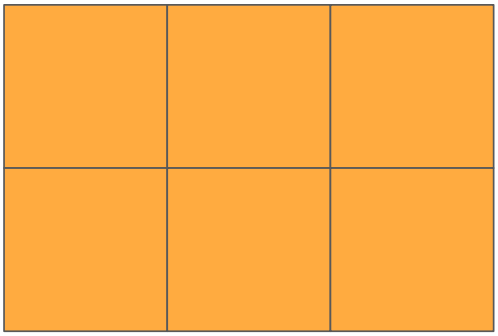
area = 6 square inches



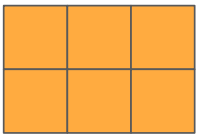
area = 6 square centimeters

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 inches



area = 6 square centimeters

Let's Think:

What <u>units</u> do we use when finding the area?

square units (sq un)

square inches (sq in)

square centimeters (sq cm)

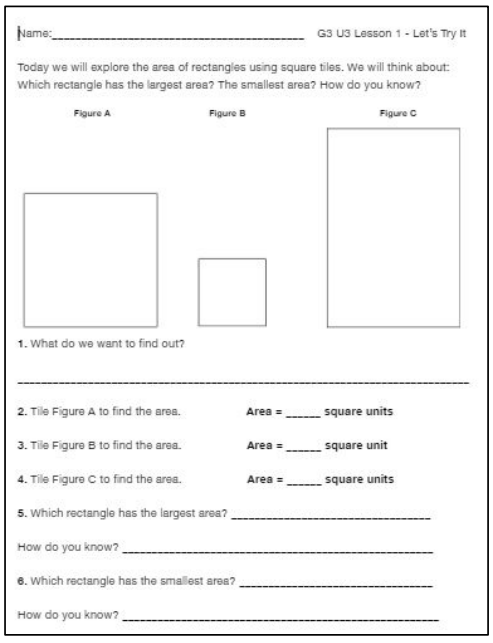
square feet (sq ft)

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

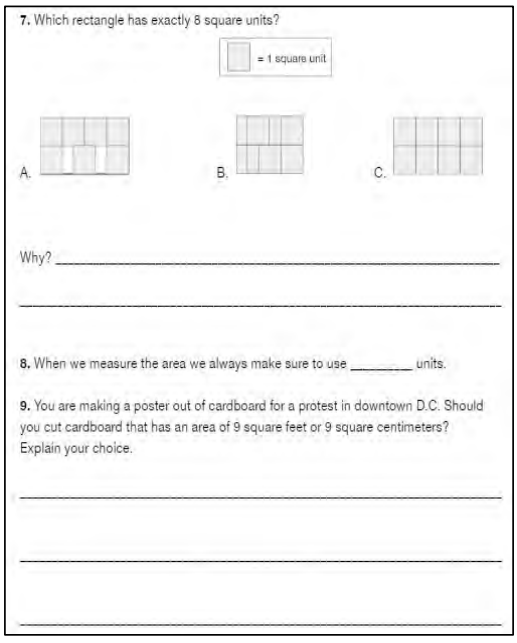
4. Tile Figure C to find the area. Area = _____ square units

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.

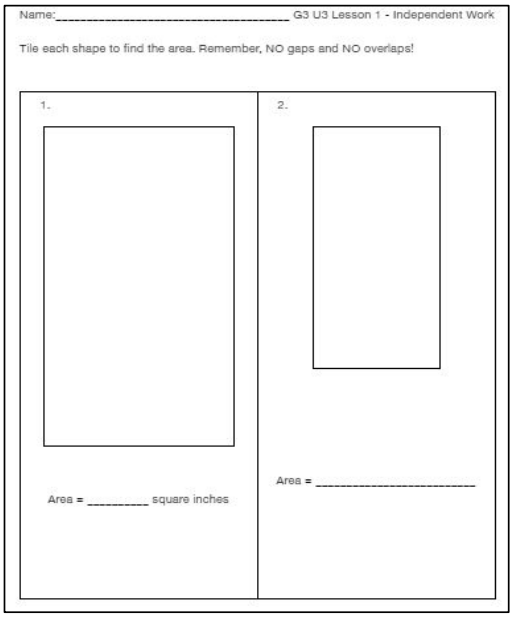
_____

_____

_____

On your Own:

Now you can find the area of rectangles using tiles on your own!



Name:_____ G3 U3 Lesson 1 - Independent Work

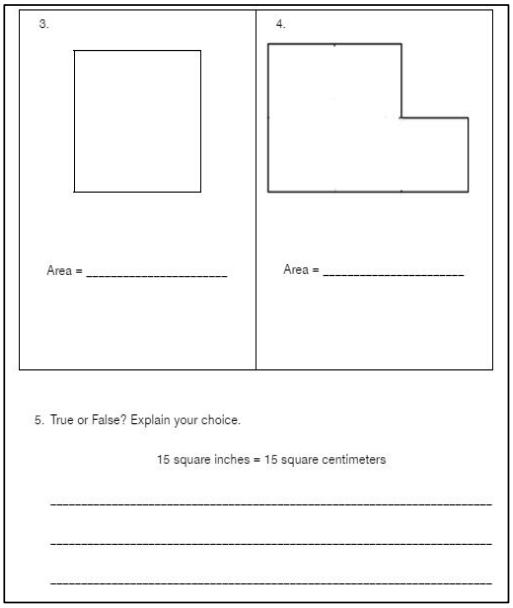
Tile each shape to find the area. Remember, NO gaps and NO overlaps!

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

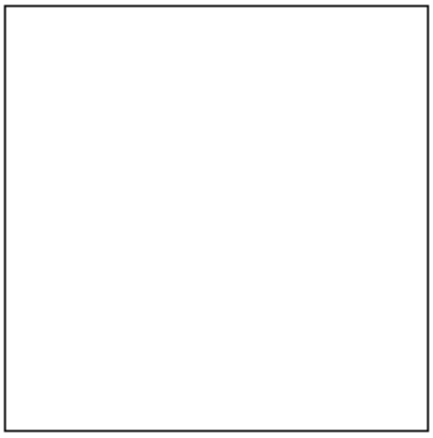


Figure B

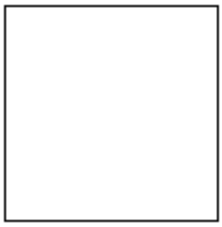
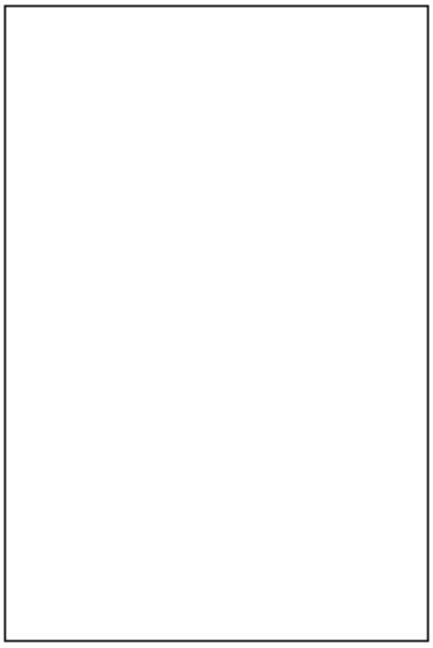


Figure C



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**

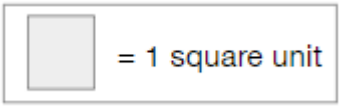
5. Which rectangle has the largest area? _____

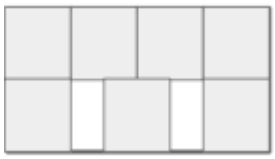
How do you know? _____

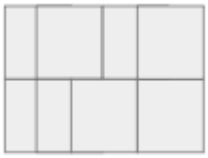
6. Which rectangle has the smallest area? _____

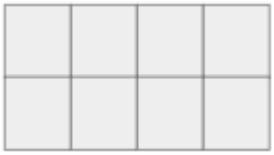
How do you know? _____

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.

_____

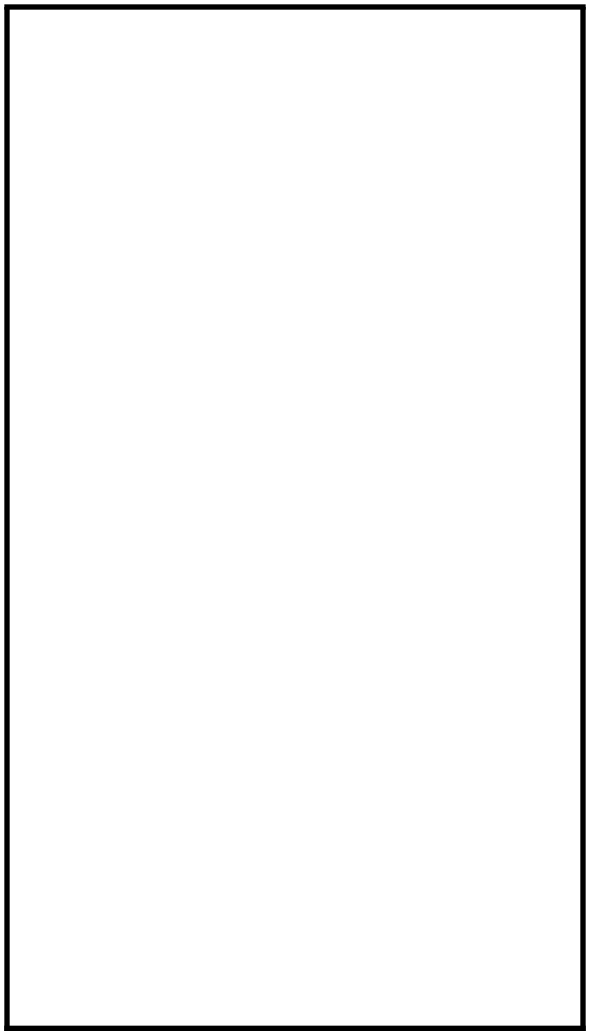
_____

_____

Name:_____ G3 U3 Lesson 1 - Independent Work

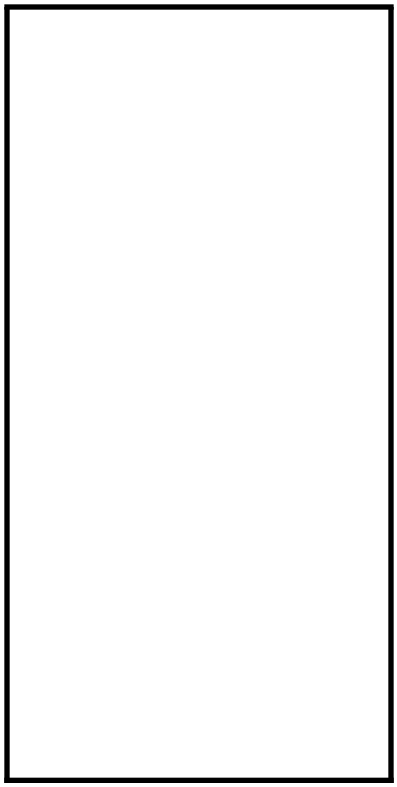
Tile each shape to find the area. Remember, NO gaps and NO overlaps!

1.



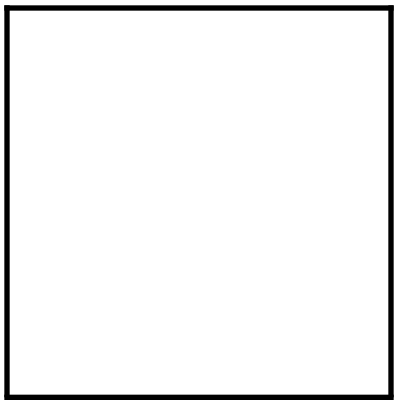
Area = _____ square inches

2.



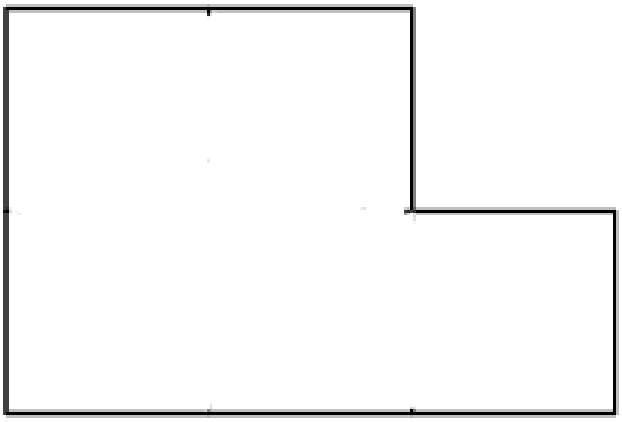
Area = _____ square inches

3.



Area = _____ square inches

4.



Area = _____ square inches

5. True or False? Explain your choice.

15 square inches = 15 square centimeters

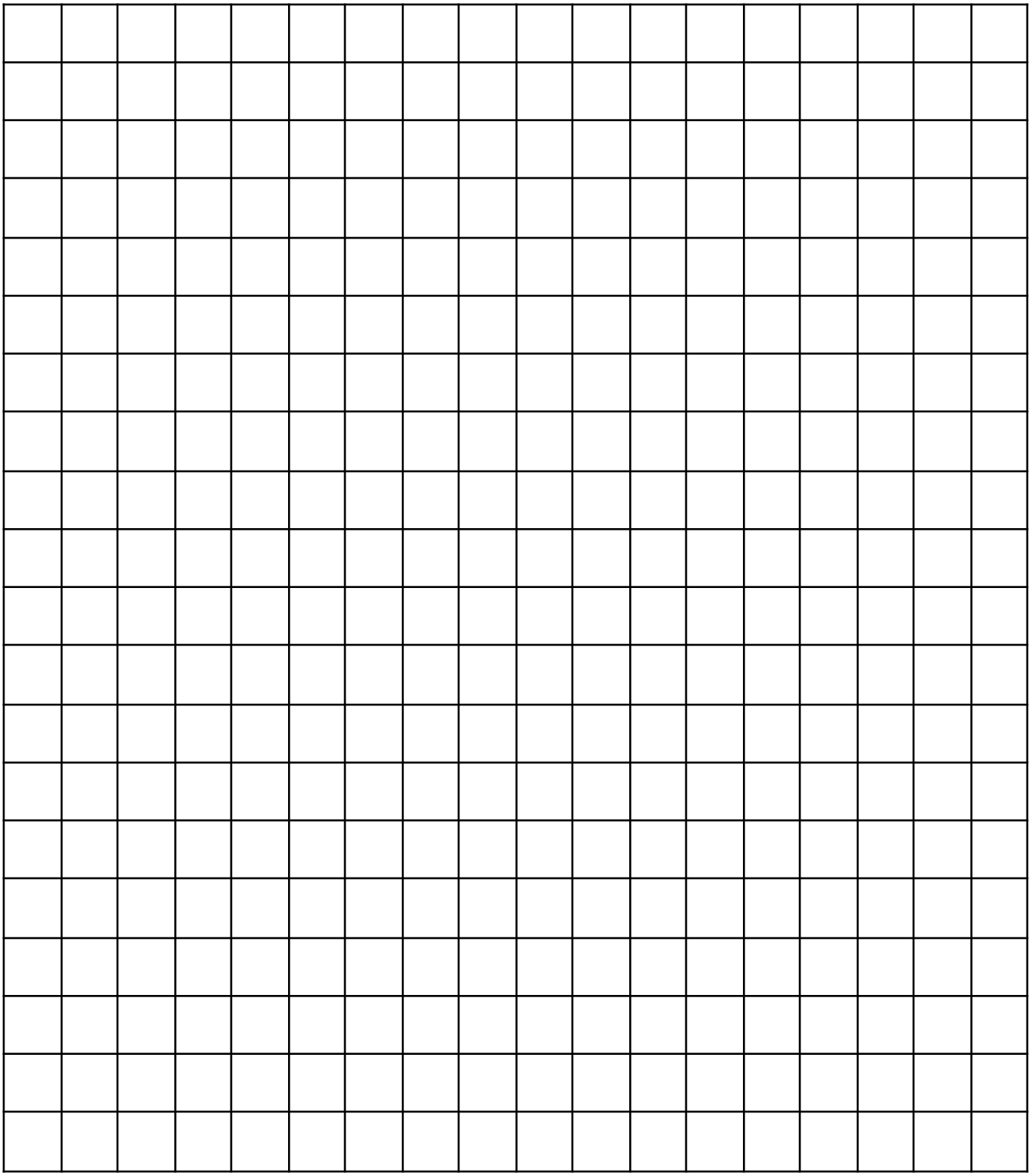
_____

_____

_____

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?

Figure A

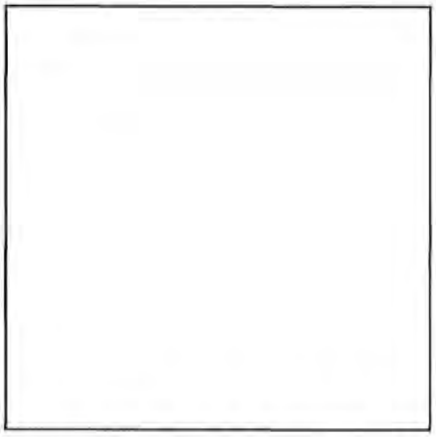


Figure B

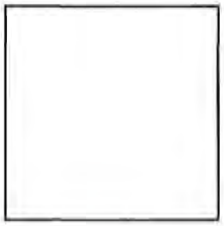
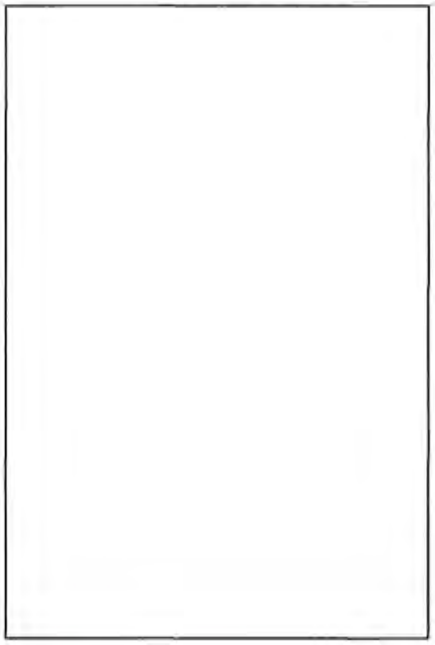


Figure C



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**

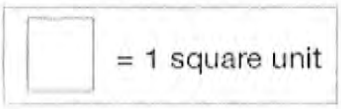
5. Which rectangle has the largest area? Figure C

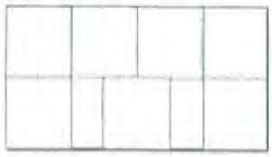
How do you know? 6 is the biggest number.

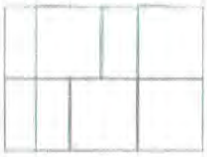
6. Which rectangle has the smallest area? Figure B

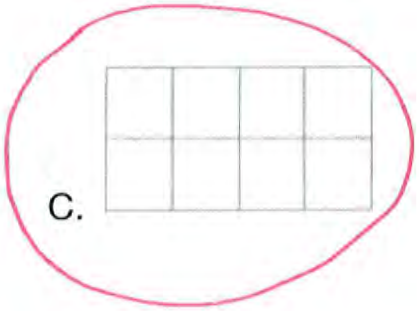
How do you know? It only has 1 square

7. Which rectangle has exactly 8 square units?



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.

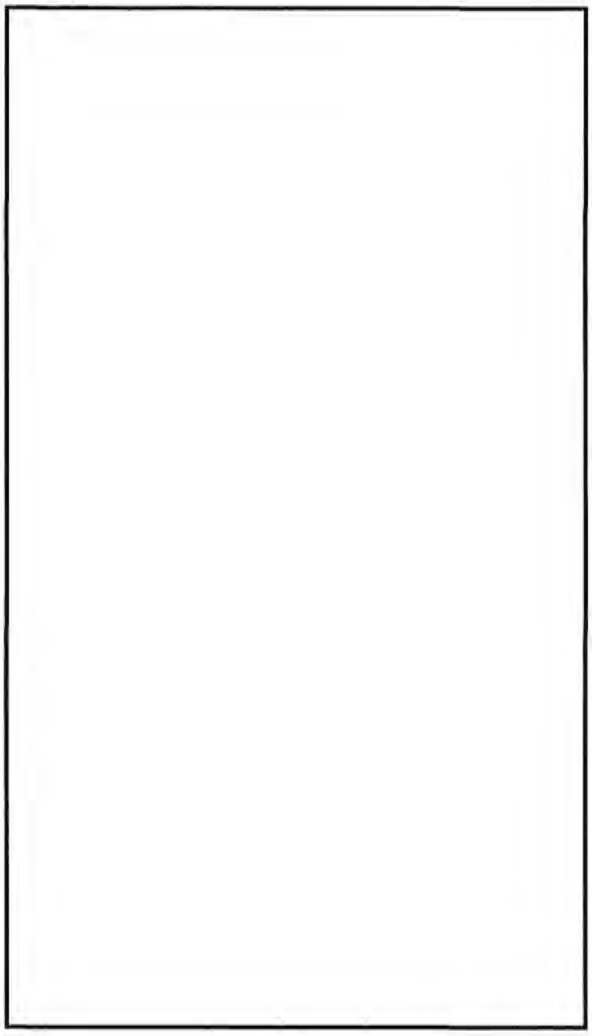
9. You are making a poster out of cardboard for a protest in downtown D.C. Should you cut cardboard that has an area of 9 square feet or 9 square centimeters? Explain your choice.

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

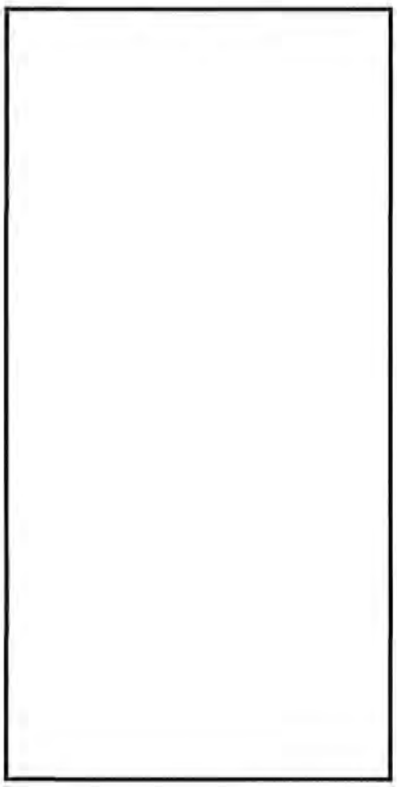
Tile each shape to find the area. Remember, NO gaps and NO overlaps!

1.



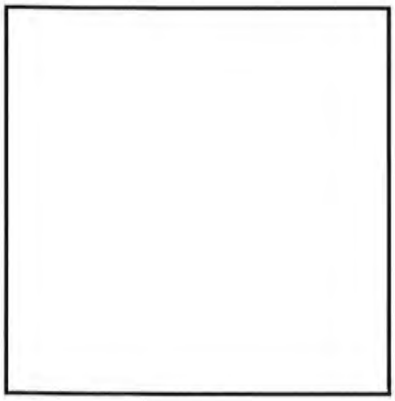
Area = 15 square inches

2.



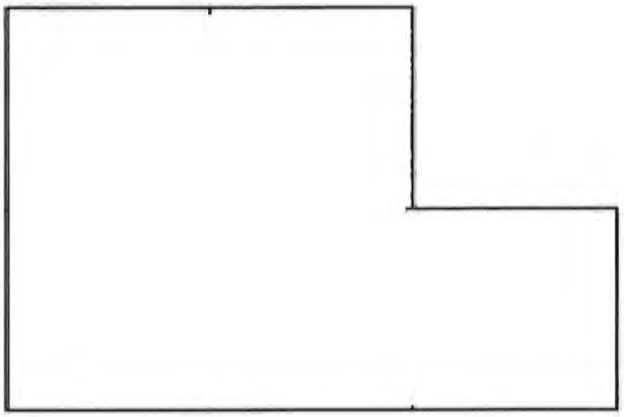
Area = 8 sq in

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.

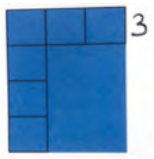
Frame the Learning/Connect to Prior Learning (Slide 4): Today, we will learn the second way to measure the area of rectangles and squares. Today we will explore how we can use what we know about equal groups and skip counting to find area. Today we'll be looking carefully at rows to help us calculate 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*).

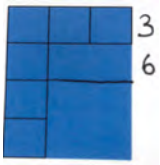
This is important because sometimes you're going to see a rectangle like this! Whoa, look at this rectangle (*point to the second rectangle)*. What is different about it? We can't see all the tiles. Some of the tiles were erased! When we don't have all the tiles filled in so we can't count all the tiles, 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.

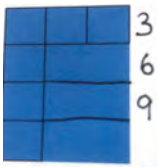
Even though some of the square tiles are missing, we see that we have 4 rows of 3 units. Say it with me: 4 rows of 3 units. Who can slide their finger across each row? (*Have student slide finger across each row and they say, "1 row, 2 rows, 3 rows, 4 rows").* Who can point to how many in each row? (*Have student point to 3 tiles in one row).* Finally you skip count to calculate the area.



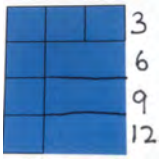
We will skip count by three four times. The first row has 3.



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!

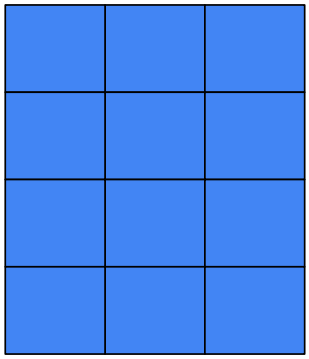
WARM WELCOME

Let's Review:

AREA is the amount of space a flat shape (two-dimensional shape) takes up.

Let's Review:

To find the area of a rectangle, we can count the square tiles.

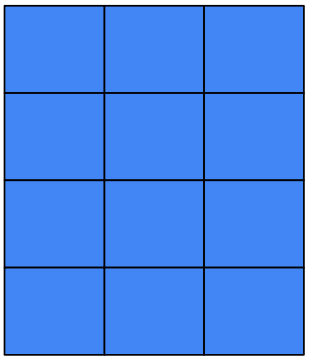


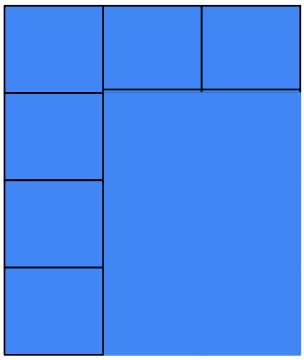
Remember, there must be no gaps and no overlaps!

Today we will measure the **area** of a rectangle by using equal groups and skip counting.

Let's Talk:

What are some other ways we can find the area?



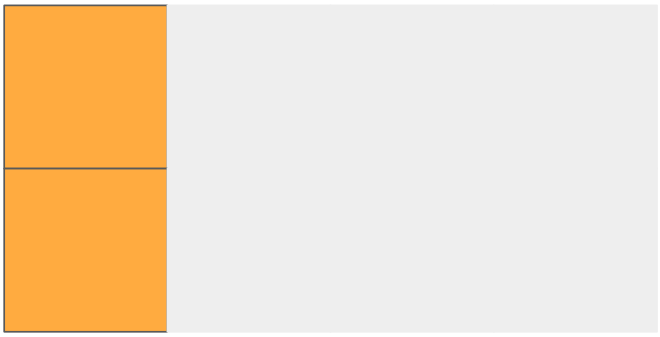


Let's Think:

How many rows are in this rectangle?

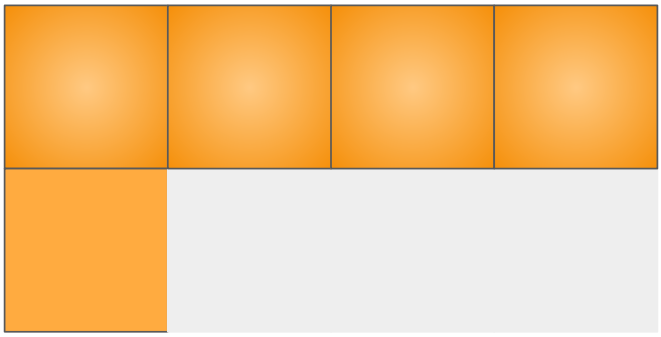
Let's Think:

How many rows are in this rectangle?



Let's Think:

How many tiles in each row?



Let's Think:

Review from yesterday

square units (sq un)

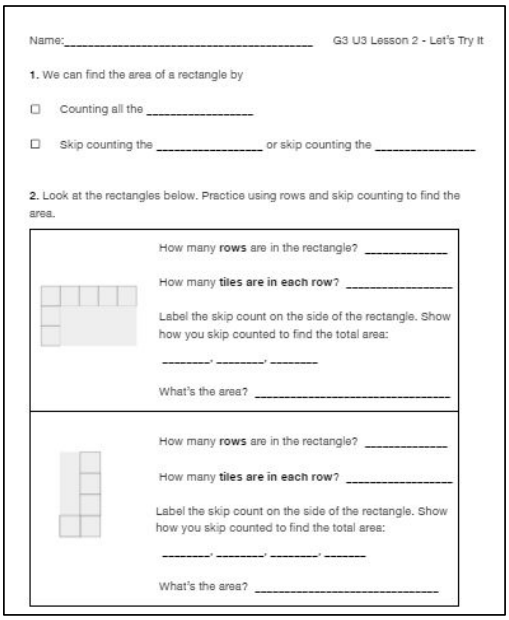
square inches (sq in)

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? _____

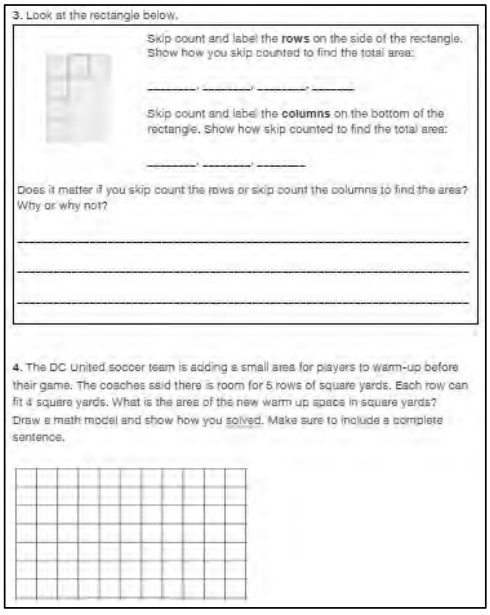
How many **rows** are in the rectangle? _____

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: _____, _____.

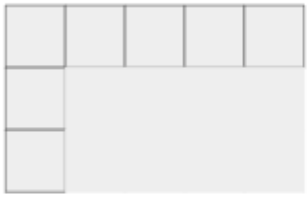
What's the area? _____

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.



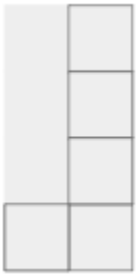
How many **rows** are in the rectangle? _____

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? _____

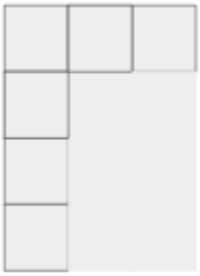
How many **tiles are in each row**? _____

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:

_____, _____, _____

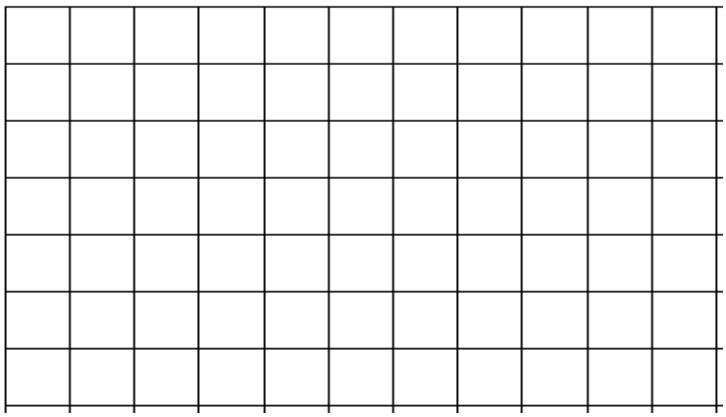
Does it matter if you skip count the rows or skip count the columns to find the area? Why or why not?

_____

_____

_____

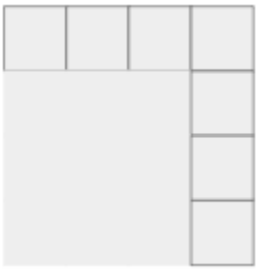
4. The DC United soccer team is adding a small area for players to warm-up before their game. The coaches said there is room for 5 rows of square yards. Each row can fit 4 square yards. What is the area of the new warm up space in square yards? Draw a math model and show how you solved. Make sure to 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? _____

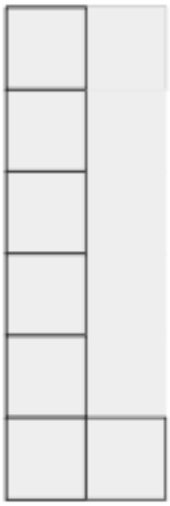
How many **tiles are in each row**? _____

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:_____ G3 U3 Lesson 2 - 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

2. Look at the rectangles below. Practice using rows and skip counting to find the area.

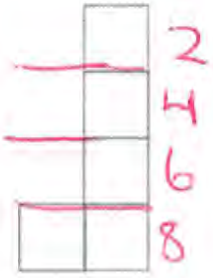
How many **rows** are in the rectangle? 3 rows

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

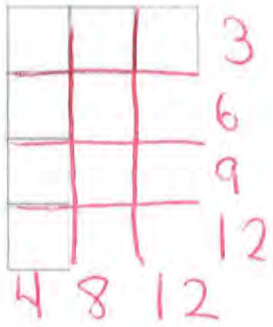
How many **tiles are in each row**? 2 tiles

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

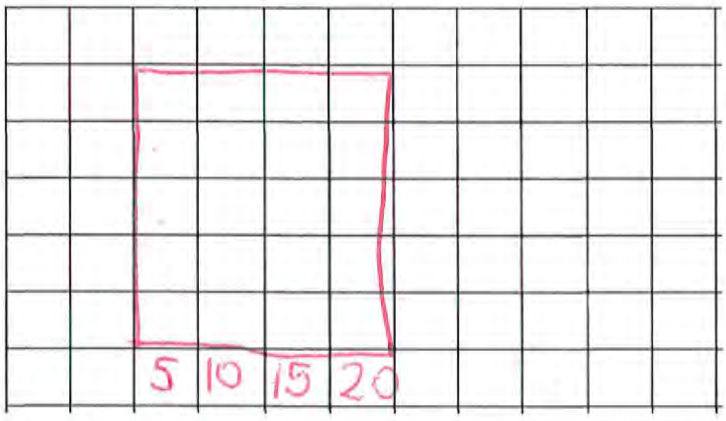
Skip count and label the **columns** on the bottom of the rectangle. Show how skip counted to find the total area:

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.



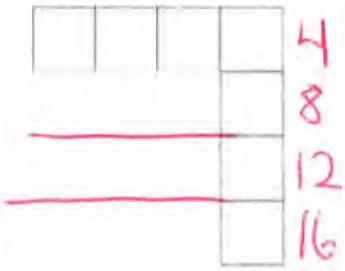
The area of the new space is 20 square yards.

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

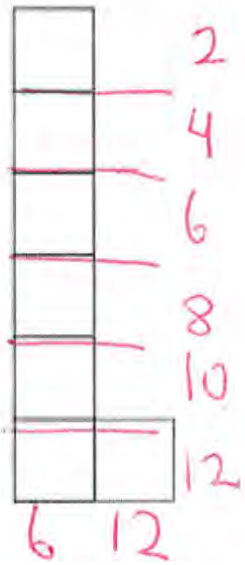
How many **tiles are in each row**? 4 tiles

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

Notes 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

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!

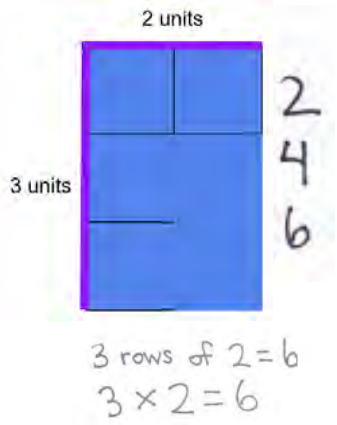
Could we multiply 2 units x 2 units to find the area of this shape? (*Point to the two parallel sides)* No! That doesn't show us how many rows AND how many are in each row. When we multiply the side lengths, we need to make sure we're multiplying the number of rows by the number of columns *(point to 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.

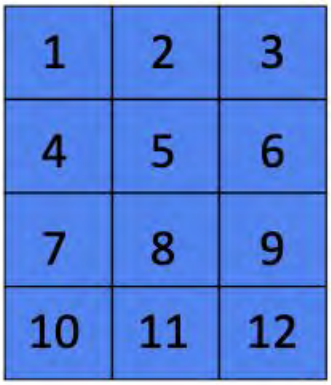
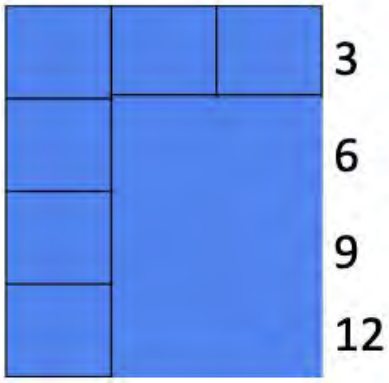
WARM WELCOME

Let's Review:

AREA is the amount of space a flat shape (two-dimensional shape) takes up.

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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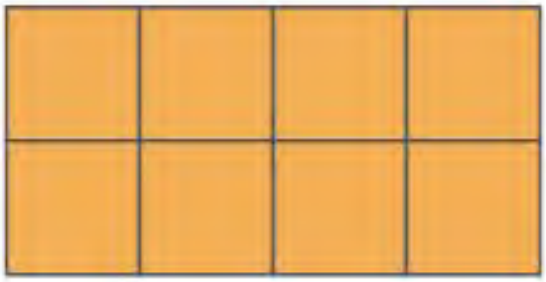
Let's Talk:

What are some ways we can describe this rectangle?

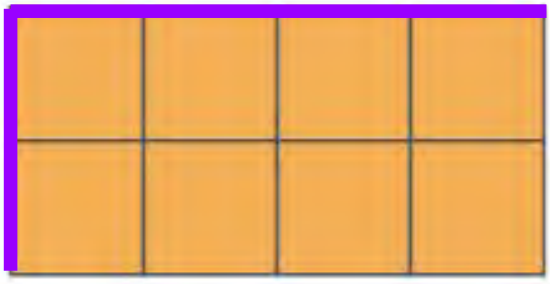


Let's Think:

Let's measure the side lengths.

_____ units

_____ units

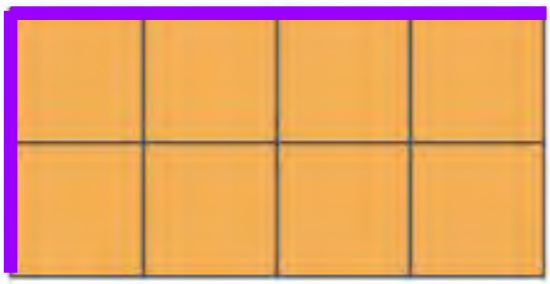


Let's Think:

Let's multiply to find area.

_____ units

_____ units



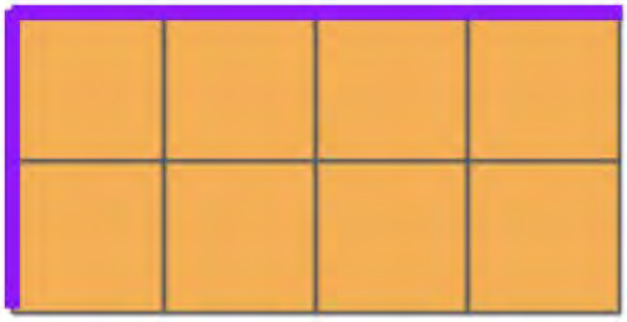
_____ X _____ = _____ square units

Let's Think:

What is the relationship between the side lengths and the number of tiles on a side?

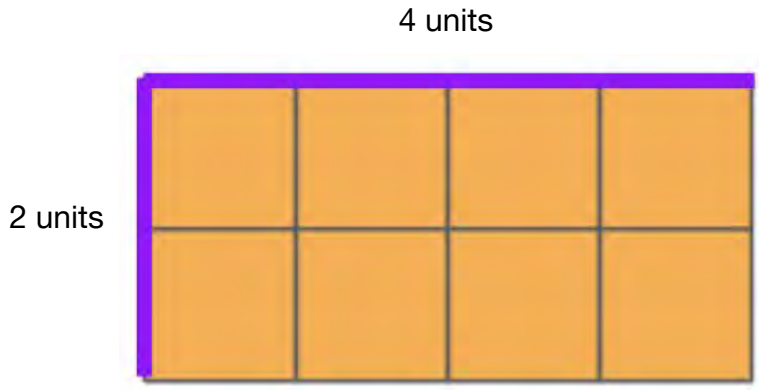
4 units

2 units



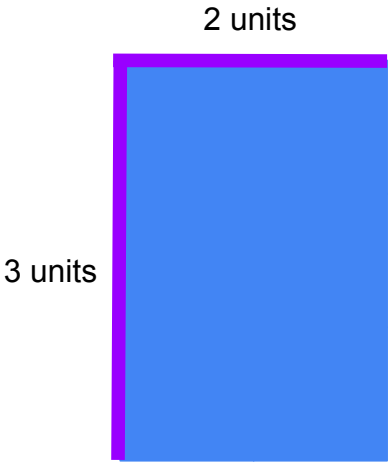
Let's Think:

Let's explore why it makes sense that we can multiply the side lengths to find the area.



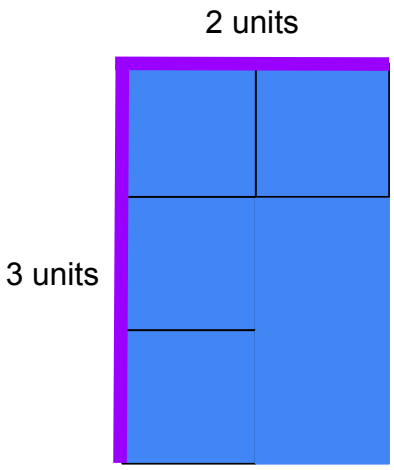
Let's Think:

Let's multiply side lengths to find the area!



Let's Think:

Let's multiply side lengths to find the area!



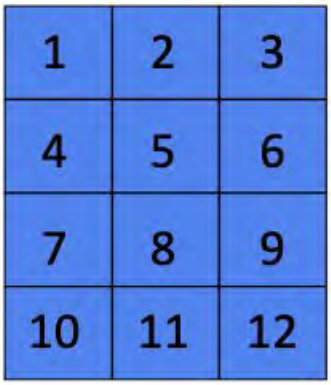
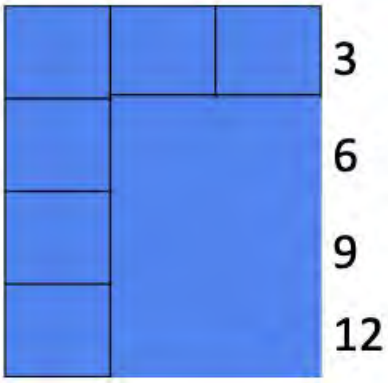
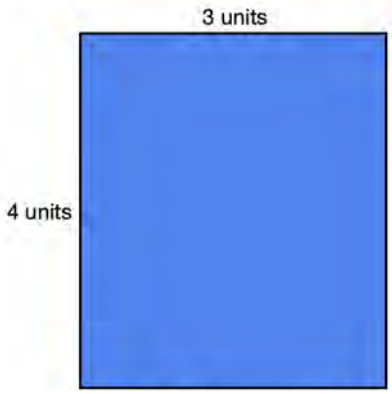
Let's Think:

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)

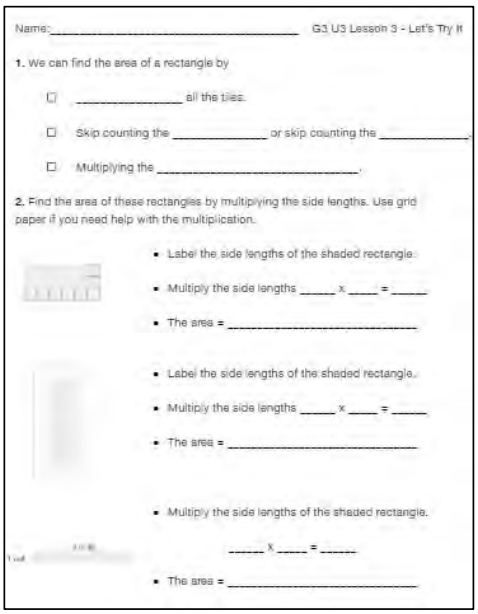
Let's Review:

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.

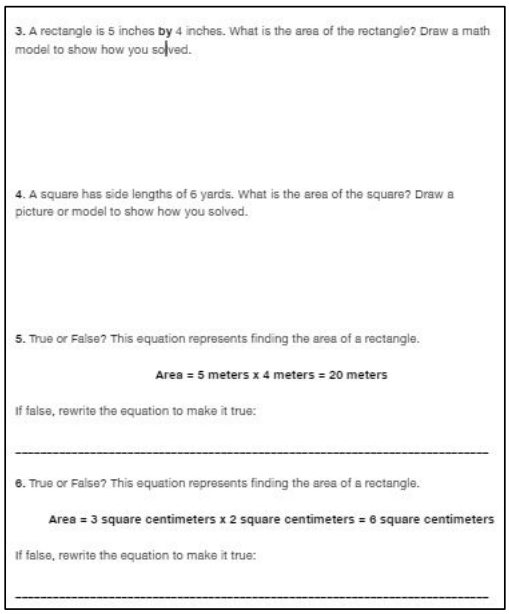
- Label the side lengths of the shaded rectangle.
- Multiply the side lengths _____ x _____ = _____
- The area = _____

- 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 _____ = _____

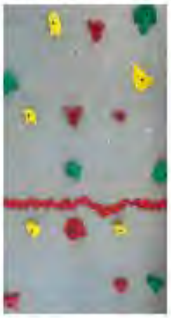
area = _____

___ 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

Name:_____ G3 U3 Lesson 3 - Let's Try It

1. We can find the area of a rectangle by…

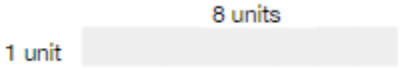
- ☐ _____ all the tiles.
- ☐ Skip counting the _____ or skip counting the _____.
- ☐ Multiplying the _____.
- ☐

---

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 _____ 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

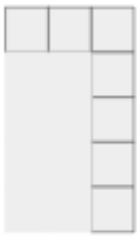
If false, rewrite the equation to make it true: _____

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.

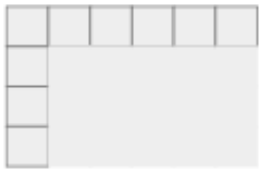


____ rows of ____

_____ x _____ = _____

area = _____

2.

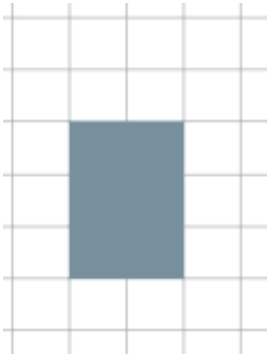


____ rows of ____

_____ x _____ = _____

area = _____

3.

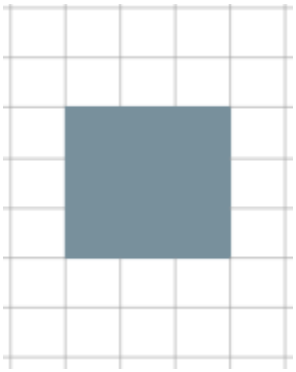


____ rows of ____

_____ 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

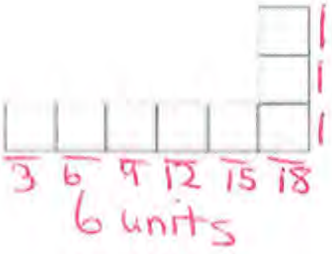
D. 4 ft by 9 feet

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

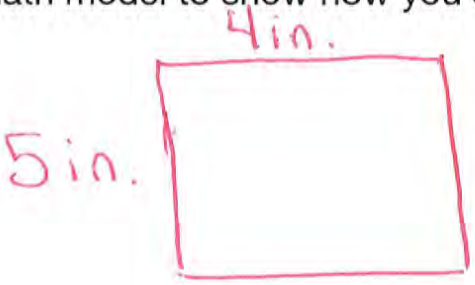
Note: They might need support using the grid paper to help them find the side lengths.

- Multiply the side lengths of the shaded rectangle.

1 x 8 = 8

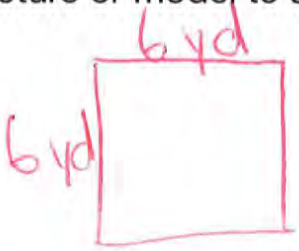
- The area = 8 sq un

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 x 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 x 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!

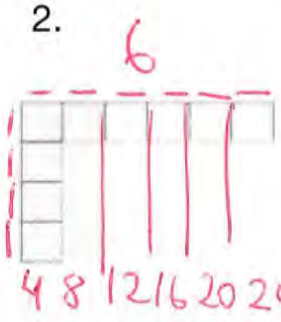
1.

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

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.

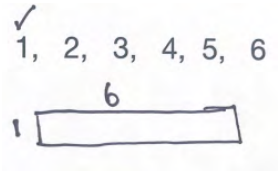
Let's share some of the rectangles we found that have an area of 6 square inches. Tell us the side lengths of the rectangle. You can say, "The area of a rectangle with 6 square inches can have a side length of _____ inches and a side length of _____ inches." *(Call on students to share. Make sure they 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

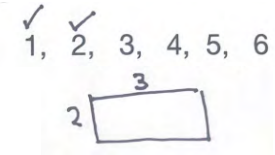
they all have the same side lengths? No! Let's label the side lengths. (*Label the side lengths, reinforcing how to count and label).*

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!

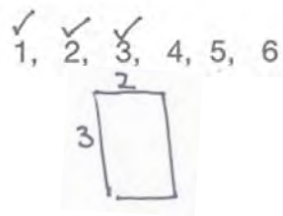
Let's Think (Slide 8): One way to find all the combinations is by moving the tiles around and making rectangles, like we just did. Another way is to skip count whole numbers and see if they go into the area evenly. Whole numbers are any of the numbers you say when you count by 1s starting at 0. Soon in third grade you will learn about fractions, which aren't whole numbers. But for now, let's focus on whole numbers.



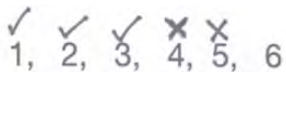
If I want to find all the rectangles that have an area of 6 square units, I can always start with 1 row of 6.



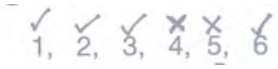
Now let's go in order and see if 2 is a factor of 6. Let's skip count by 2s together: 2, 4, 6. Yes, 2 goes into 6 evenly. It goes in how many times*? 3 times!* Yes because I skip count by 2s 3 times to get six. So I could draw a rectangle with side lengths of 2 and 3. I can imagine 2 rows of 3 tiles.



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.

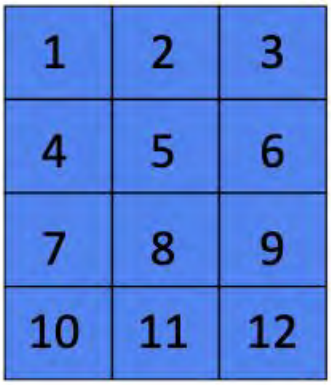
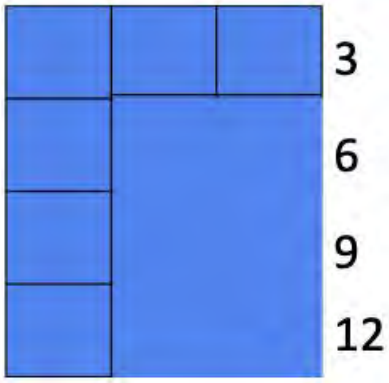
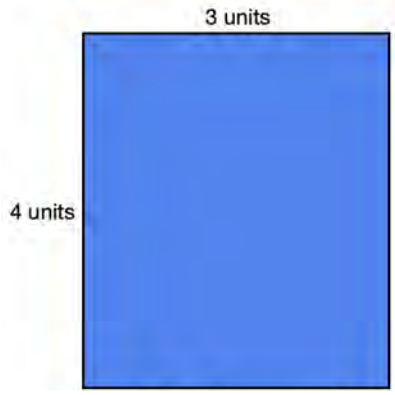
WARM WELCOME

Let's Review:

AREA is the amount of space a flat shape (two-dimensional shape) takes up.

Let's Review:

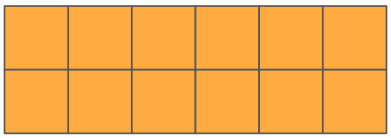
How can we find the area of a rectangle?

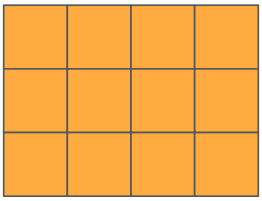
We can fill the inside and **count all** the square tiles.	We can **skip count** the equal groups.	We can **multiply** the side lengths.
		 **4 x 3 = 12 square units**

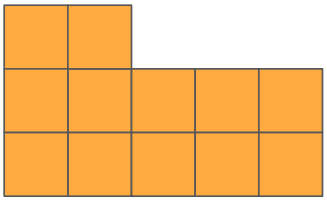
Today we will **decompose** and **recompose** rectangles to **compare areas.**

Let's Talk:

What do you notice?







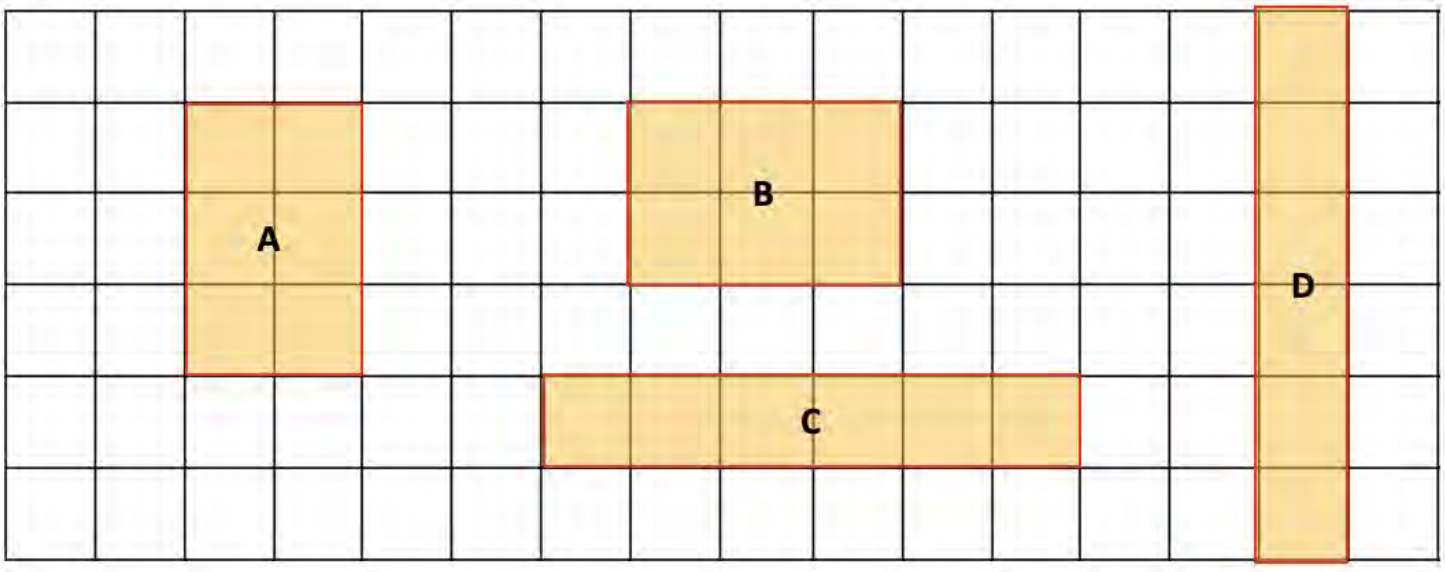
Let's Think:

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!

Let's Think:

Using the square inch tiles, there are four rectangles that have an area of 6 square units.



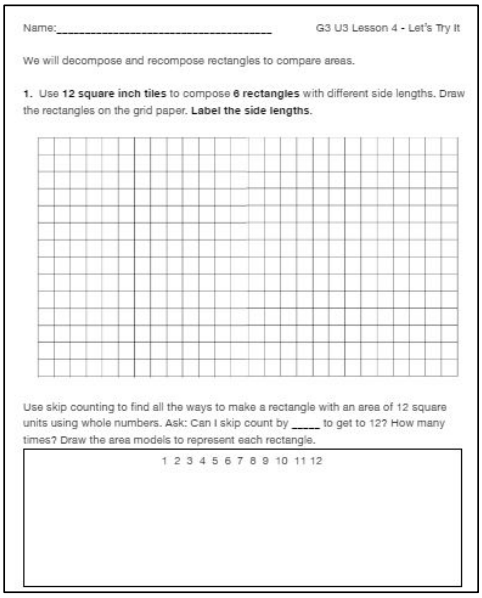
Let's Think:

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.



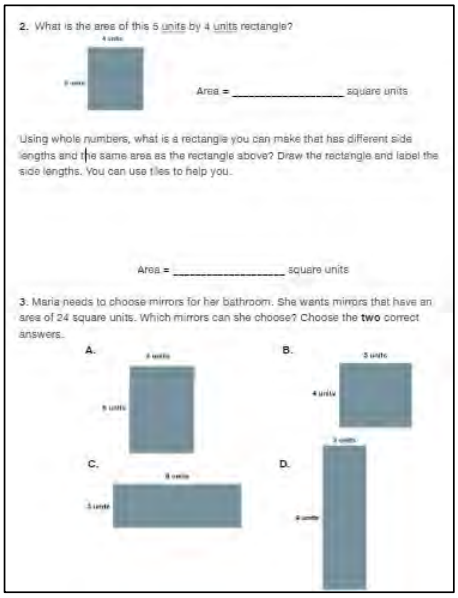
Name:_____ G3 U3 Lesson 4 - Let's Try It

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.

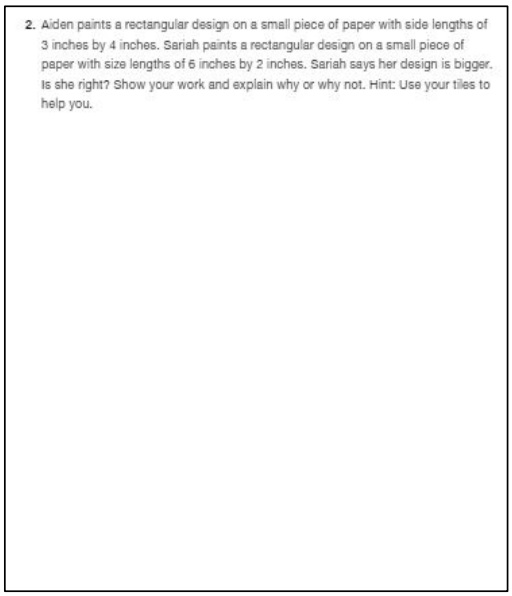
On your Own:

Now you can explore comparing areas of rectangles on your own!

Name:_____ G3 U3 Lesson 4 - Independent Work

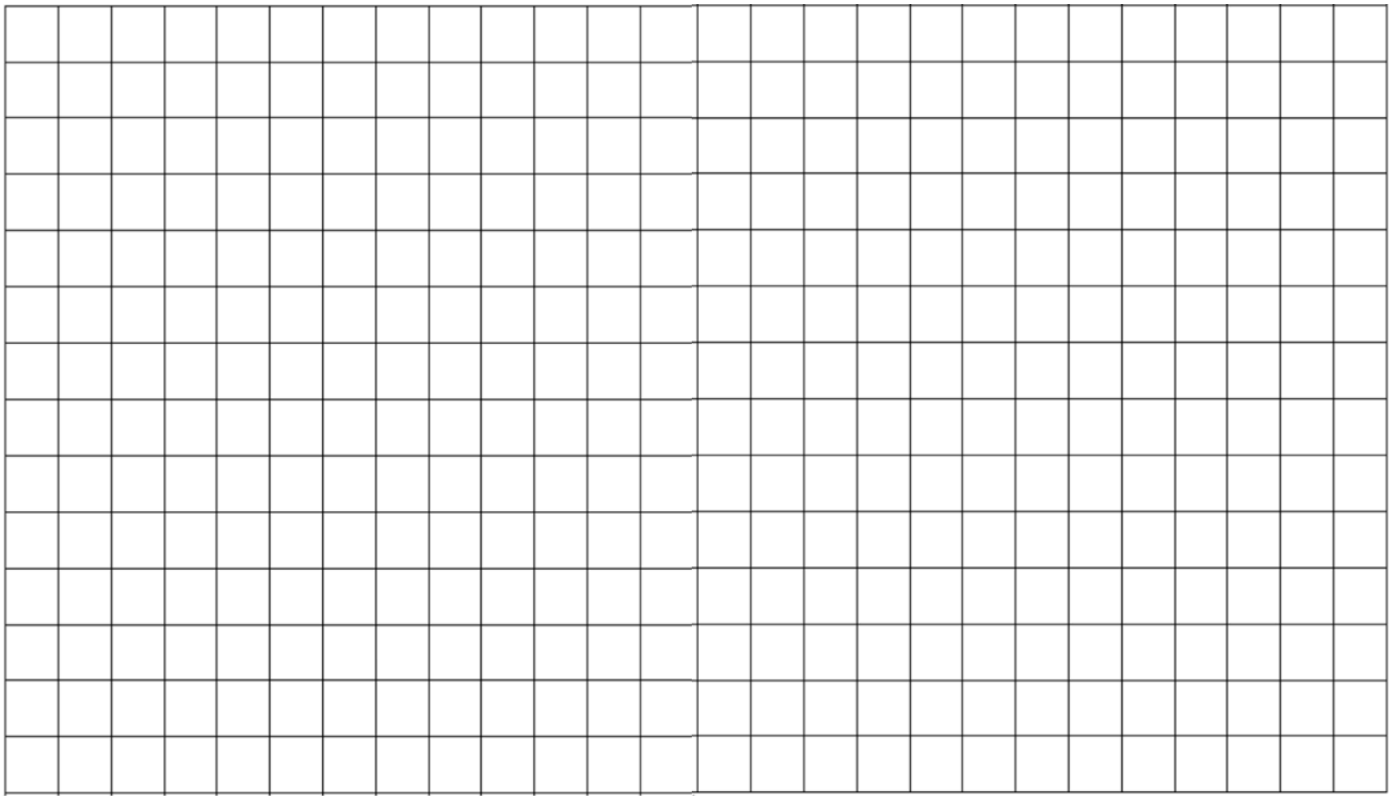
I will decompose and recompose rectangles to compare areas.

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.

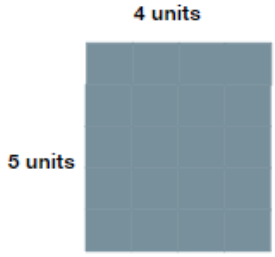
1. Use **12 square inch tiles** to compose **6 rectangles** with different side lengths. Draw the rectangles on the grid paper. **Label the side lengths**.



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?



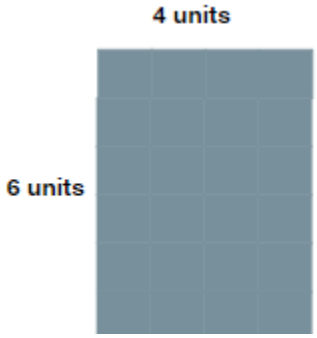
Area = _____ square units

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.

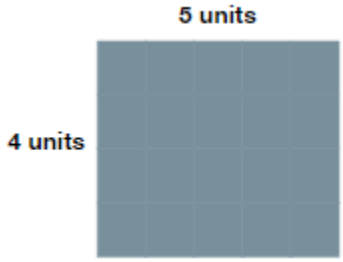
Area = _____ square units

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.

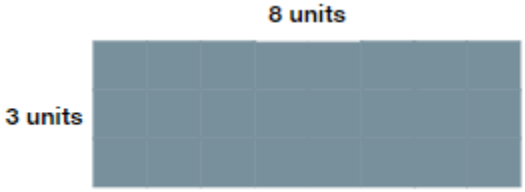
A.



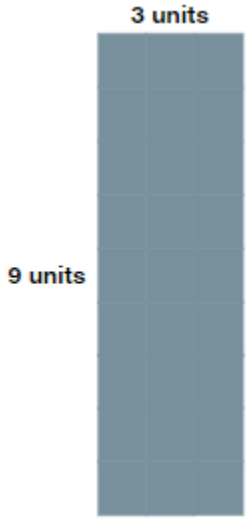
B.



C.



D.



Which mirror has the largest area? _____

Which mirror has the smallest area? _____

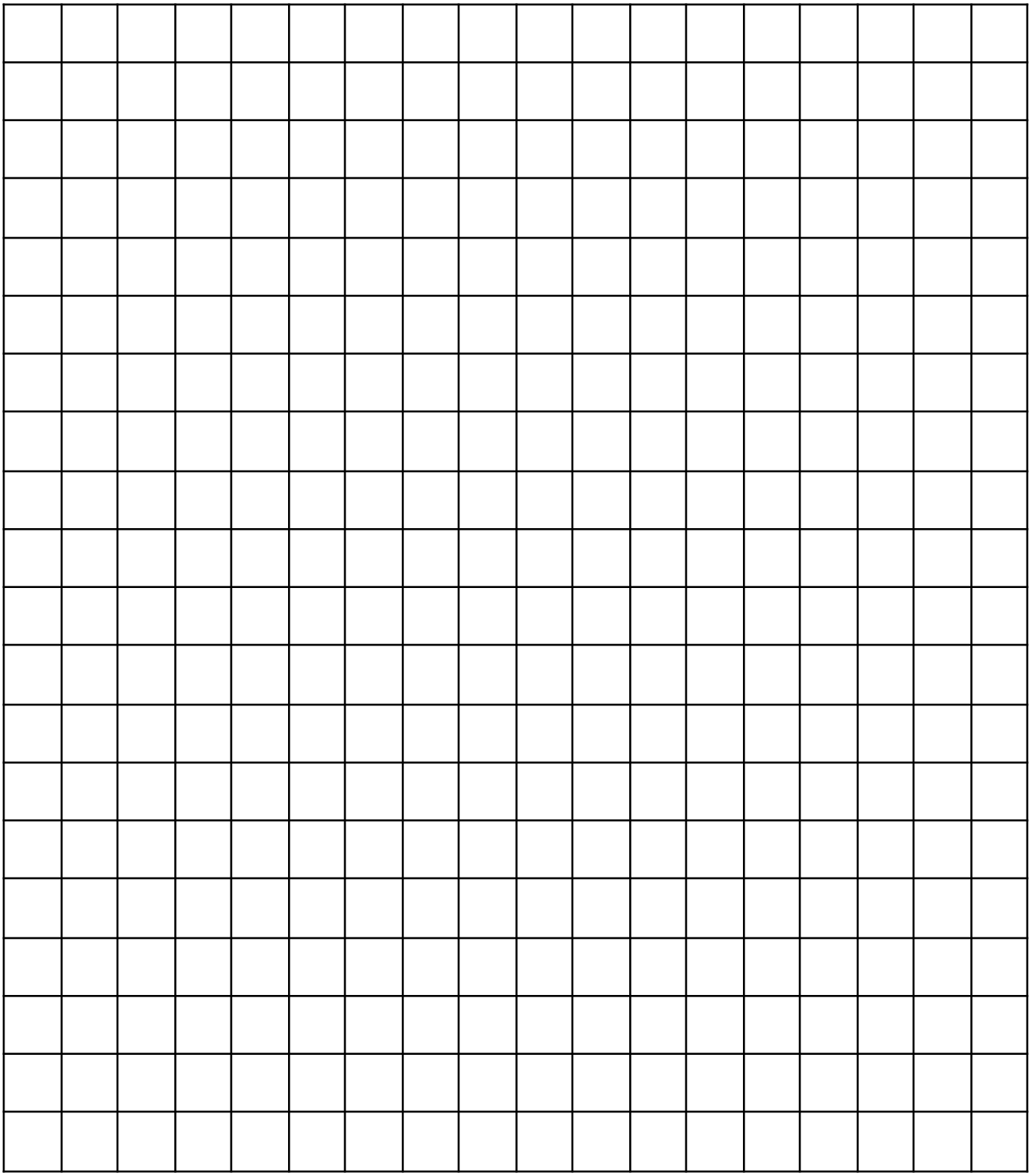
Which mirrors have the same area? _____

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

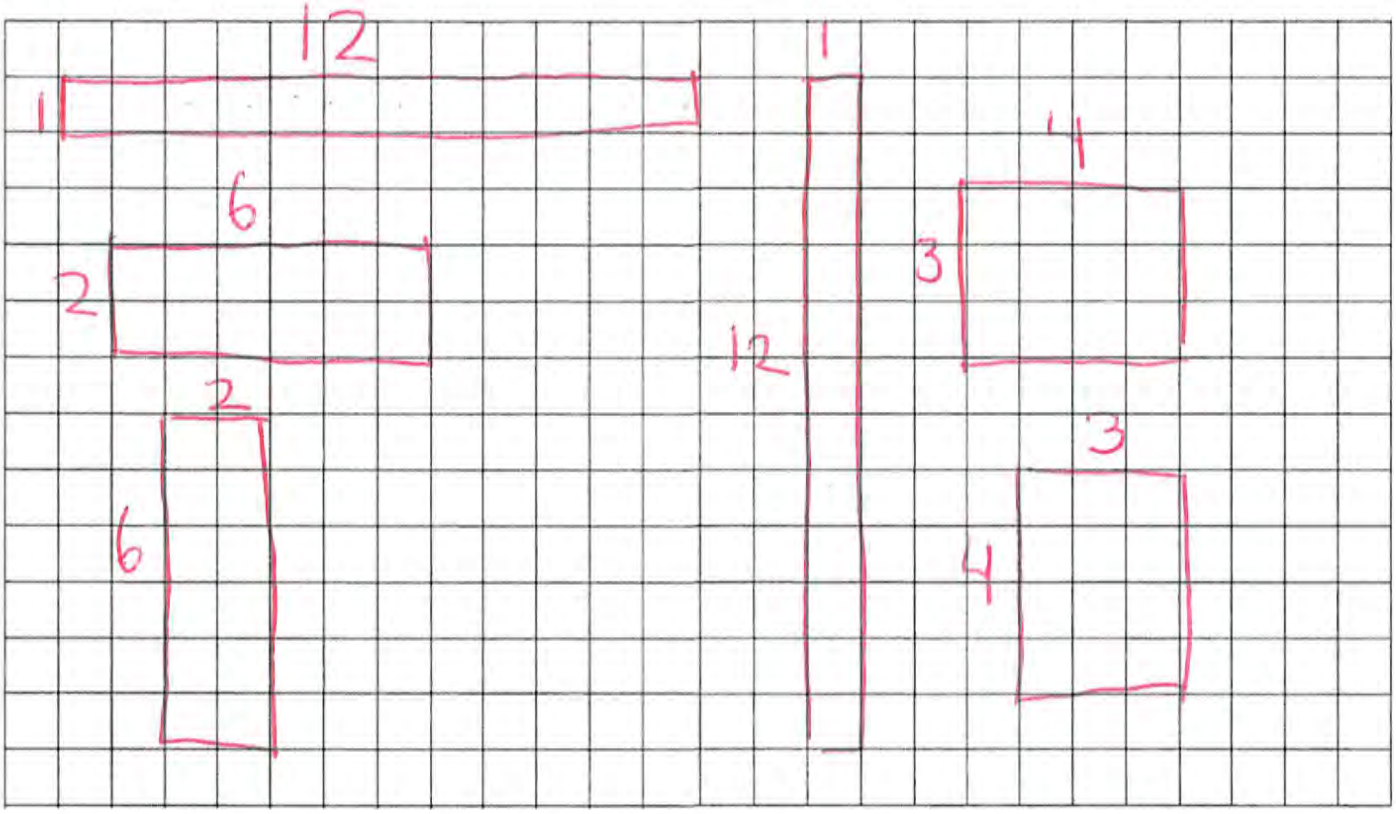
Grid Paper



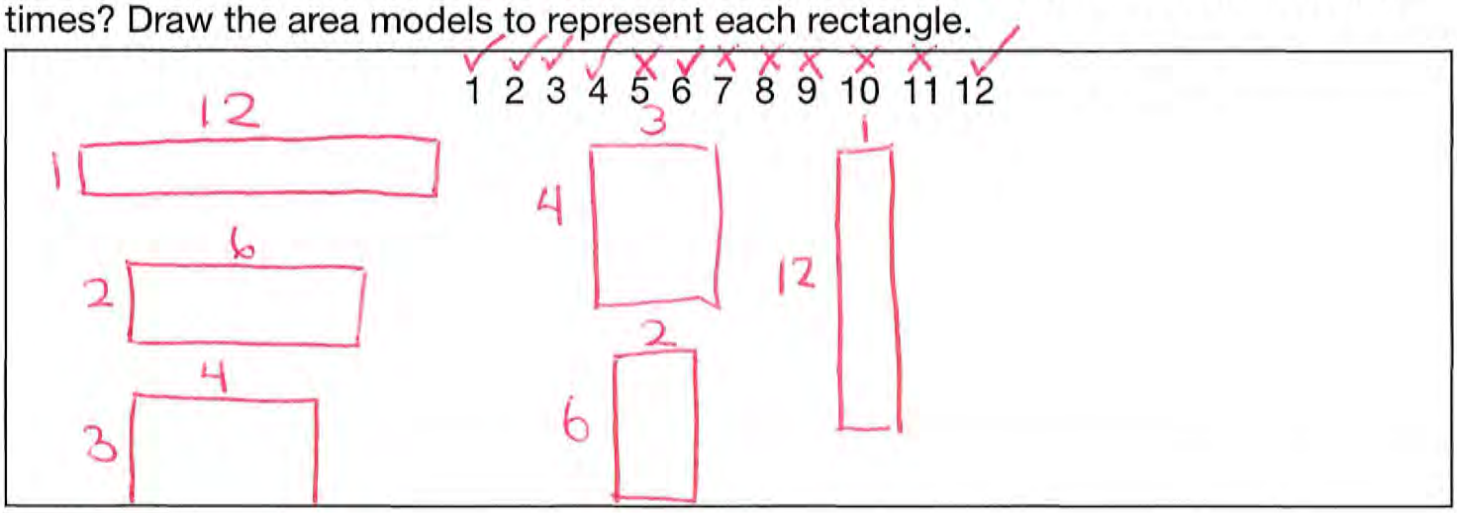
Name:_____ G3 U3 Lesson 4 - Let's Try It

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.**

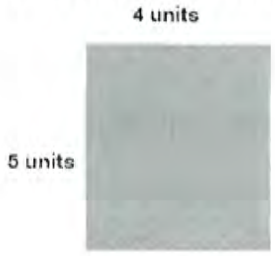


Use skip counting to find all the ways to make a rectangle with an area of 12 square units using whole numbers. Ask: Can I skip count by _____ to get to 12? How many times? Draw the area models to represent each rectangle.



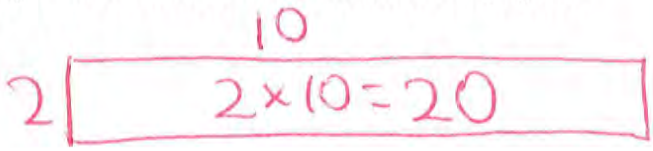
2. What is the area of this 5 units by 4 units rectangle?

5 rows of 4
5 × 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.



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 × 4 = 24

B. ~~B.~~

4 × 5 = 20

C.

3 × 8 = 24

D. ~~D.~~

9 × 3 = 27

Which mirror has the largest area? Figure D

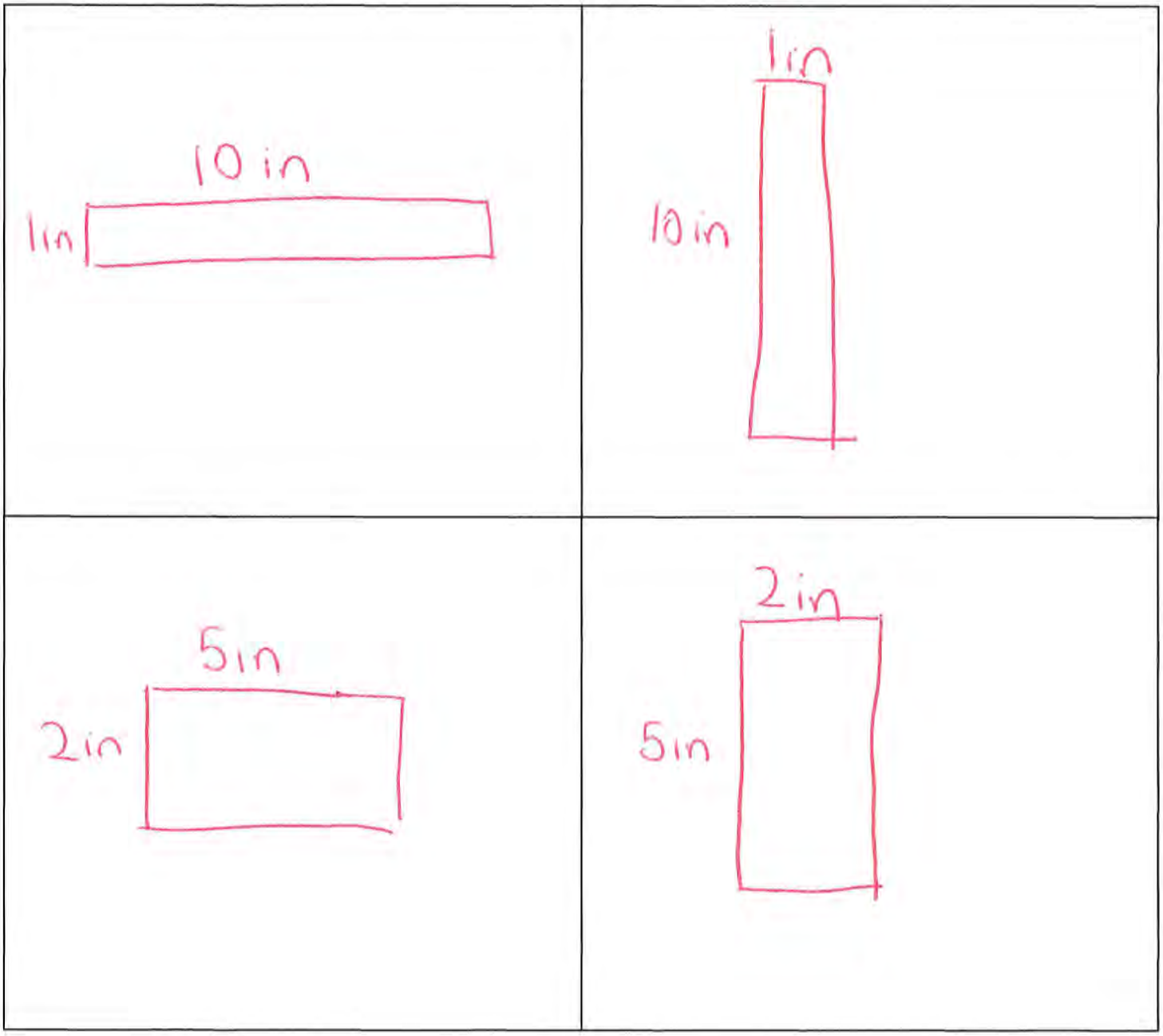
Which mirror has the smallest area? Figure B

Which mirrors have the same area? Figures A and C

Name:_____ G3 U3 Lesson 4 - Independent Work

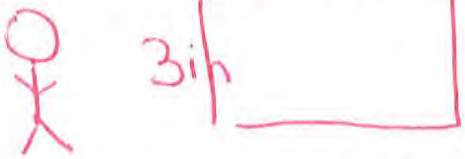
I will decompose and recompose rectangles to compare areas.

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.**

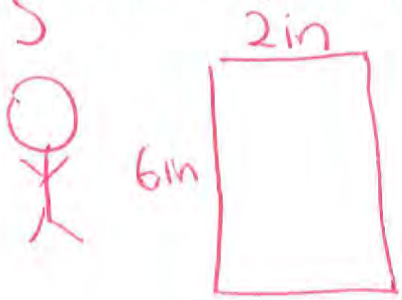


2. Aiden paints a rectangular design on a small piece of paper with side lengths of 3 inches by 4 inches. Sariah paints a rectangular design on a small piece of paper with size lengths of 6 inches by 2 inches. Sariah says her design is bigger. Is she right? Show your work and explain why or why not. Hint: Use your tiles to help you. Note: Encourage them to draw a picture.

Aiden



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!

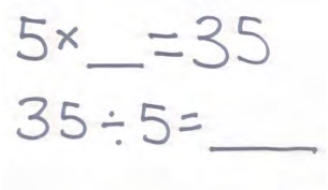
Let's Talk (Slide 5): Let's warm up our brains with a problem we learned about yesterday. So, Mr. Green is planting a rectangular garden that has an area of 12 square yards. What are the side lengths of different rectangles he could use for his garden? Work with your partner and use your tiles if they 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.

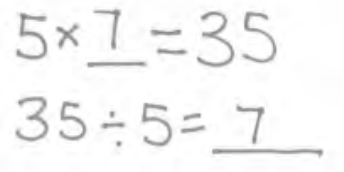
Great job finding rectangles that have different side lengths with an area of 12 square units. Now we are going to solve problems where we know the area, but I am also going to give you one side length and you need to figure out the missing side length! For example, if I told you his garden was 12 square 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.

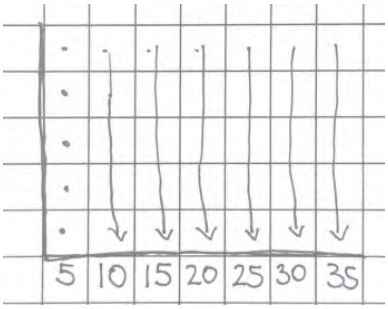


Well, that means that 5 groups of something will make 35. We can write an equation to help us represent that. Look, we know there's a total of 35 tiles so we know that 5 times SOMETHING will give us 35. So, think 5 x __ = 35. Or, another way to think about that is 35 divided by 5 will give us that unknown. So 35 ÷ 5= ___.



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.

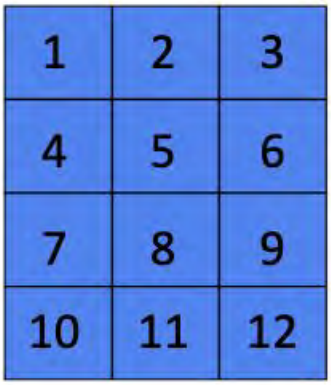
Let's Try it (Slides 9-10): Now let's work on finding the unknown side length of rectangles. Remember the one side length we know tells us how many rows or how many columns, and we can skip count by that number until we get to our total area. This will help us find the missing side length. We are going to work on the first page step-by-step.

WARM WELCOME

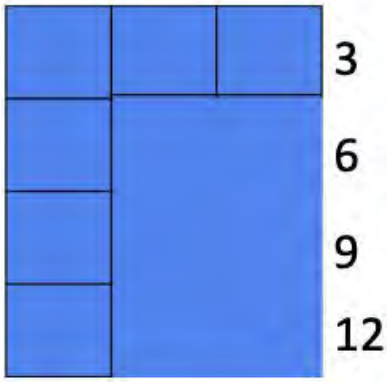
Let's Review:

How can we find the area of a rectangle?

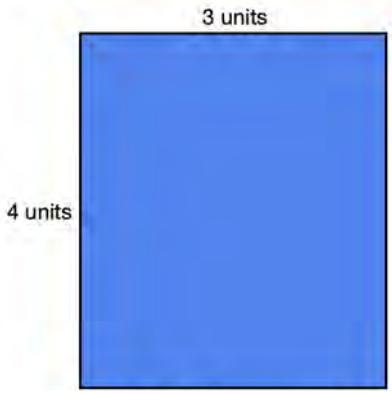
We can fill the inside and **count all** the square tiles.



We can **skip count** the equal groups.



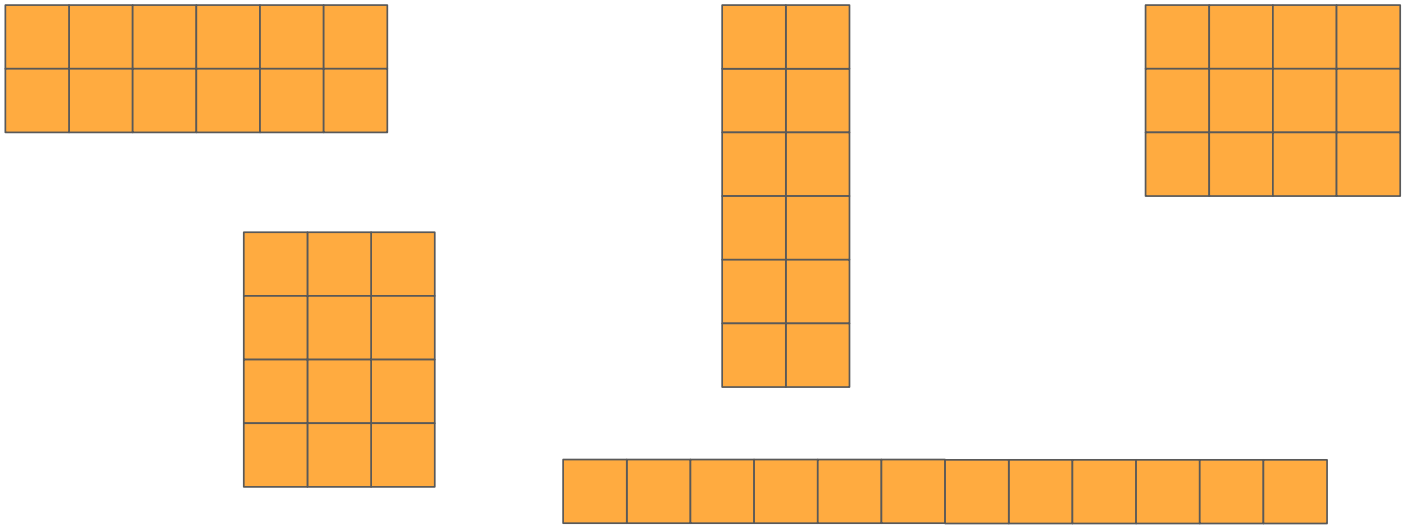
We can **multiply** the side lengths.



4 x 3 = 12 square units

Let's Review:

Rectangles can have the same area but different side lengths.



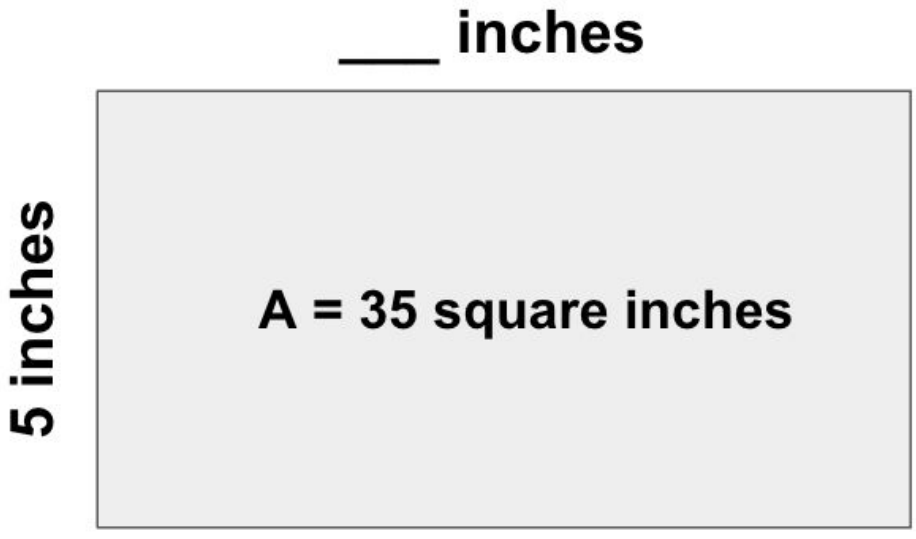
Today we will find the **unknown side length** of a rectangle.

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?

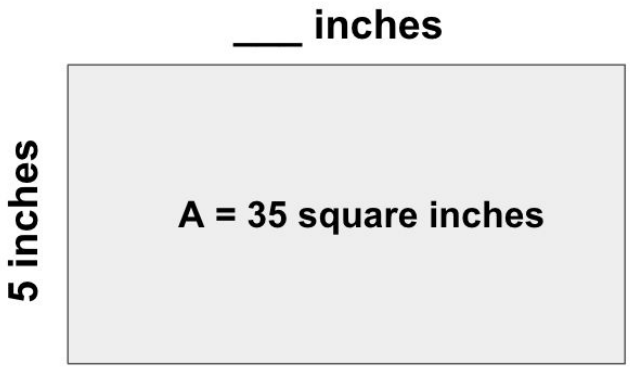
Let's Think:

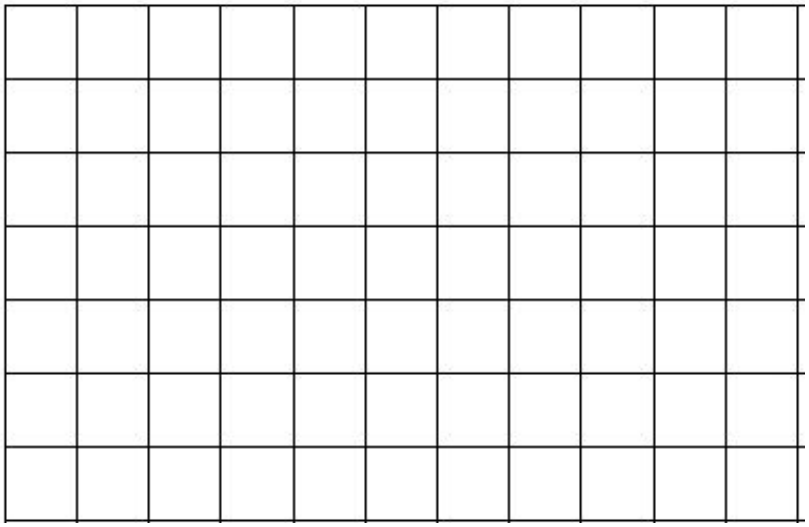
How can we find the missing side length?



Let's Think:

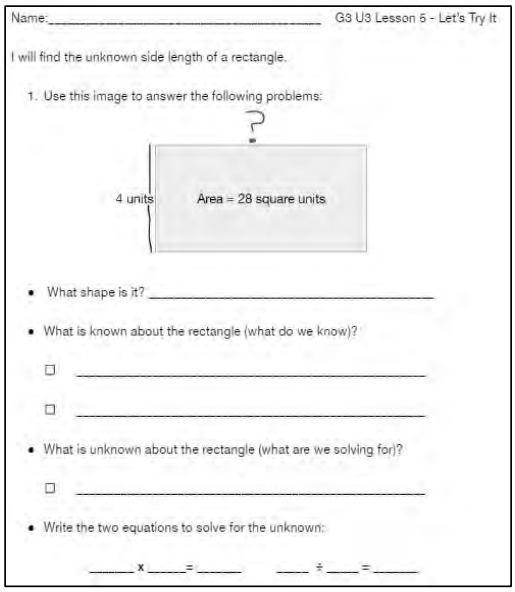
How can we find the missing side length?





Let's Try It:

Let's explore answering questions about area and the unknown side length together.



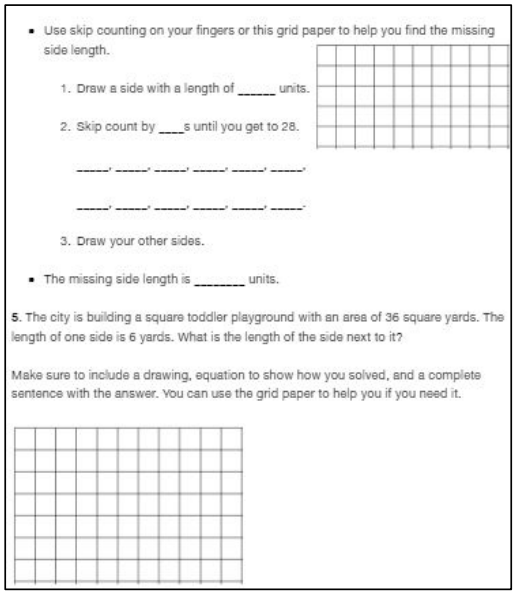
Name:_____ G3 U3 Lesson 5 - Let's Try It

I will find the unknown side length of a rectangle.

1. Use this image to answer the following problems:

- 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.

     _____, _____, _____, _____, _____, _____,

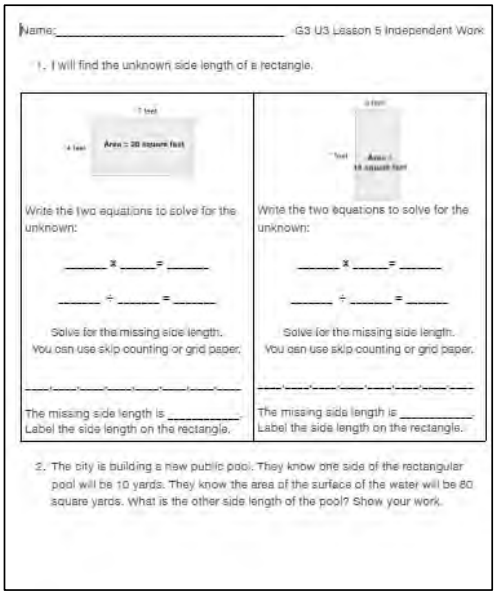
     _____, _____, _____, _____, _____, _____.
  3. Draw your other sides.
- The missing side length is _____ units.

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

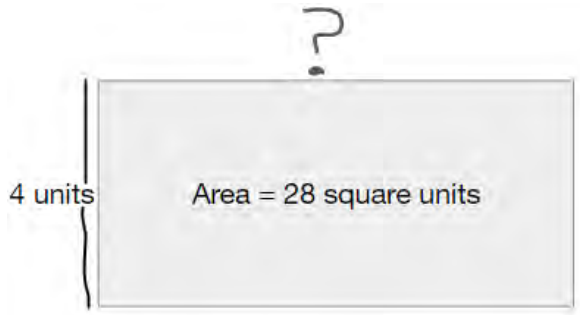
1. I will find the unknown side length of a rectangle.

Write the two equations to solve for the unknown: _____ * _____ = _____ _____ ÷ _____ = _____ 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.	Write the two equations to solve for the unknown: _____ * _____ = _____ _____ ÷ _____ = _____ 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.

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)?

   ☐ _____

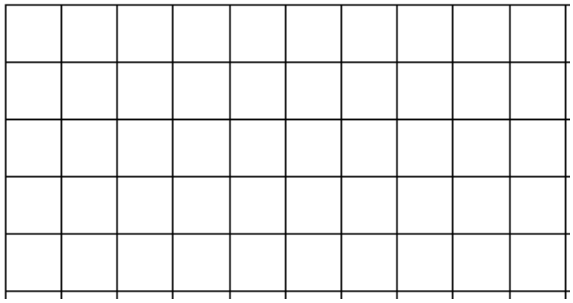
4. Write the two equations to solve for the unknown:

   _____ **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.

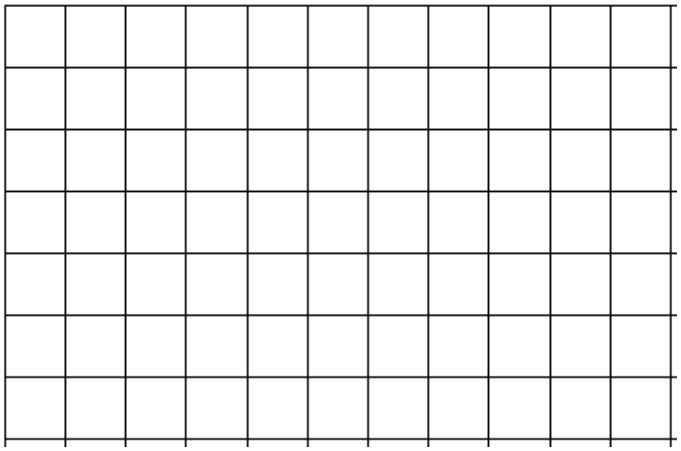


_____, _____, _____, _____, _____, _____, _____

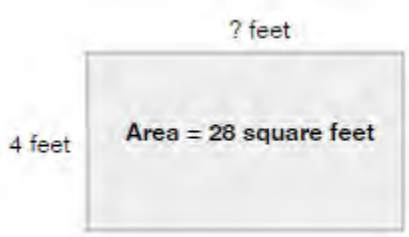
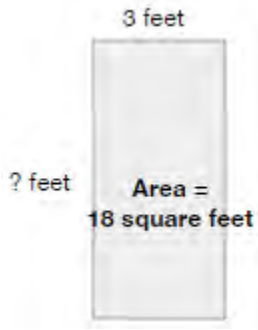
6. The missing side length is _____ units.

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.



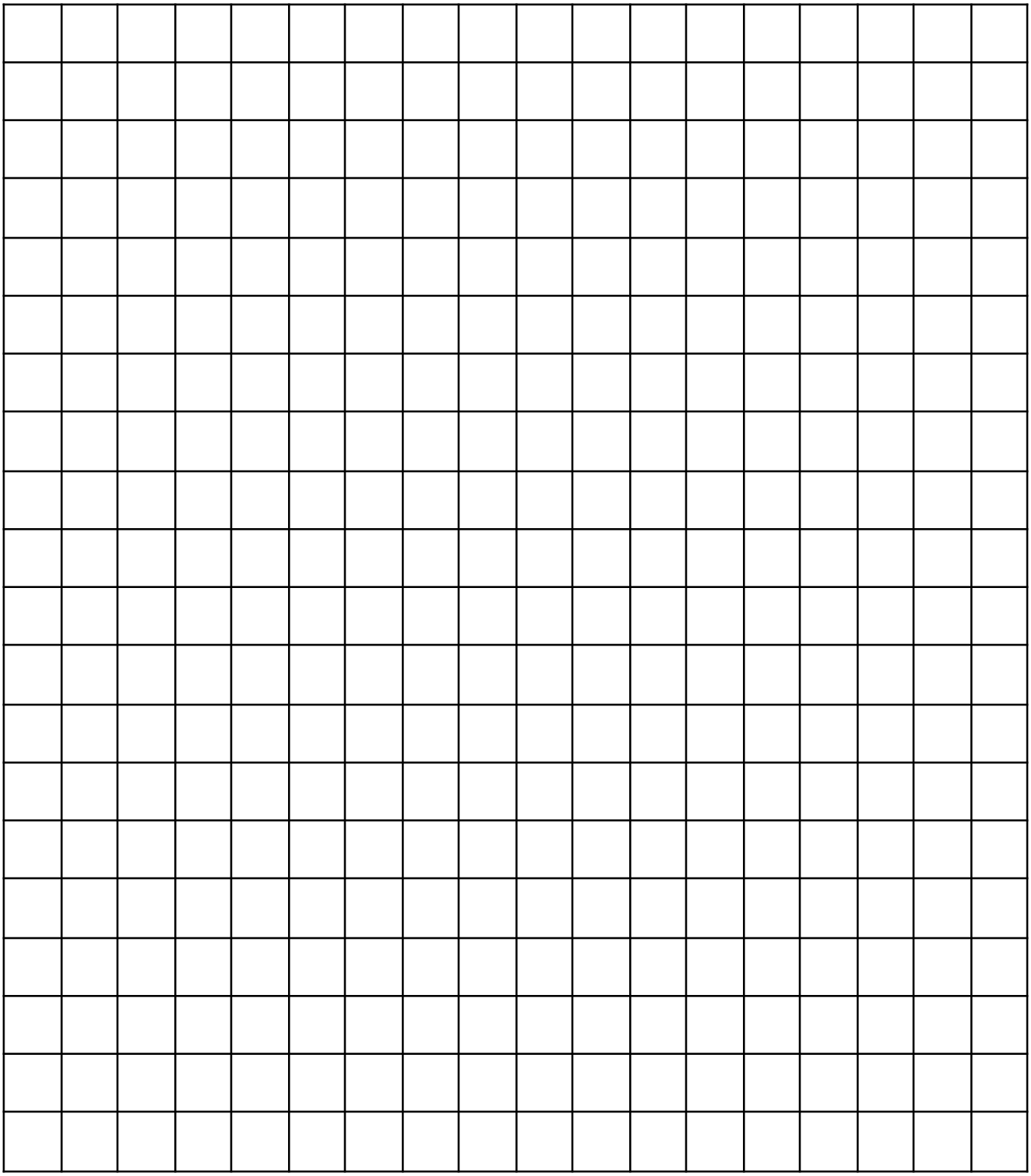
Name:_____ G3 U3 Lesson 5 - Independent Work

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

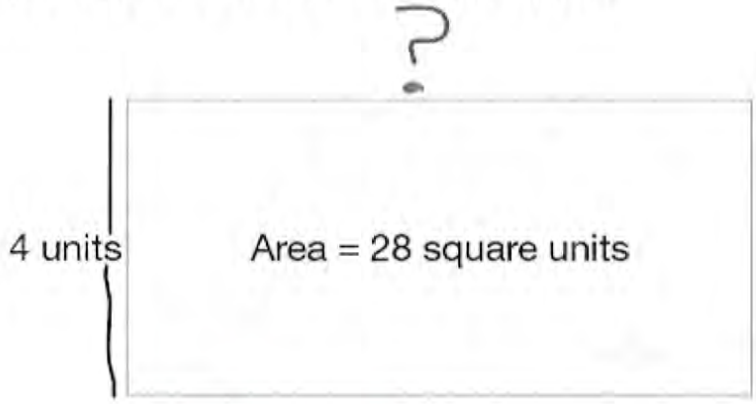
Square Centimeter Tiles



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:



- What shape is it? rectangle

- What is known about the rectangle (what do we know)?

  ☐ Area= 28 square units

  ☐ 1 side length= 4 units

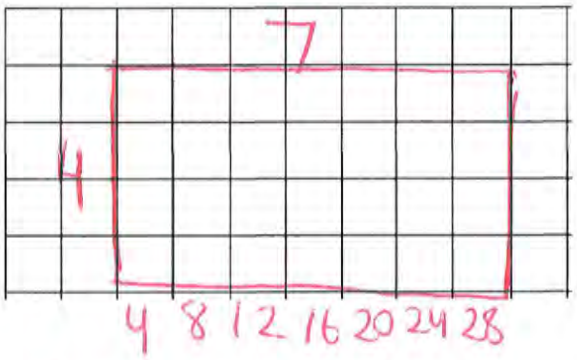
- What is unknown about the rectangle (what are we solving for)?

  ☐ 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 4s until you get to 28.

4 (1), 8 (2), 12 (3), 16 (4), 20 (5), 24 (6),
28 (7), ____, ____, ____, ____, ____.

7 groups of 4 = 28

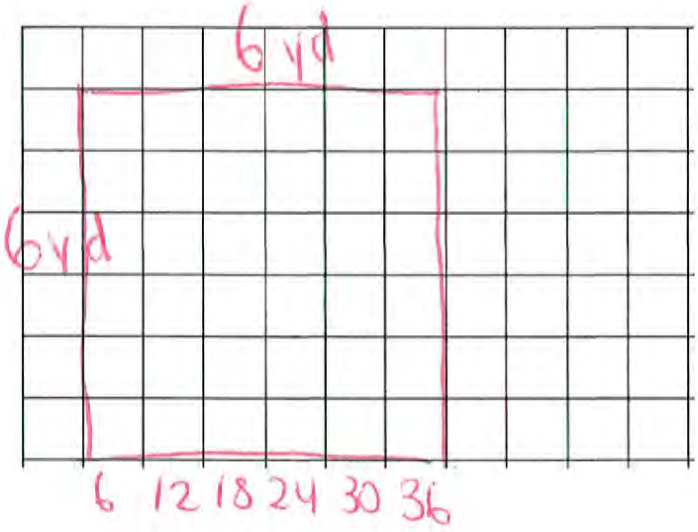
Note: count how many times you skip counted by 7.

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.



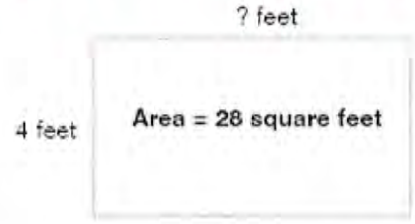
$6 \times 6 = 36$

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:

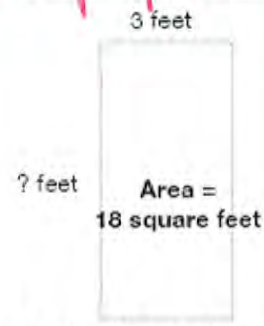
4 x ____ = 28

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

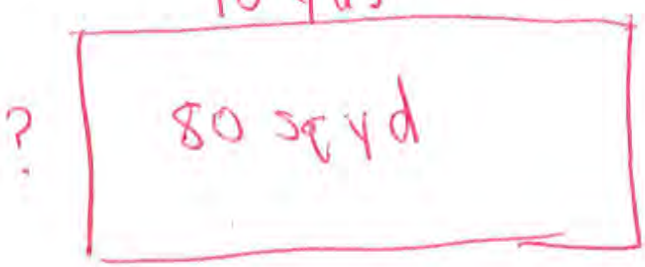
18 ÷ 3 = ____

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

10 x 8 = 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.

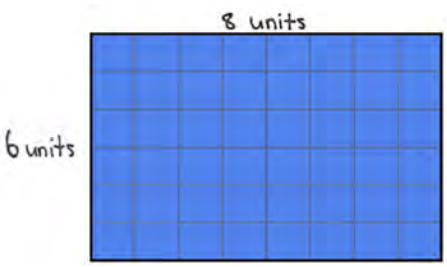
Frame the Learning/Connect to Prior Learning (Slide 3): Today we will decompose rectangles using tiling. Decompose means to break apart. So far in this unit, we have been finding the area of rectangles with smaller side lengths, like 2 inches, 3 inches, 4 inches, and 5 inches. Today we will look at rectangles 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.

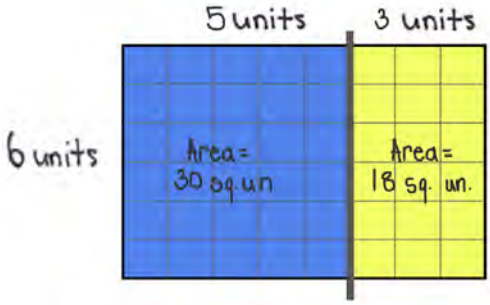
So, to make it easier to find the area, we can decompose or break apart the rectangle. If I want to decompose, or break apart this rectangle I can break apart the rows OR I can break apart the columns (*drag finger across and up and down*). One strategy I can use to decompose my rectangle is to think 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)*.

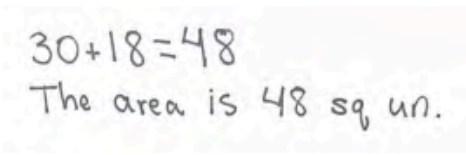
So, if we want to find the area of JUST the blue rectangle, we can multiply the side lengths. There are 6 rows of 5. And, 6 rows of 5 is the same as 6x5. That means we can count by 5 six times. Let's do that together. 5, 10, 15, 20, 25, 30, 35. *(Slide finger across each row as you skip count by 5s).* 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!

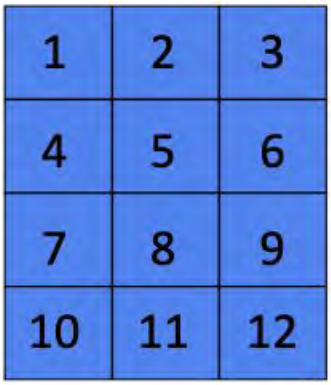
Let's Try it (Slides 9-10): Now let's work on decomposing the rectangles with tiling. Remember, decomposing rectangles is one way to help us find the area of larger rectangles. It doesn't matter where you decompose the rectangle as long as you use all the rows and columns. We are going to work on the first page step-by-step.

WARM WELCOME

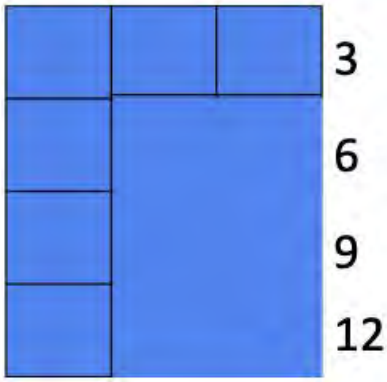
Let's Review:

AREA is the amount of space a 2-D shape takes up.

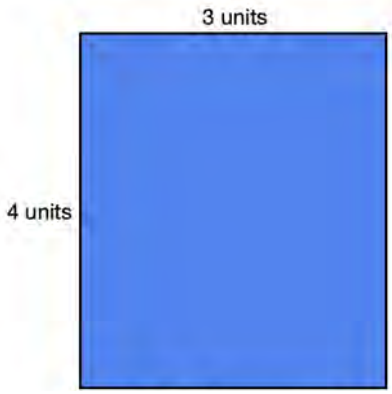
We can fill the inside and **count all** the square tiles.



We can **skip count** the equal groups.



We can **multiply** the side lengths.

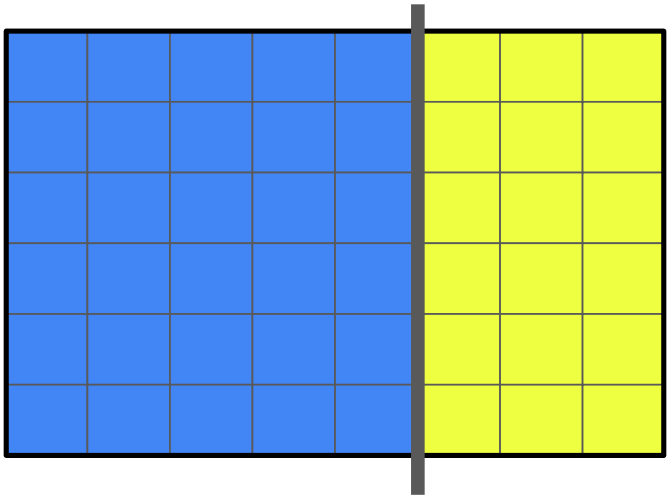


4 x 3 = 12 square units

Today we <u>decompose</u> rectangles with square tiles.

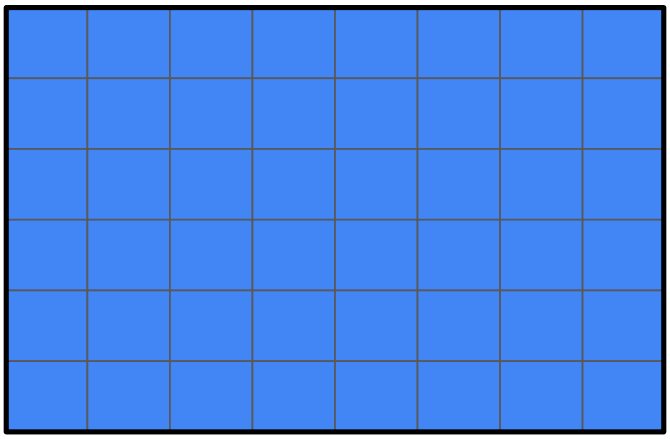
Let's Talk:

What do you notice and wonder about this rectangle?



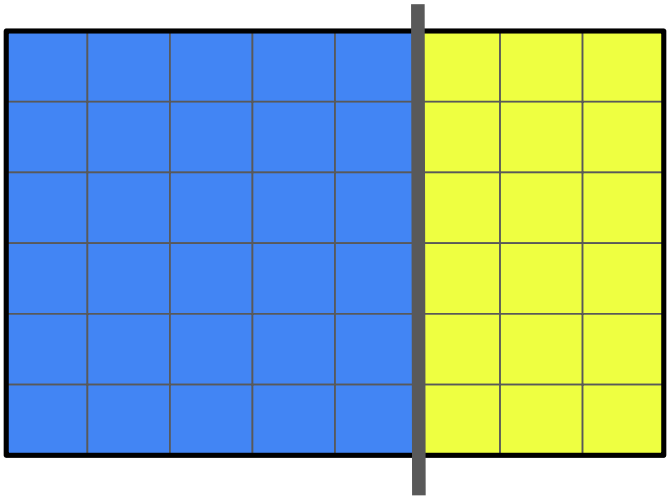
Let's Think:

How can we find the area of this large rectangle?

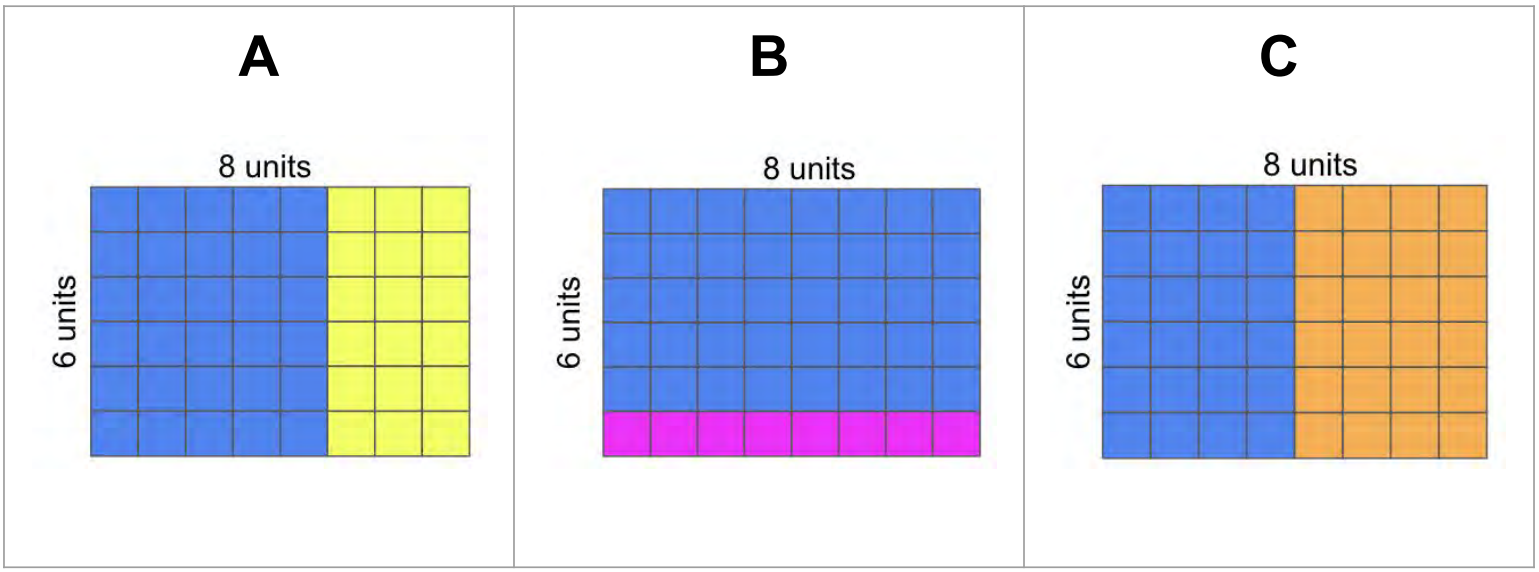


Let's Think:

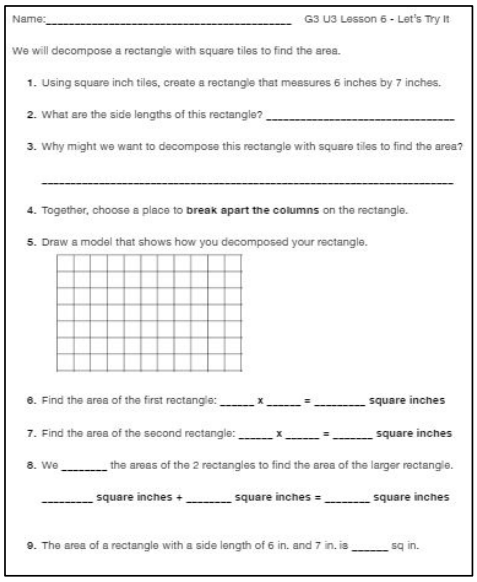
How can we find the area of this large rectangle?



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?

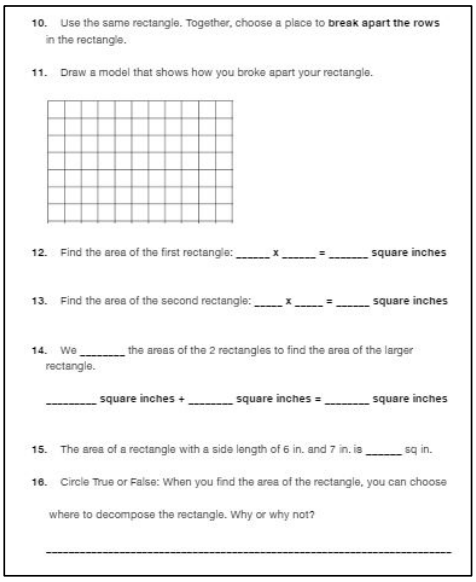
_____

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?

_____

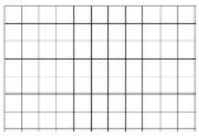
On your Own:

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.

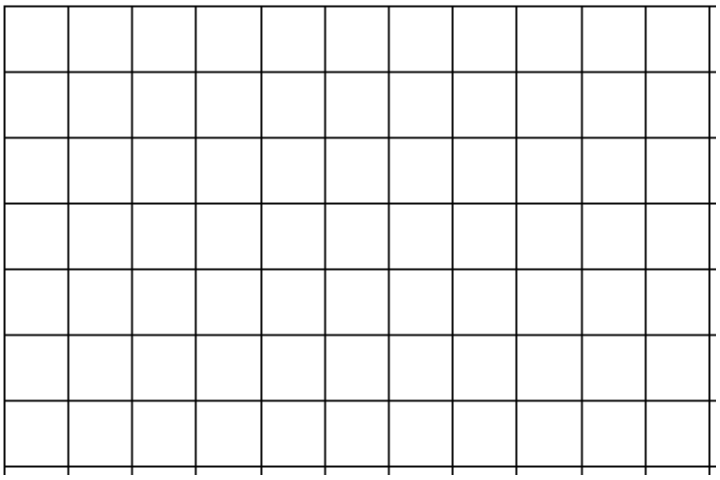
Name:_____ G3 U3 Lesson 6 - Let's Try It

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**

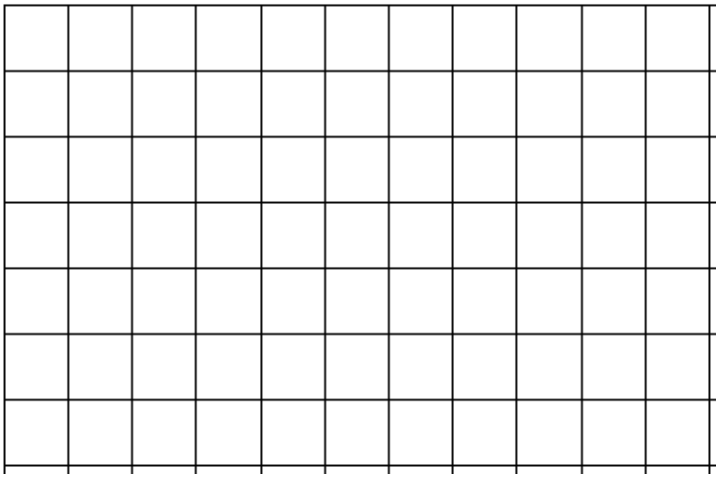
7. We add the areas of the 2 rectangles to find the area of the larger rectangle.

   _____ **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?

_____

_____

_____

_____

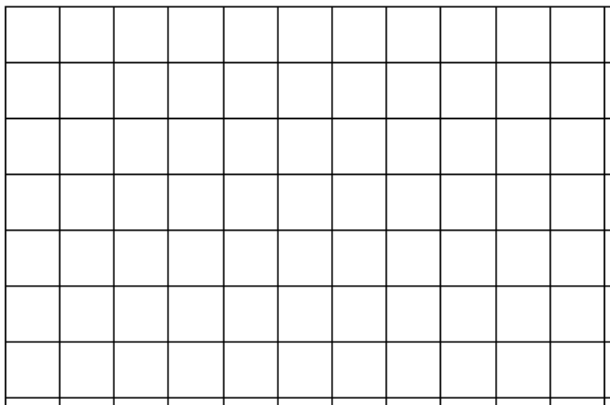
Name: _____ G3 U3 Lesson 6 - Independent Work

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.

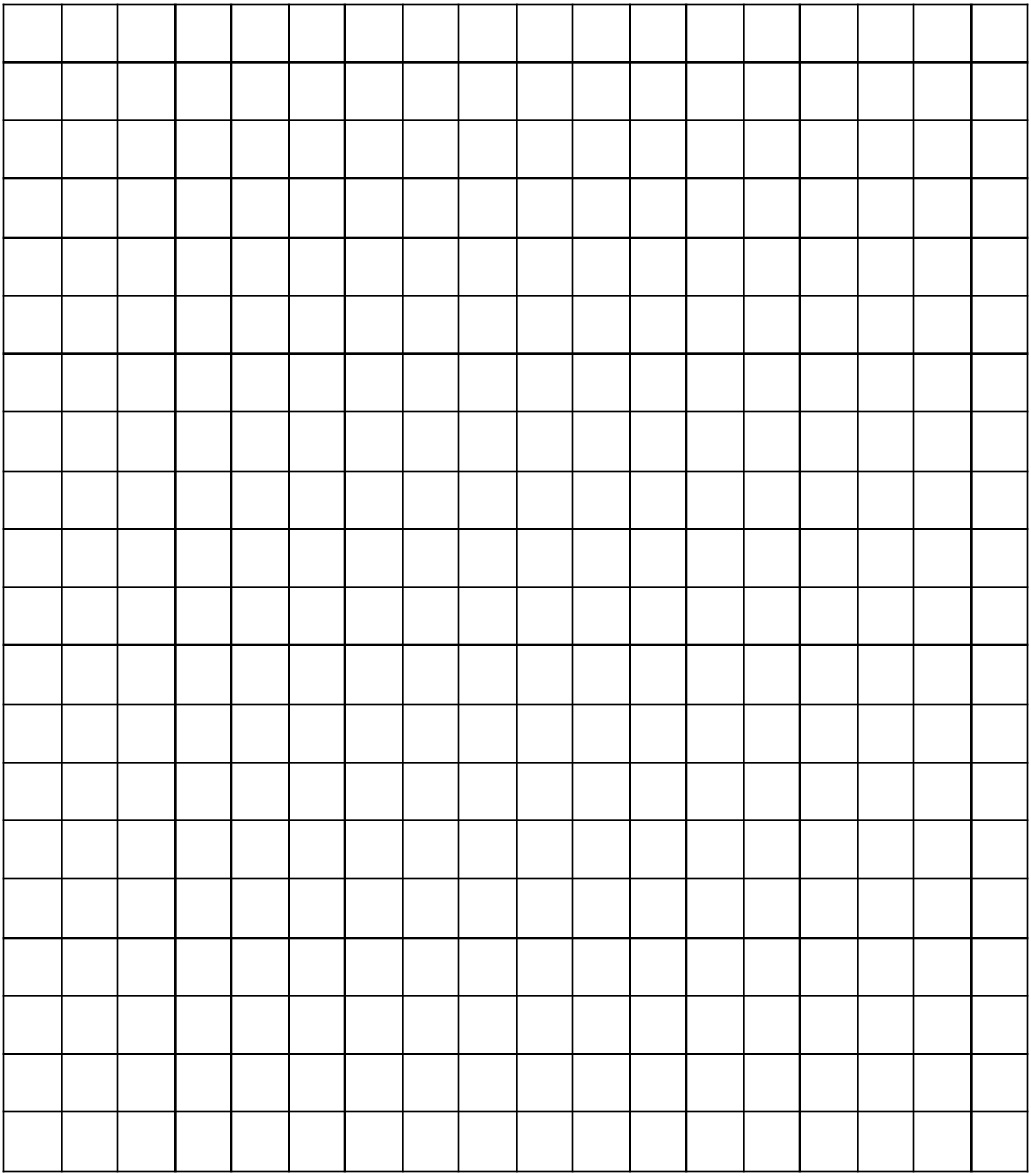
_____ square inches + _____ square inches = _____ square inches

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.

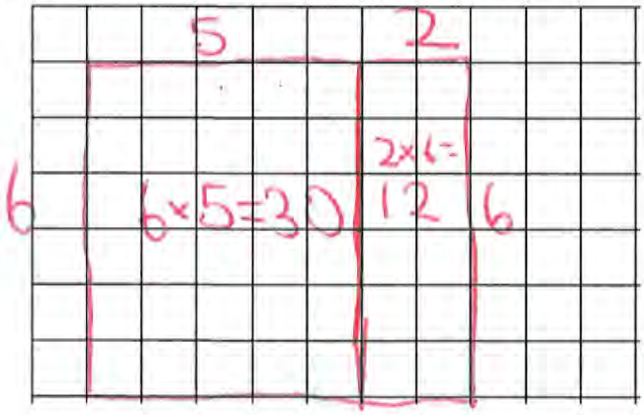
2. What are the side lengths of this rectangle? 6 inches and 7 inches

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.

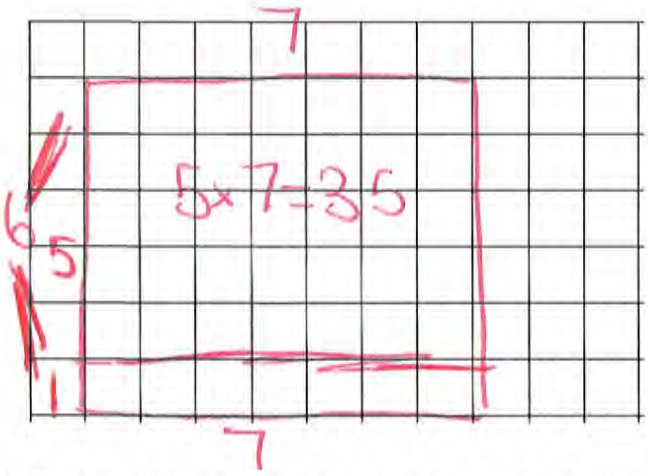
30 **square inches +** 12 **square inches =** 42 **square inches**

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
10+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.

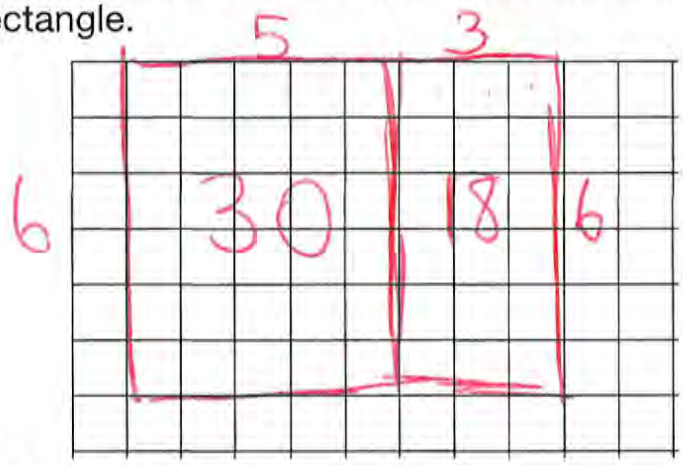
Name:_____ G3 U3 Lesson 6 - Independent Work

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.

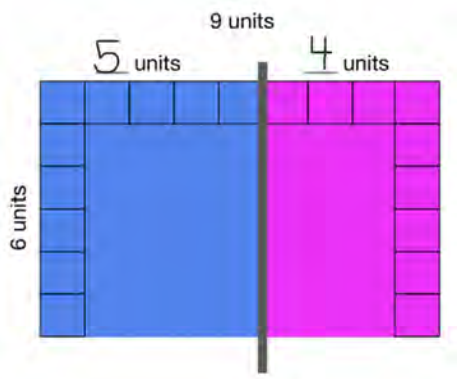
Let's Think (Slide 5): Here we have a BIG, BIG rectangle. We want to find the area of the BIG rectangle (*trace side lengths*). Instead of using one of our three strategies to find an area, we're going to come back to what

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.

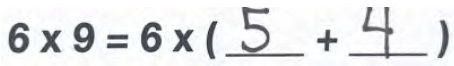
What is the vertical side length, or how many rows does this rectangle have? 6 rows! That's right, so the length of this side is 6 units. And let's look across the top, how many columns are there? Remember, we're looking at the WHOLE side length (*drag finger across blue and pink*). 9 columns! That's 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.

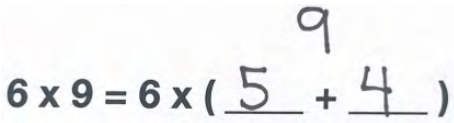
Let's Think (Slide 6): Look at this! This is the same rectangle, we still have 6 rows and 9 columns (*count to show*). But, we decomposed it into smaller rectangles! Now, we have the blue rectangle and the pink rectangle which make up the BIG rectangle. On this one, we cut the columns.



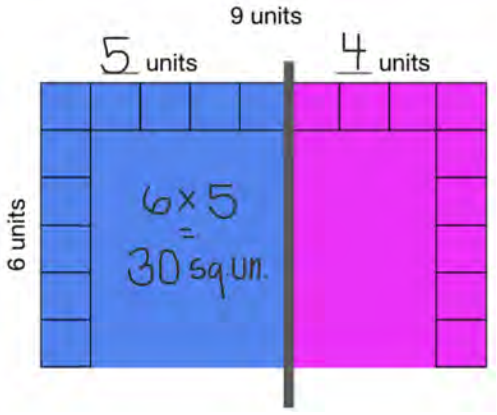
We decomposed the 9 units (*slide finger across)* into two smaller units *(point to the 2 blanks under the 9 on the image)*. How did I decompose the 9 units? Into 5 units and 4 units! That's right, we cut the 9 columns into 5 columns and then 4 columns (label on slide). So instead of looking at this 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.



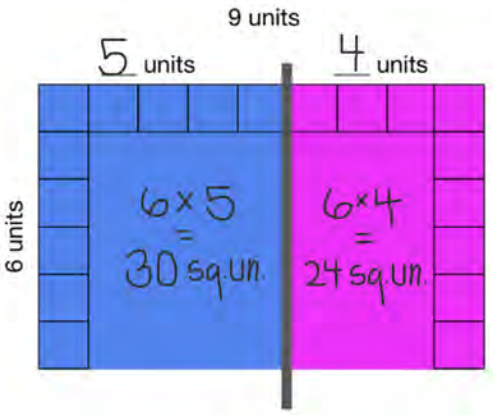
We can show this in our equation…6 x 9, which is the area of the BIG rectangle, is equal to, 6 groups of 5 AND 6 groups of 4 (*point to the 5 units and 4 units that you labeled on the rectangle).* So, we replaced the 9 with 5 and 4 because we split it into pieces. So, in our equation we can rename the 9 (*point to 9 in the equation)* as what? 5 + 4!



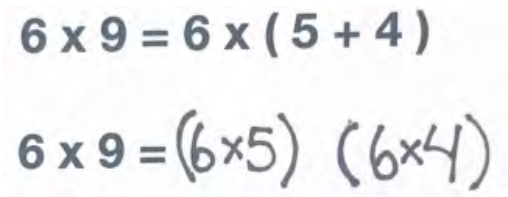
Before we keep going, these are called parenthesis (*point)*. Let's say it together…parenthesis! Parenthesis in math show how we group numbers. We are grouping the 5 and 4 together because it makes 9, and 9 is the side length of the larger rectangle. Let's look closely at this equation, 6 times 9 EQUALS 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.

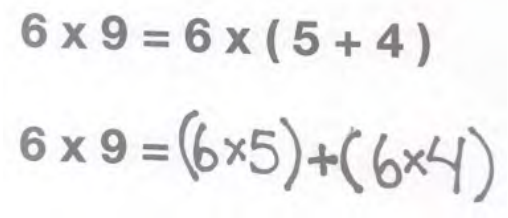


Now let's find the area of the pink rectangle. What's the most efficient way to find the area? Multiply the side lengths! We didn't cut the rows, so we still have 6 rows but now we have 6 rows of 4 (*cover blue rectangle with hand*). So, the pink rectangle has 6 rows of 4, which is the same as what multiplication 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.

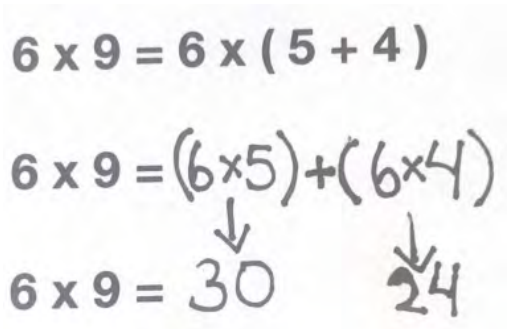


Now let's show what we did with our equations, this is the new part! So, we found the area of the blue rectangle by distributing the 6 rows to the 5 columns. We found the area of the pink rectangle by distributing the 6 rows to the 4 columns. Let's write that as an equation to show how we found the area of the smaller rectangles. For the blue rectangle we multiplied what? 6 x 5.

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.

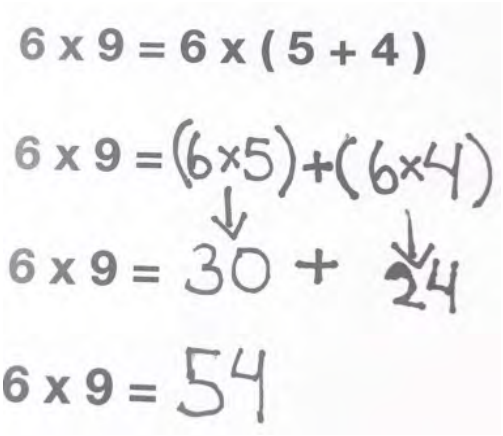


So, what is (6x5) or 6 rows of 5 tiles? We already solved that for the blue rectangles…30 square units! Let's draw an arrow to show that this 30 came from the (6x5) which is the blue rectangle.

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!



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.

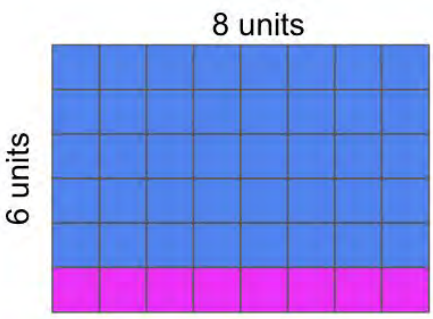
WARM WELCOME

Let's Review:

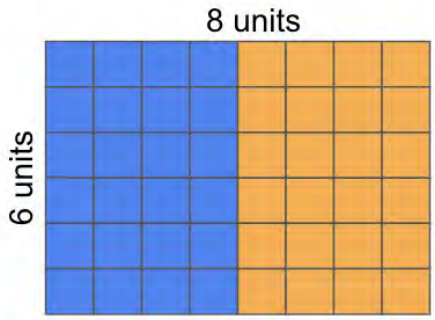
We can break apart rectangles into smaller rectangles to find the area.

A

B

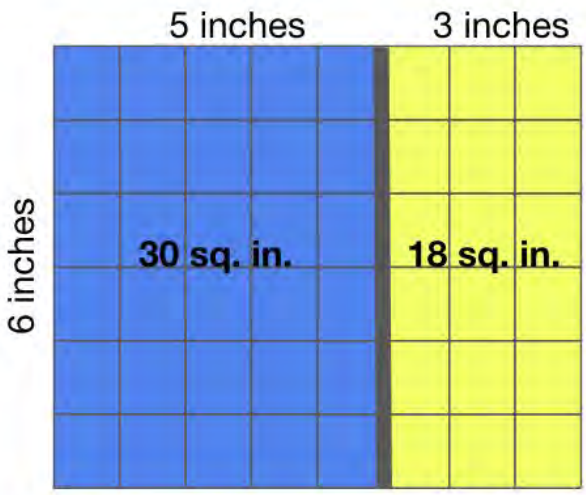


C

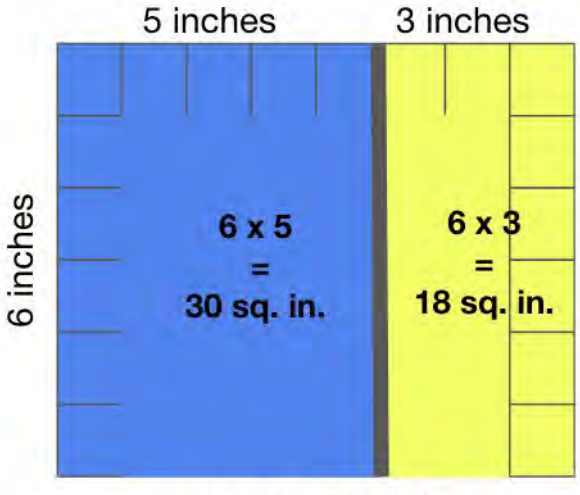


Today we apply the **distributive strategy** to find the **total area** of a large rectangle by **adding two products.**

Let's Talk: What is the **same**? What is **different**?



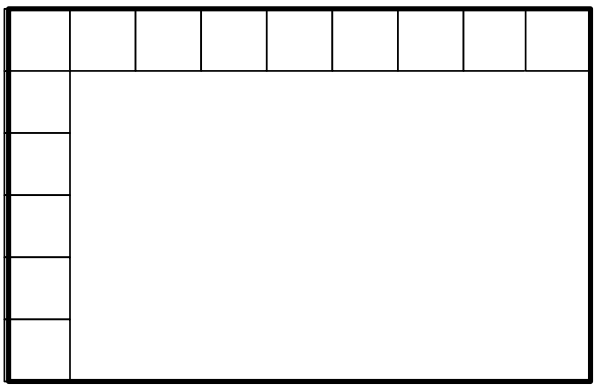
30 sq. in. + 18 sq. in
= 48 square inches



(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



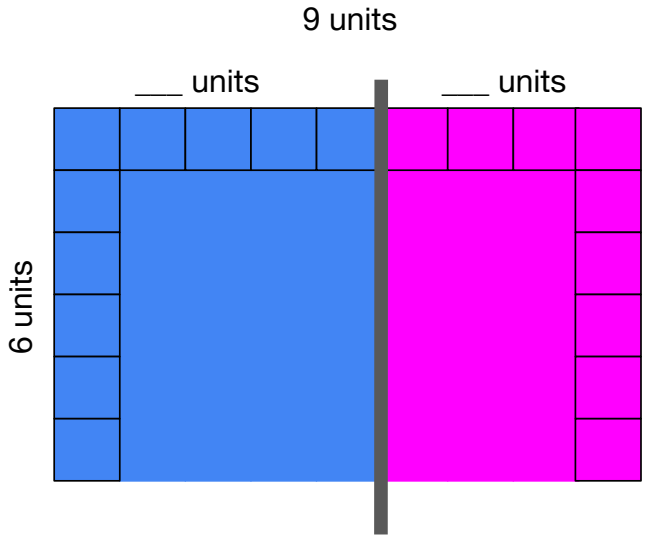
Let's start with a **BIG** rectangle…

_____ 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:

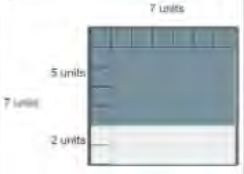
Now you can decompose rectangles with tiles on your own!

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 ____)

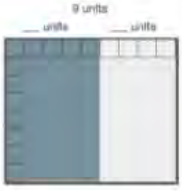
7 x 7 = _____ + _____

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 = _____ + _____

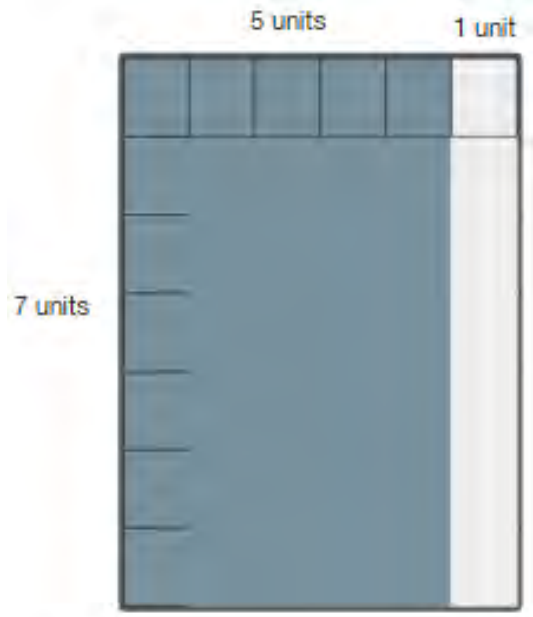
8 x 9 = _____

The area of an 8 units by 9 units rectangle is:

_____

Name:_____ G3 U3 Lesson 7 - Let's Try It

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.

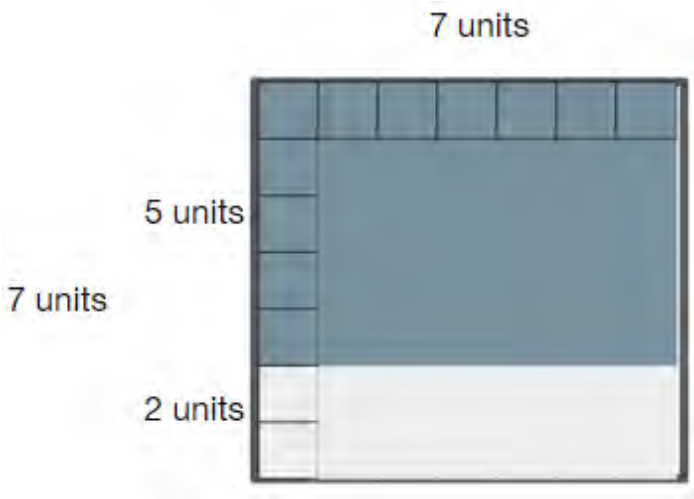
- The area of a rectangle that is 6 units by 7 units = _____ square units.

- 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 ____)

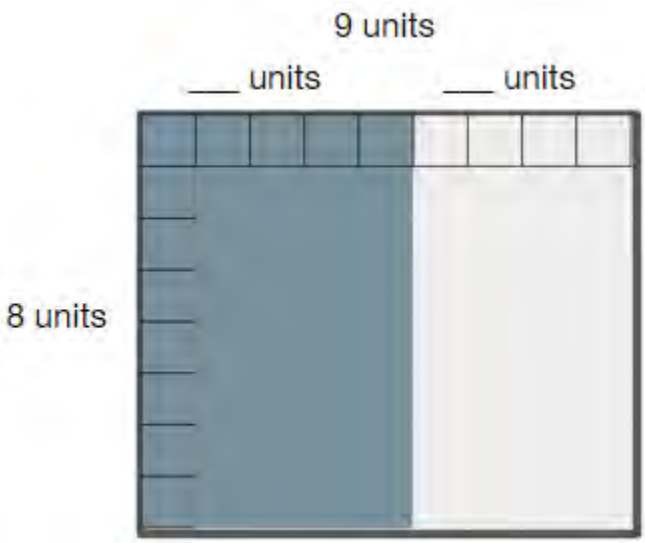
7 x 7 = _____ + _____

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 = _____ + _____

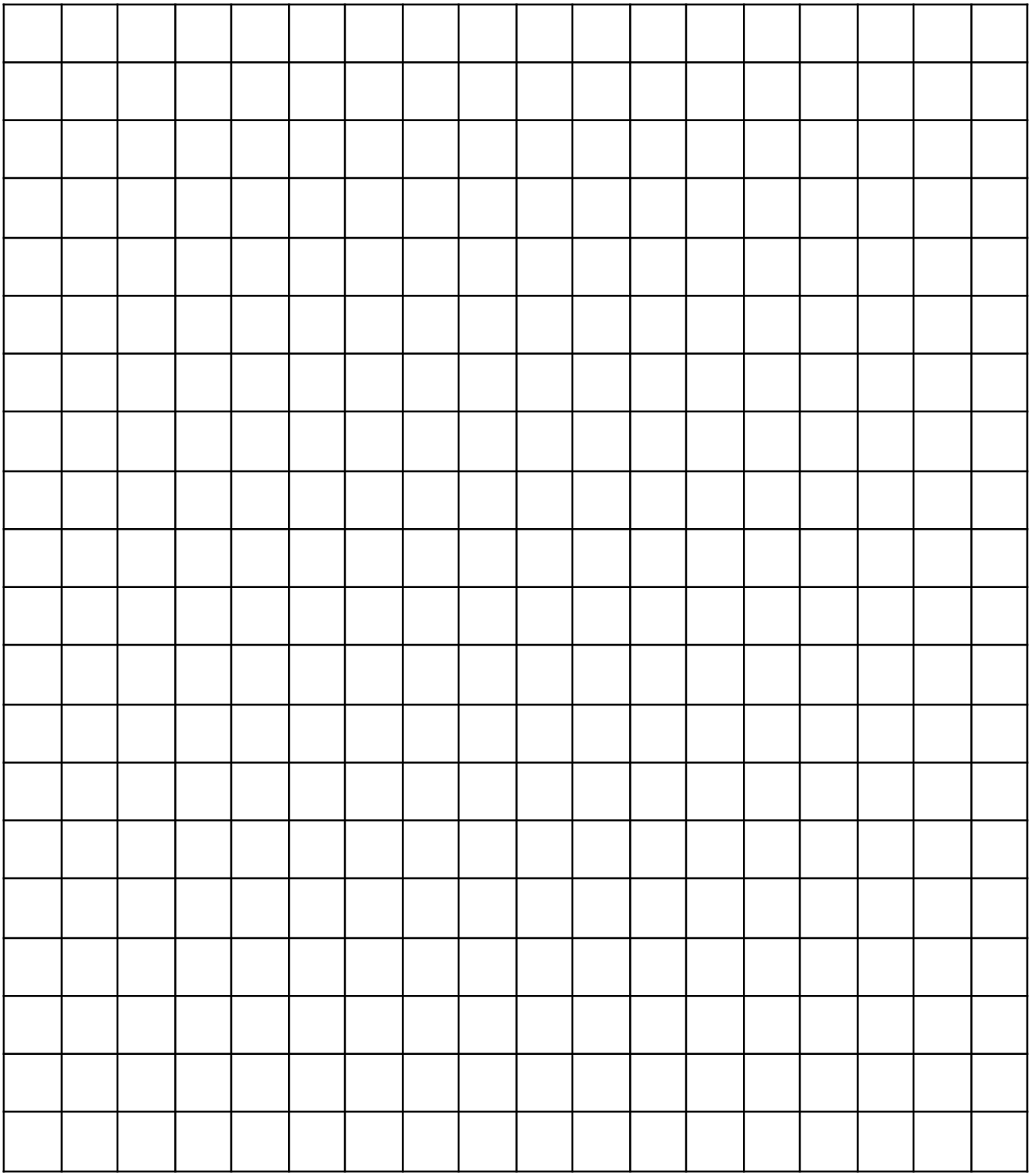
8 x 9 = _____

The area of an 8 units by 9 units rectangle is:

_____

Square Inch Tiles (Grid Paper)

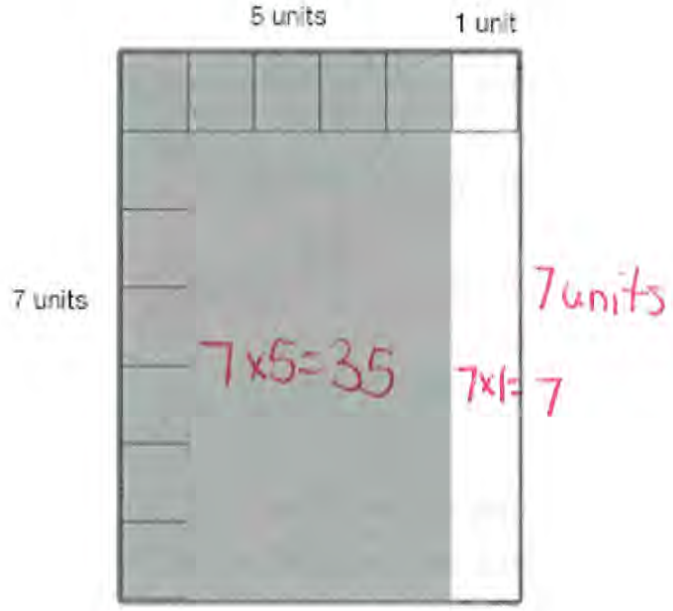
Square Centimeter Tiles (Grid Paper)



Name:_____ 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 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.

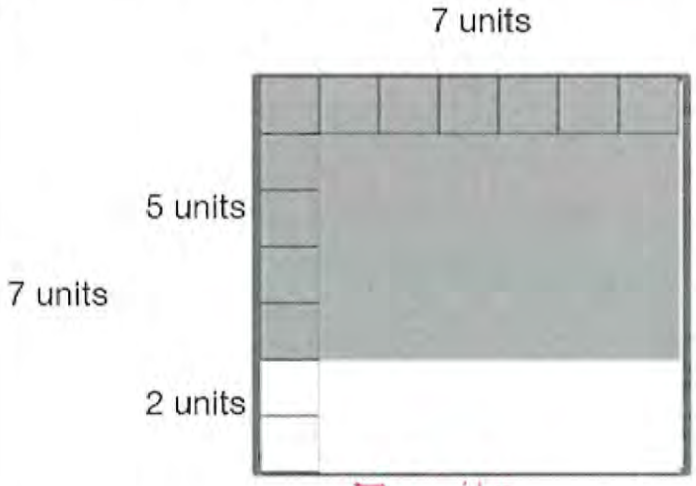
If we filled in all the squares of the large rectangle and counted the squares, there would be 42 square units.

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 units

$7 \times 7 = ?$

$7 \times 7 = (5+2) \times 7$

note: put the 5 and 2 first because students can think "5 rows of 7" "2 rows of 7"

$7 \times 7 = (\underline{5} \times \underline{7}) + (\underline{2} \times \underline{7})$

$7 \times 7 = \underline{35} + \underline{14}$

$30+10=40$ $40+9=49$

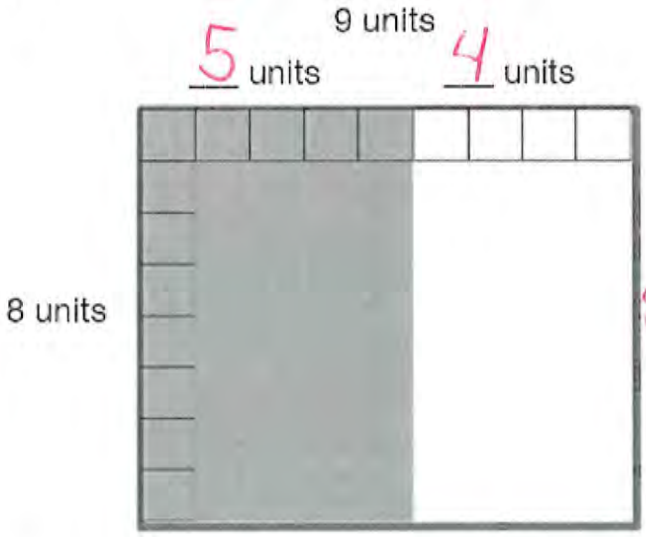
$5+4=9$

$7 \times 7 = \underline{49}$

The area of a 7 units by 7 units square is:

49 sq units

2.



8 units

$8 \times 9 = ?$

$8 \times 9 = 8 \times (5 + 4)$

$8 \times 9 = (\underline{8} \times \underline{5}) + (\underline{8} \times \underline{4})$

$8 \times 9 = \underline{40} + \underline{32}$

$8 \times 9 = \underline{72}$

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

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:

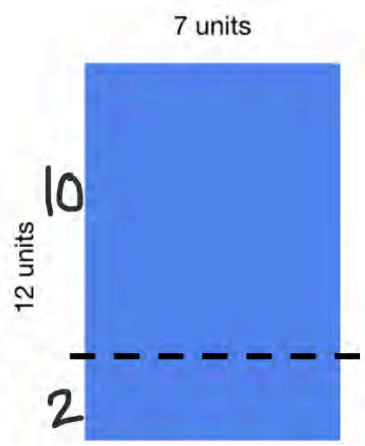
- I can decompose the 7 into 5 and 2 or 4 and 3.
- I can decompose the 12 into 10 and 2.
- I can decompose the 12 into 6 and 6 or 5 and 7.

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.

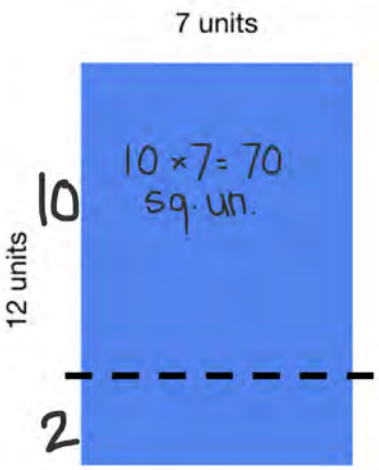
No matter how you cut this rectangle, you'll get the same area.

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!



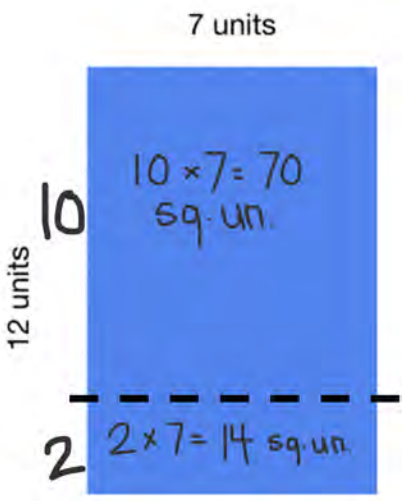
I know the equal sign means the same as, so I want both sides of the equation to be balanced, or the same. I see 12 x 7 on one side *(point)*. I see 10 + 2 in parenthesis and then times 7 on the other side. I know 12 is the same as 10 + 2 so you can see I decided to break the 12 rows into 10 rows plus 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!

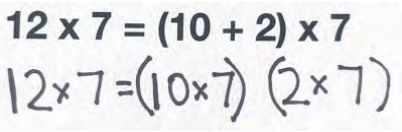
That means if I filled in all the rows and columns I would have how many tiles? 70 tiles. The area of the top smaller rectangle is? The area is 70 square units.



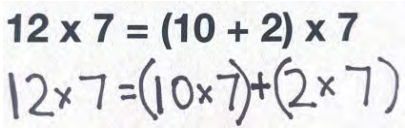
Now we need to find teh area of the bottom rectangle! I can imagine two rows of _____. Hmm what is this bottom side length? Well if this length is 7 units *(point to the top side)* then the opposite side length is also 7 units/

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.

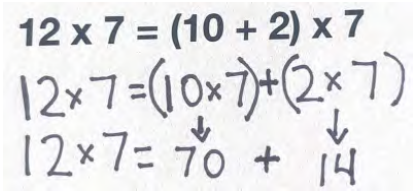
We just showed on our rectangle that we decomposed the 12 rows into 10 rows plus 2 rows. Then we found the area of the two smaller rectangles by multiplying the side lengths. Let's show what we did on the equation.



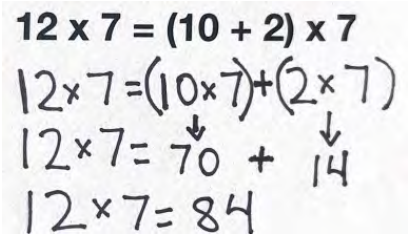
We took 12 x 7 and to find the area we multiplied 10 x 7 and then we multiplied 2 x 7. We distributed the 7 columns to the 10 rows and the 7 columns to the 2 rows.



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.



We already solved for the areas. So, what's 10 x 7? 70! And, what's 2 x 7? 14!



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.

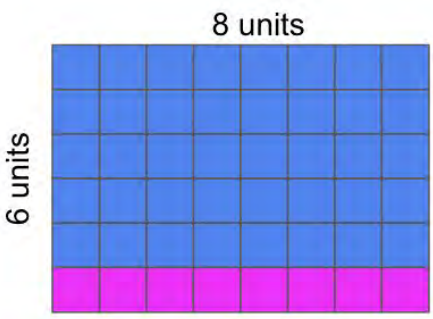
WARM WELCOME

Let's Review:

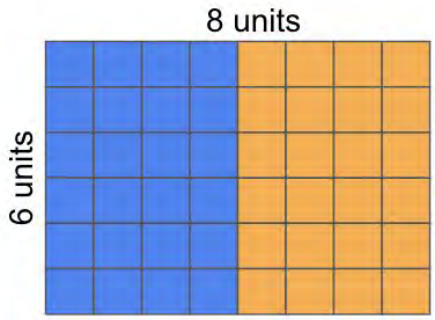
We can break apart rectangles into smaller rectangles to find the area.

A

B

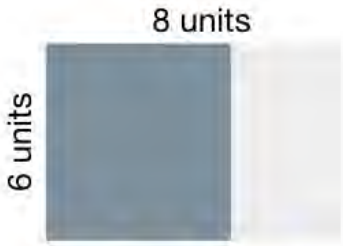


C



Let's Review:

We can use the **distributive strategy** to show how we break up rectangles.

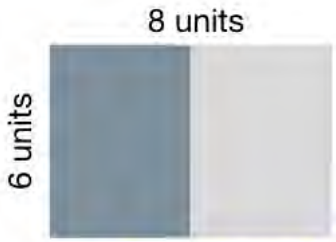


$6 \times 8 = 6 \times (5 + 3)$

$6 \times 8 = (6 \times 5) + (6 \times 3)$

$6 \times 8 = 30 + 18$

$6 \times 8 = 48$



$6 \times 8 = 6 \times (4 + 4)$

$6 \times 8 = (6 \times 4) + (6 \times 4)$

$6 \times 8 = 24 + 24$

$6 \times 8 = 48$

Today we will decompose rectangles to show the distributive strategy.

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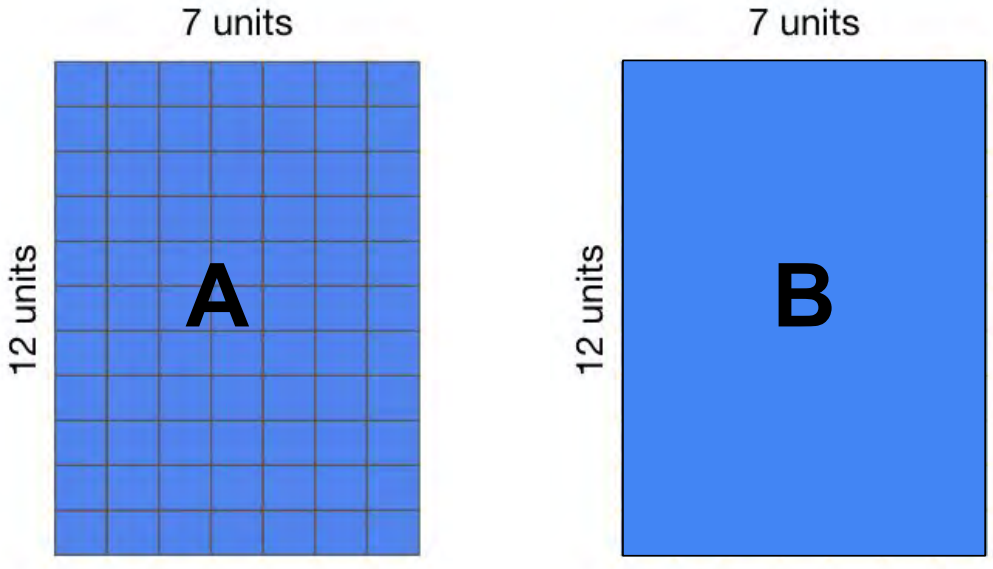
Let's Talk:

What do you notice about the equation?

6 x 8 = 6 x (5 + 3)

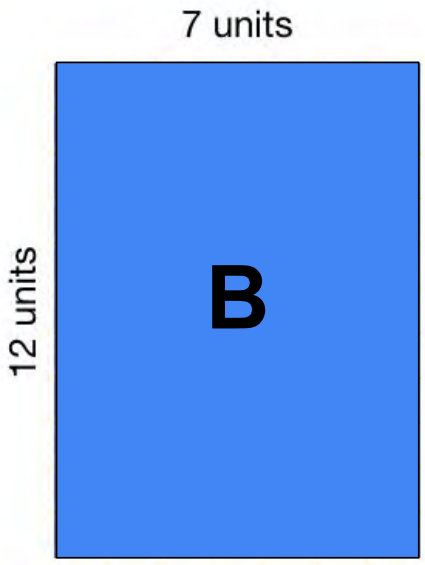
Let's Think:

How are these two rectangles the same? Different?



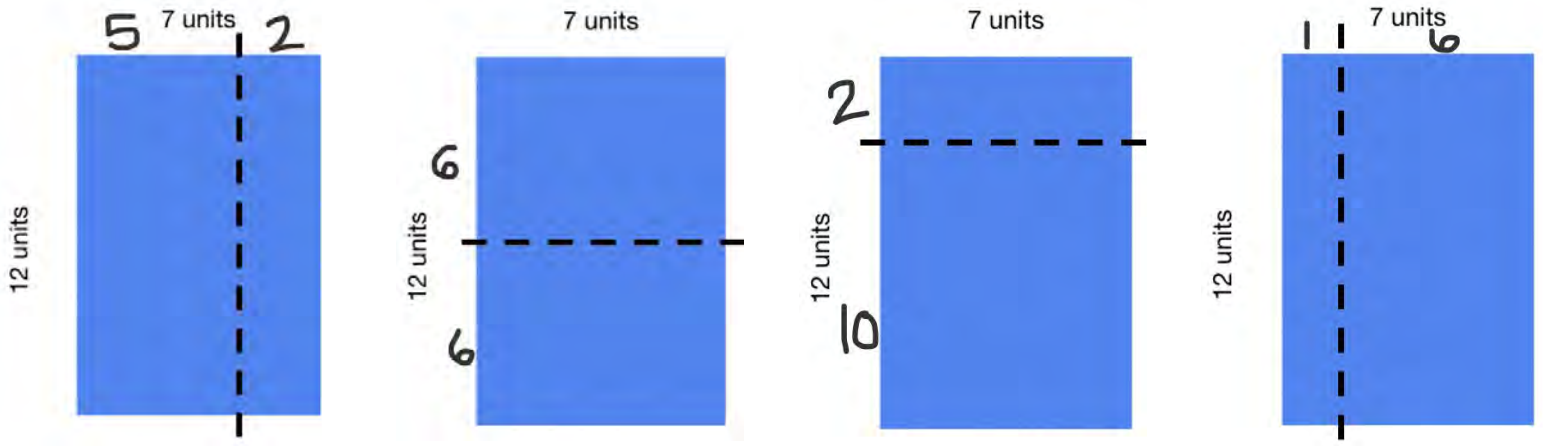
Let's Think:

What are some ways we can decompose this rectangle?



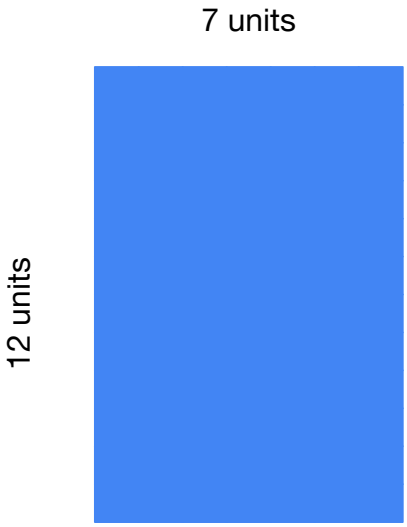
Let's Think:

We can split this rectangle LOTS of different ways.



Let's Think:

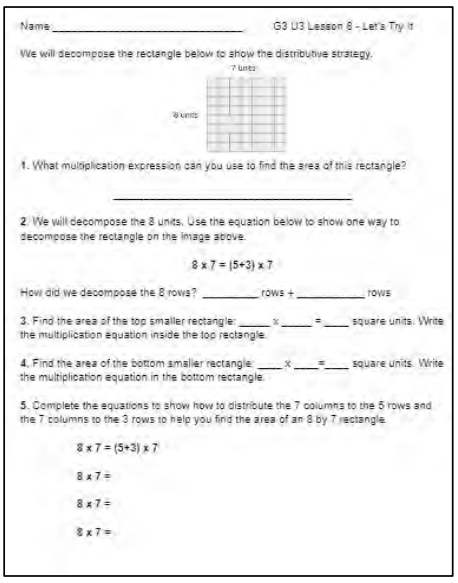
Where does the equation show how to decompose this rectangle?



12 x 7 = (10 + 2) x 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.

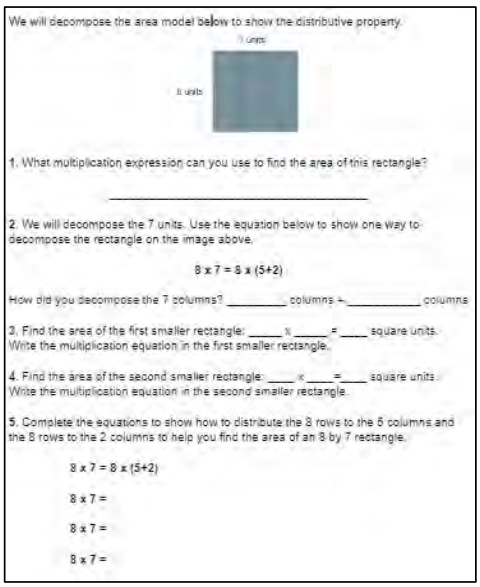
5. Complete the equations to show how to distribute the 7 columns to the 5 rows and the 7 columns to the 3 rows to help you find the area of an 8 by 7 rectangle.

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)

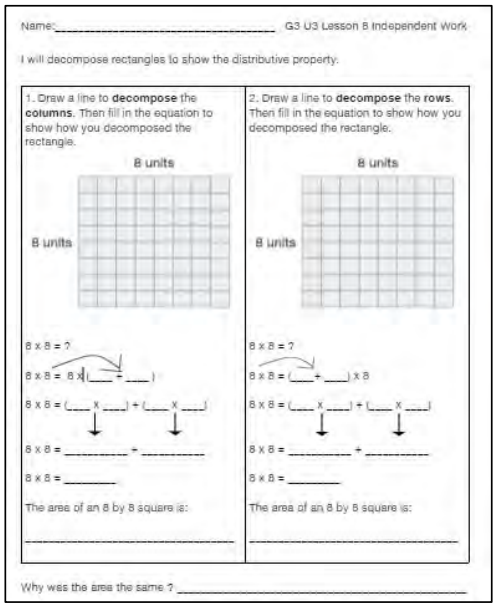
8 x 7 =

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.

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 = _____

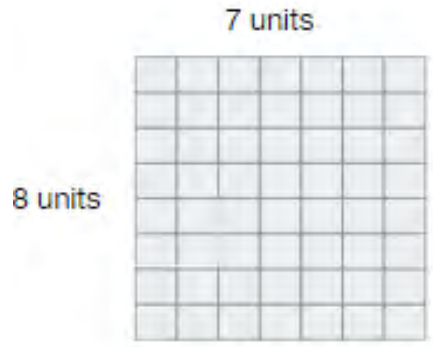
The area of an 8 by 8 square is:

_____

Why was the area the same ? _____

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 =

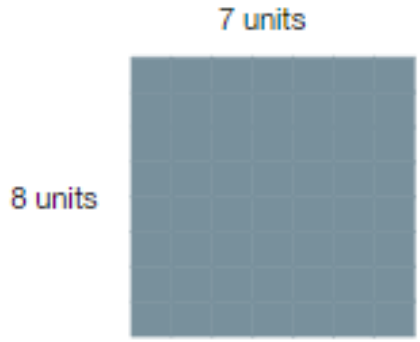
8 x 7 =

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 =

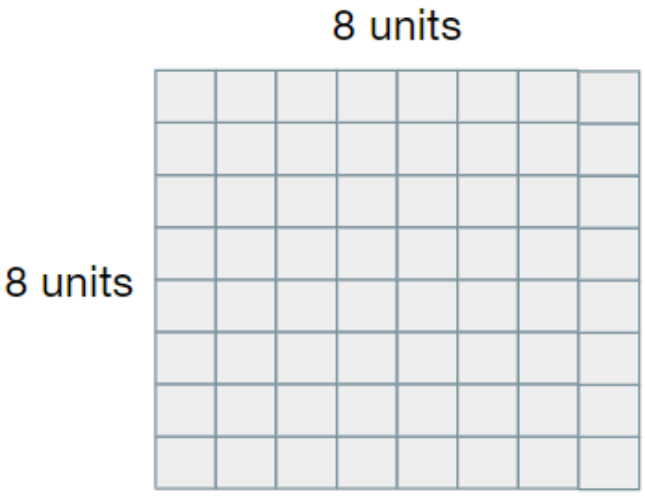
8 x 7 =

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 x 8 = ?

8 x 8 = 8 x (____ + ____)

8 x 8 = (____ x ____) + (____ x ____)

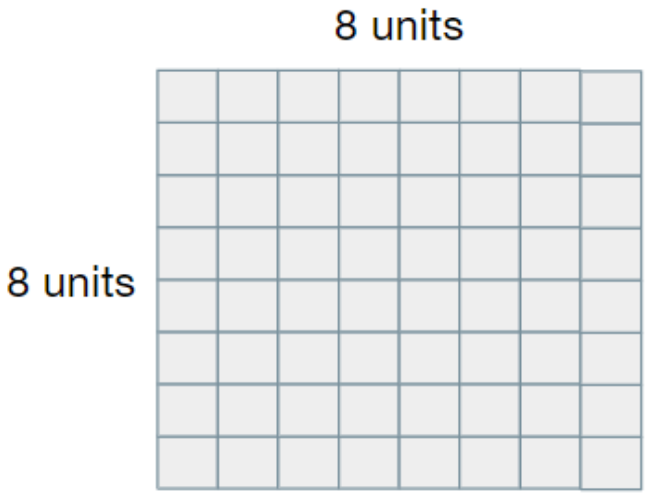
8 x 8 = _____ + _____

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 x 8 = ?

8 x 8 = (____+ ____) x 8

8 x 8 = (____ x ____) + (____ x ____)

8 x 8 = _____ + _____

8 x 8 = _____

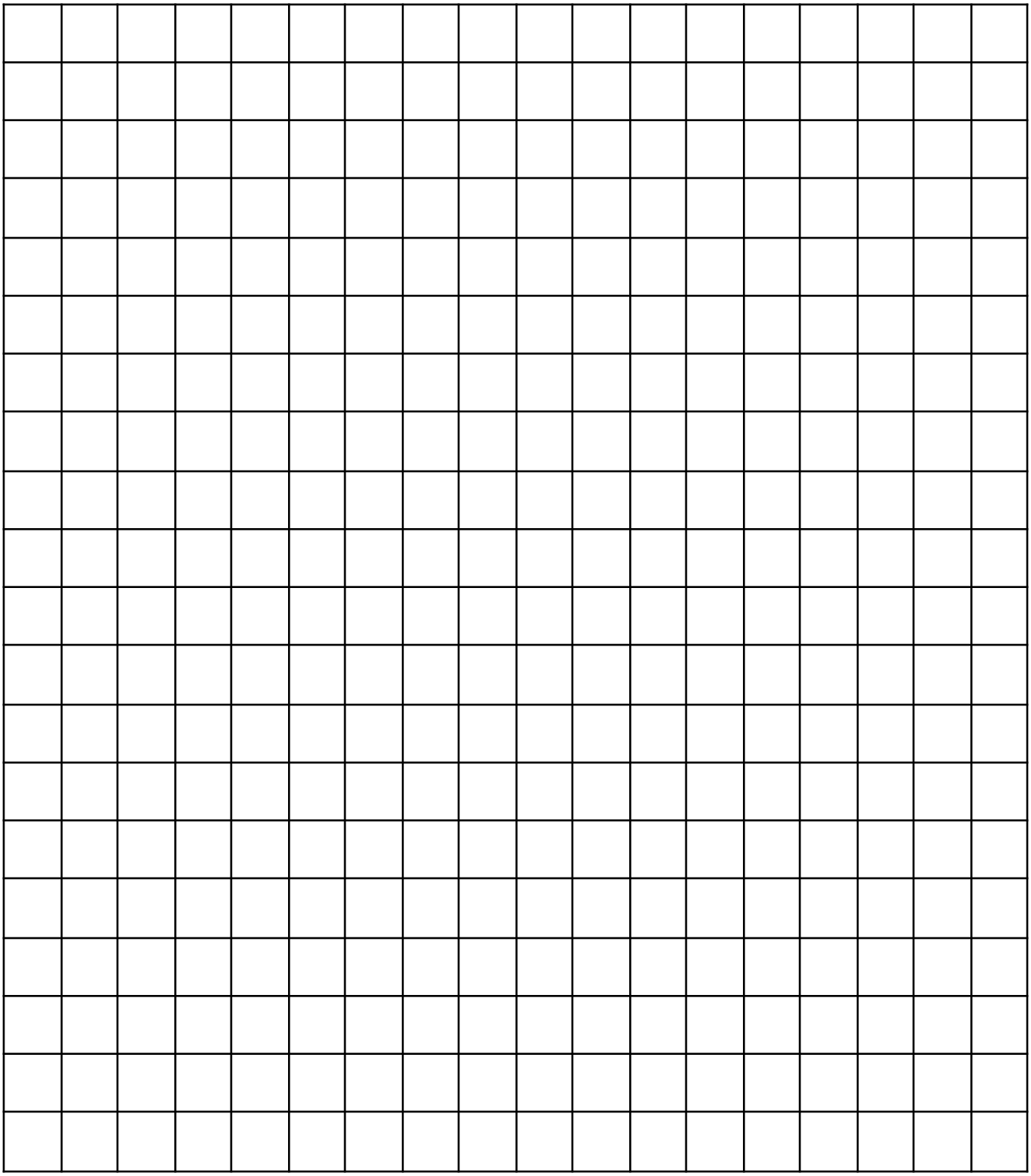
The area of an 8 by 8 square is:

_____

Why was the area the same ? _____

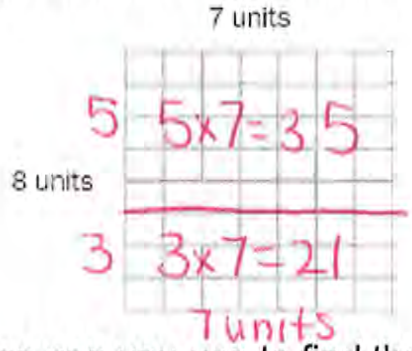
Square Inch Tiles (Grid Paper)

Square Centimeter Tiles (Grid Paper)



Name:_____ G3 U3 Lesson 8 - Let's Try It

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?

8x7

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.

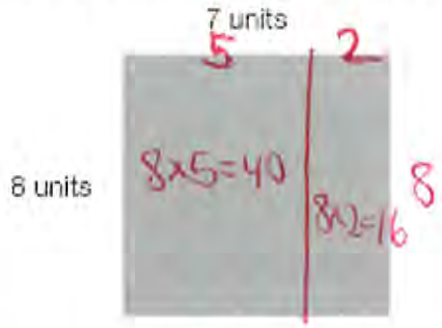
8 x 7 = (5+3) x 7

8 x 7 = (5x7)+(3x7)

8 x 7 = 35 + 21 30+20=50 50+6=56
5+1=6

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

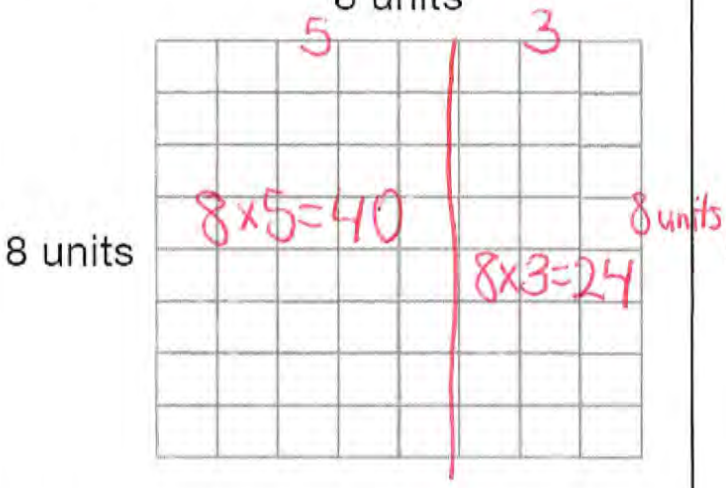
8 x 7 = 56

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 x 8 = ?

8 x 8 = 8 x (5 + 3)

8 x 8 = (8 x 5) + (8 x 3)

8 x 8 = 40 + 24

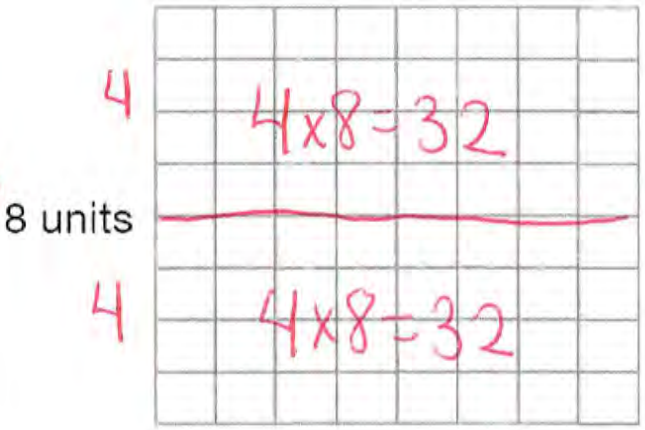
8 x 8 = 64

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 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!

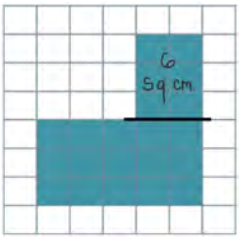
I heard so many great ideas of how we can find the area of this shape. Just like when we find the area of a rectangle, we could count the squares inside of this shape. But, we won't always have the square tiles shown on the inside, so we want to think about how else we can find area using what we already 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…

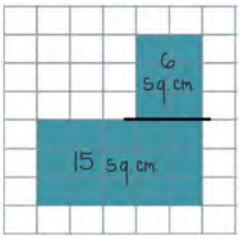
- One place I can cut is vertically, like in Example A. If I cut up and down (*trace with fingers*), then I am left with a square and a rectangle (*point*).

- 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.



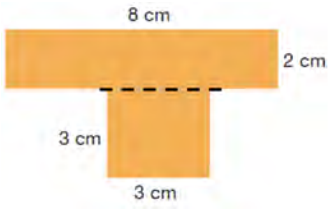
For now, let's explore Example B, where we are cutting the shape horizontally, like this (*draw line*). Now that we cut it, how many rectangles do we have? 2! Let's find the area of the top rectangle. Talk to the person next to you. What is the area? 6 square centimeters! That's right, the area is 6 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.



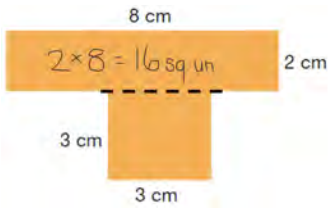
Now let's find the area of the bottom rectangle *(point)*. First, let's think about the dimensions of this rectangle. What is this vertical side length (*point*)? 3! And, let's look at the horizontal side length, this one is tricky because the top is attached to the recntalge up here (*point).* But, 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.

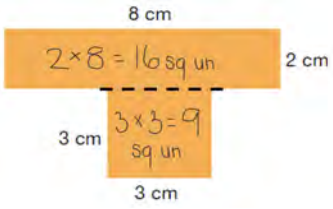
Let's Think (Slide 8): Look at this shape. What's different now? We don't see the square tiles anymore! It's an area model. Some of the side lengths are labeled. Correct. Now the image doesn't have the squares filled in and we need to imagine them. But, we can still follow the same strategy to find the 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!

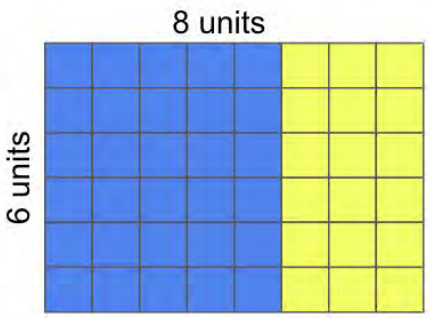
Let's Try it (Slides 9-10): Now let's work on decomposing the shapes into rectangles to find the area together! Remember, we will find smaller rectangles in the shape, find the areas of those rectangles, and then add those areas together to find the area of the whole shape! We are going to work on the first page step-by-step.

WARM WELCOME

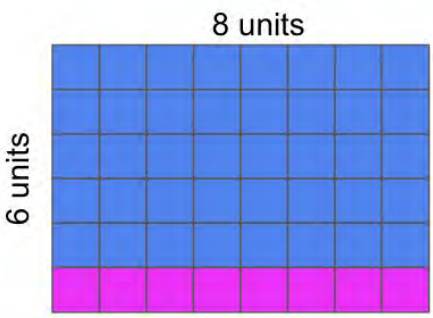
Let's Review:

We can break apart rectangles into smaller rectangles to find the area.

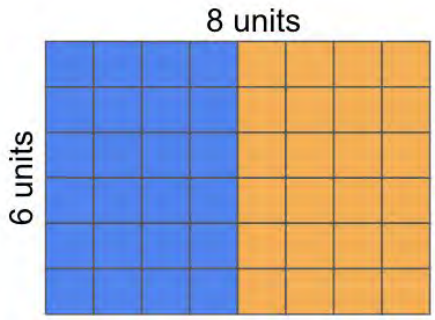
A



B

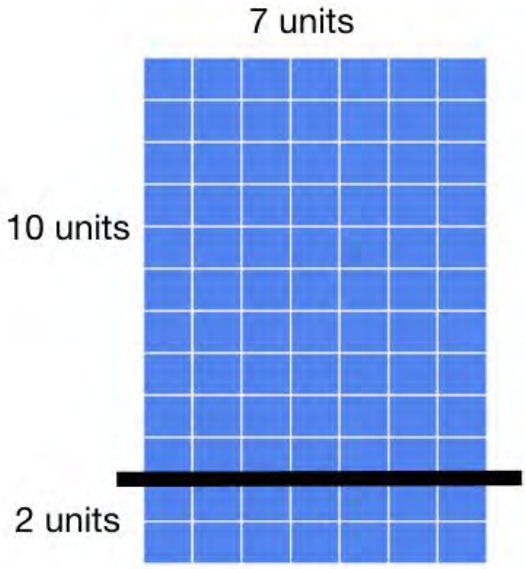


C



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.

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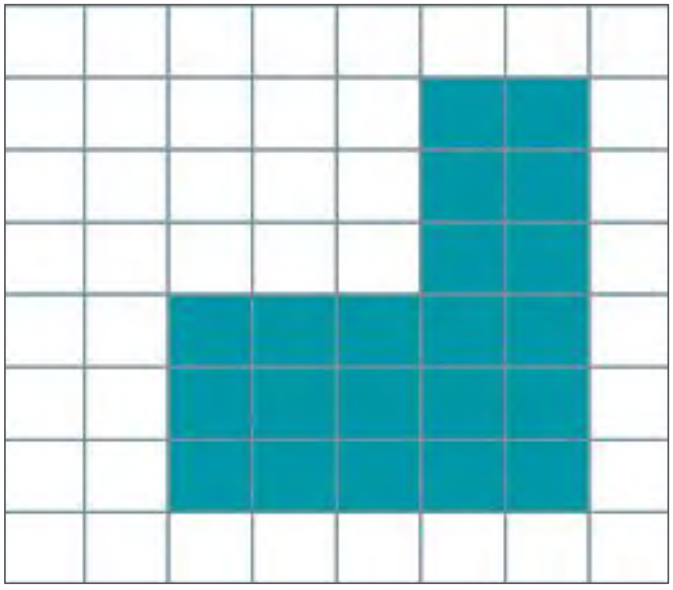
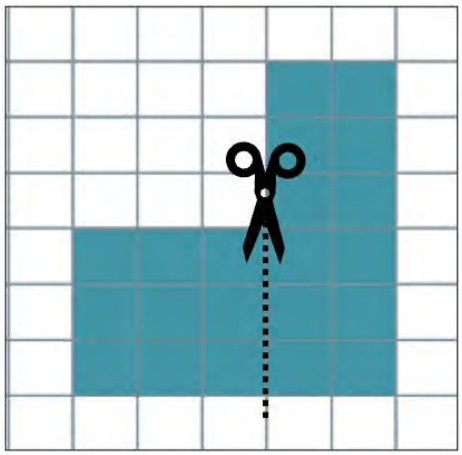
Let's Talk:

What are some ways we can find the area of this shape?

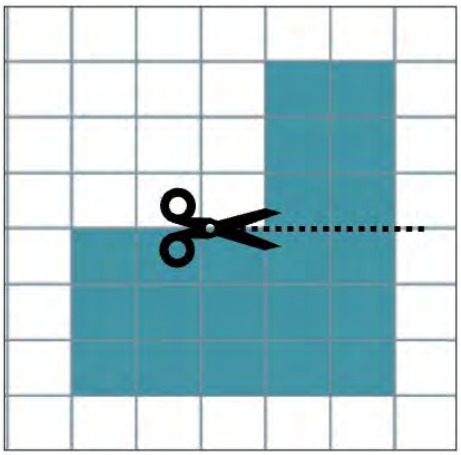


Let's Think:

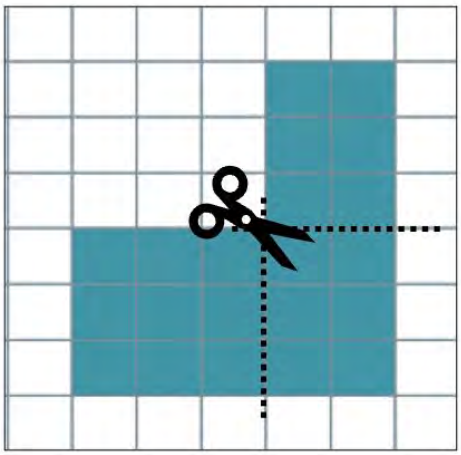
We can decompose this shape into rectangles a few different ways.



A



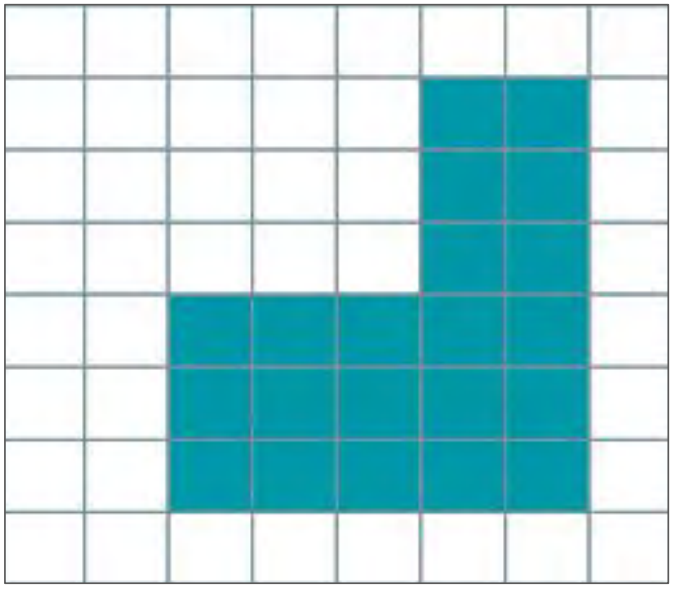
B



C

Let's Think:

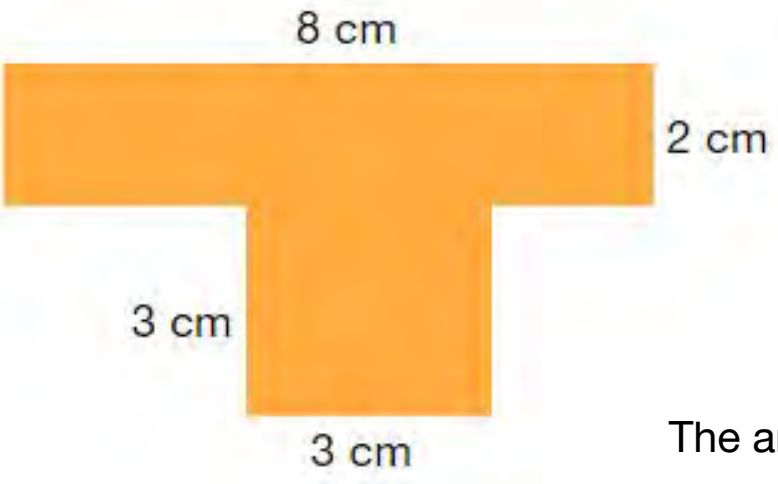
Let's decompose this shape into rectangles to find the area.



Area = _____ sq cm

Let's Think:

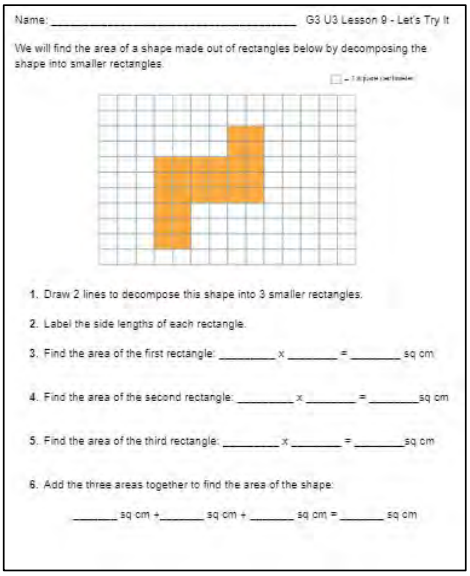
Let's decompose this shape into rectangles to find the area.



The area of this figure is _____ sq cm.

Let's Try It:

Let's explore decomposing shapes into rectangles to find the area!

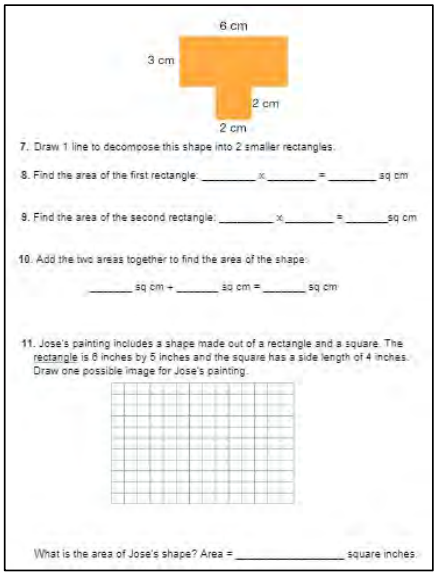


Name: _____ G3 U3 Lesson 9 - Let's Try It

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:

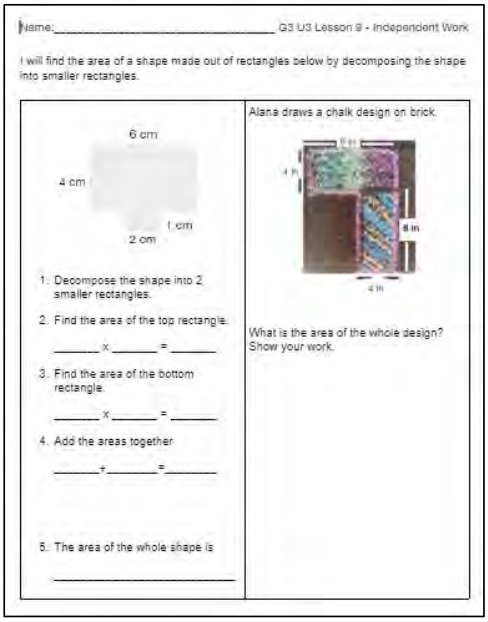
_____ sq cm + _____ sq cm = _____ sq cm

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

_____

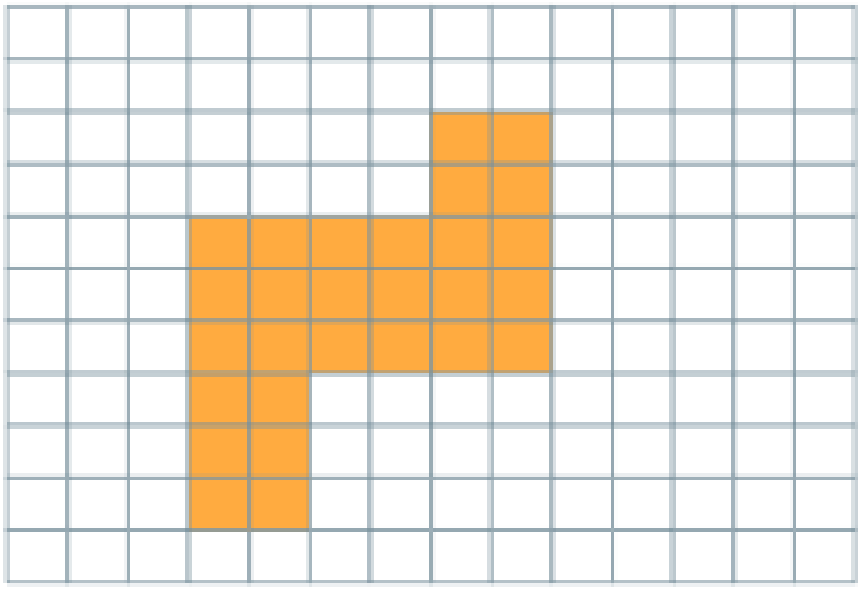
Alana draws a chalk design on brick.

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 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: _____ x _____ = _____ sq cm

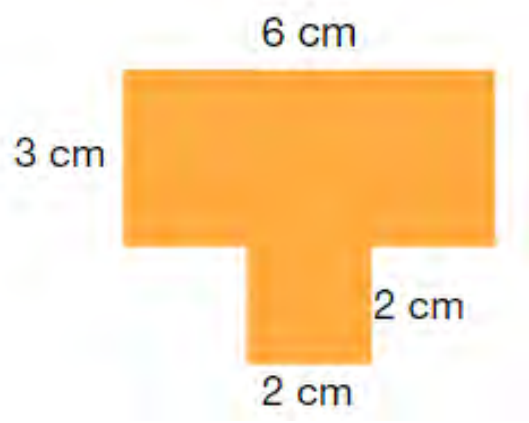
4. Find the area of the second rectangle: _____ x _____ = _____sq cm

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.

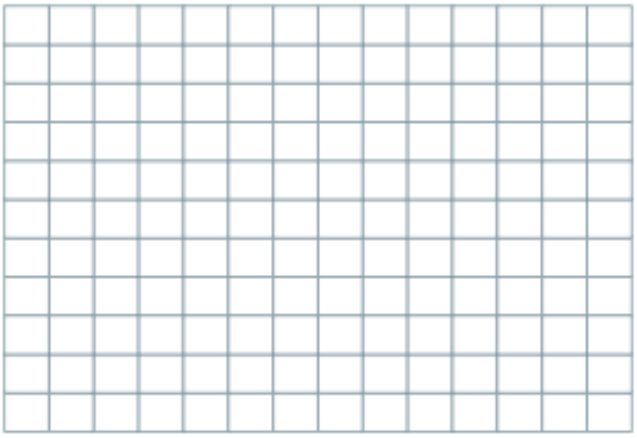
8. Find the area of the first rectangle: _____ x _____ = _____ sq cm

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

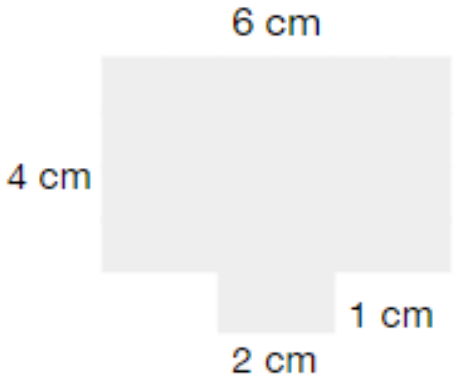
11. Jose's painting includes a shape made out of a rectangle and a square. The rectangle is 6 inches by 5 inches and the square has a side length of 4 inches. Draw one possible image for Jose's painting.



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 _____ = _____

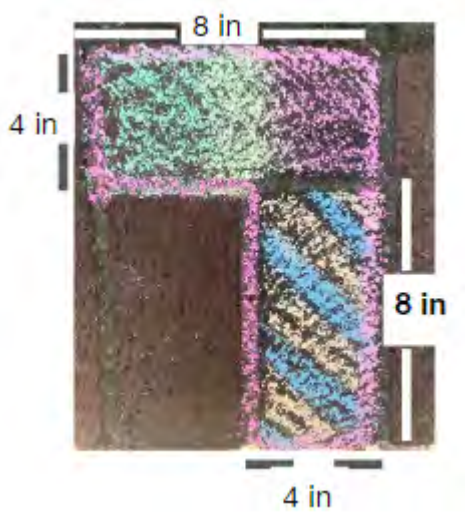
4. Add the areas together

   _____+_____=_____

5. The area of the whole shape is

   _____

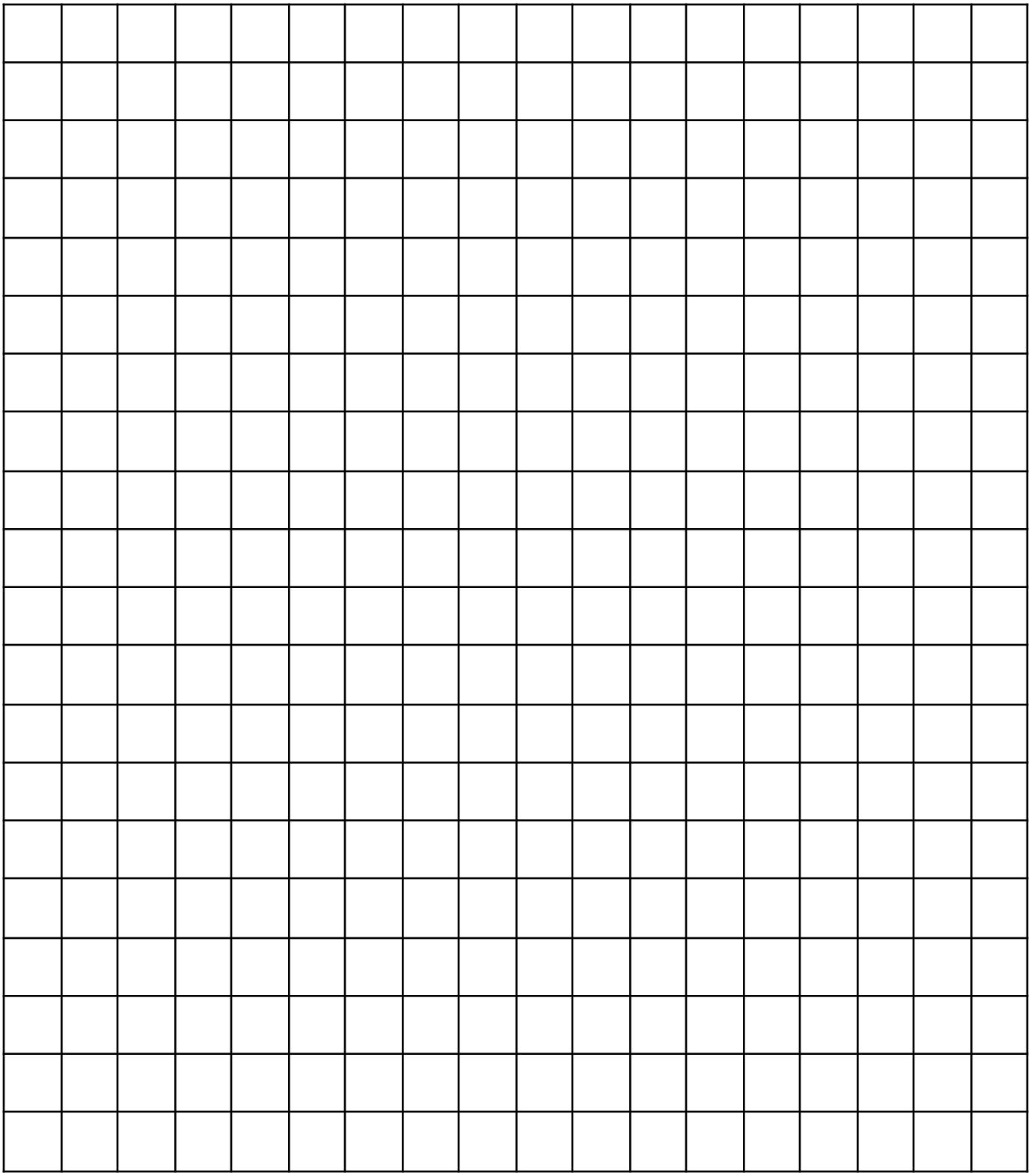
Alana draws a chalk design on brick.



What is the area of the whole design? Show your work.

Square Inch Tiles (Grid Paper)

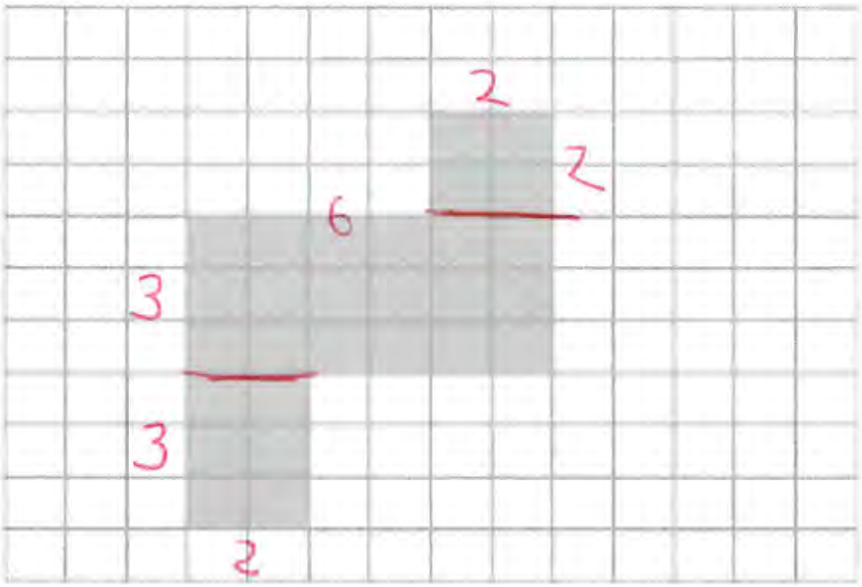
Square Centimeter Tiles (Grid Paper)



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

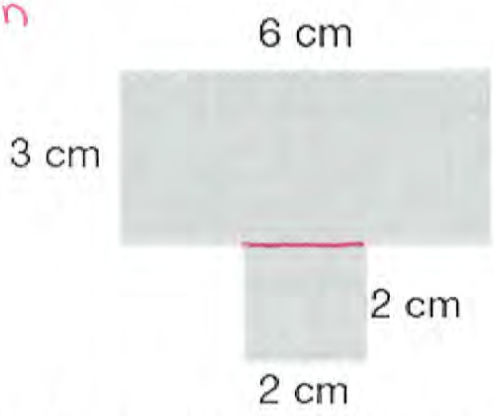
6. Add the three areas together to find the area of the shape:

4 sq cm + 18 sq cm + 6 sq cm = 28 sq cm

4+6=10

18+10=28

Notes 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

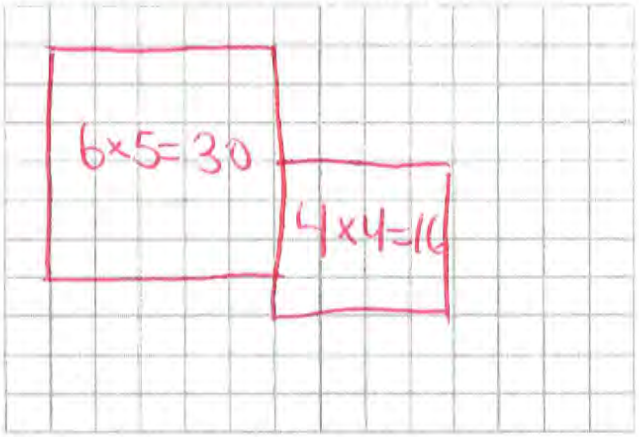
10. Add the two areas together to find the area of the shape:

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

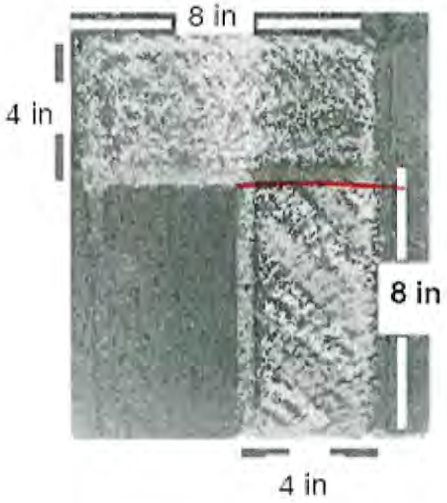
4. Add the areas together

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.

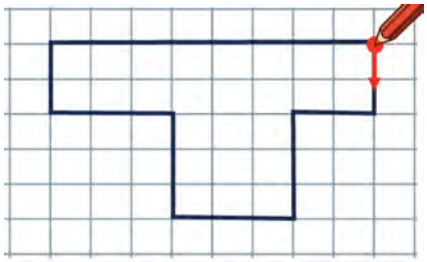
The arrows with the lines on both ends show you the distance of the side length. For example this arrow labeled 2 cm (*point),* shows us if we measured it with a ruler, or filled in the squares and measured the side length, it would be 2 cm long.

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!

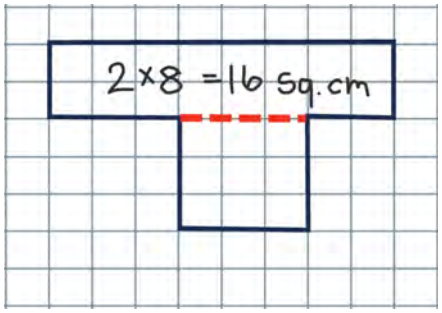
One way we can find the missing side length is to draw the whole shape on grid paper and then use the squares to find the missing length. Using grid paper to find the missing side length and area is the first strategy we will learn about today. Watch me as I draw the shape on this grid paper.



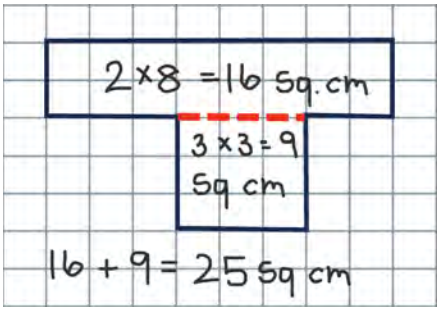
I need to start from the side that I know, and look, we see this right side is 2 cm so I draw 2 lines down.

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.)*

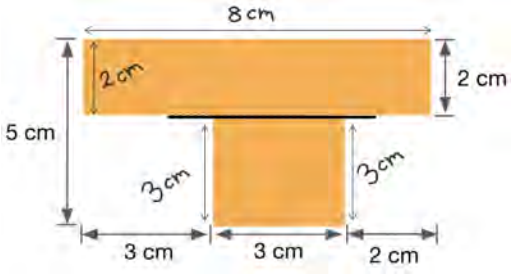


Look, drawing the figure on graph paper helped us find the side lengths, now we can find the area of both rectangles. Let's draw a line to help us split this shape into two rectangles. Let's look at the top rectangle. It's 2 cm by 8 cm, which means we have 2 groups of 8, which is 16 in all!



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.

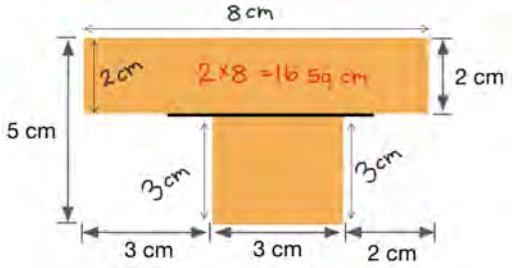
Let's Think (Slide 6): Great work! To find the missing side lengths and area of this shape you can use the grid paper to help you, but you need to be careful that you draw it correctly. There's another way to find the area of a figure with missing side lengths. Strategy #2 for finding the missing side lengths and area of this shape is to find the side lengths of the larger rectangle. Let me show you what I mean.



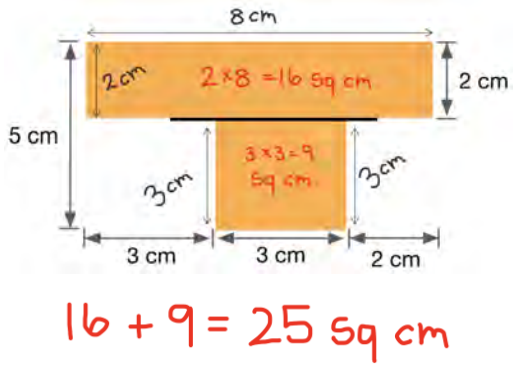
For this image, the first length I have to find is across the top (*trace).* Well look, if I imagine this is a larger rectangle (*trace your fingers around the whole 5 by 8 rectangle)* then I know this side is 5 cm and this side across the top, is the same as this whole length across the bottom (*trace 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!

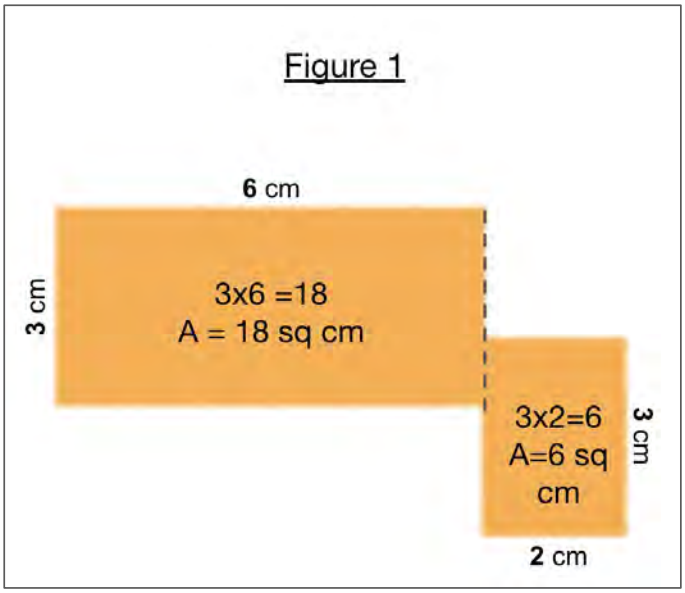
Remember, one strategy is to use the grid paper. The other strategy is to fill in the side lengths of the larger rectangle and use your knowledge of opposite sides of rectangles to help you solve for the missing side lengths. Once we know the sides lengths, we can find the area of the smaller rectangles, 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.



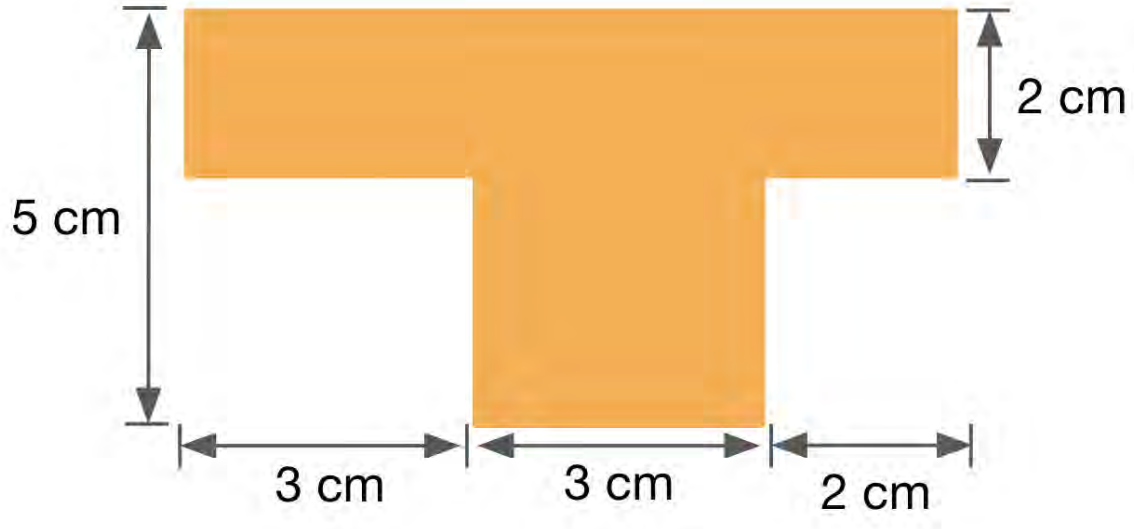
18 sq cm + 6 sq cm = 24 sq cm

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?



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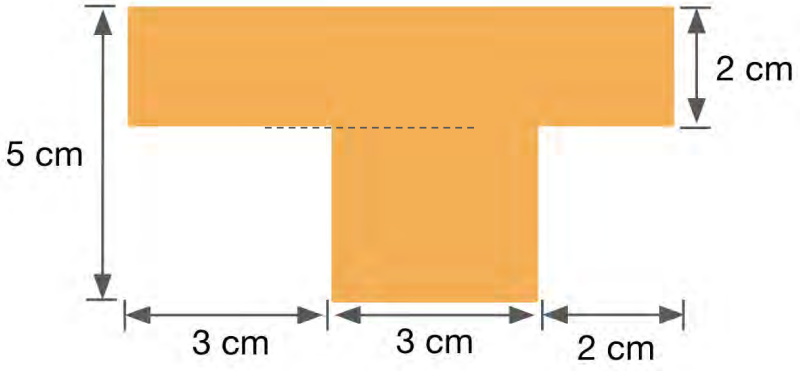
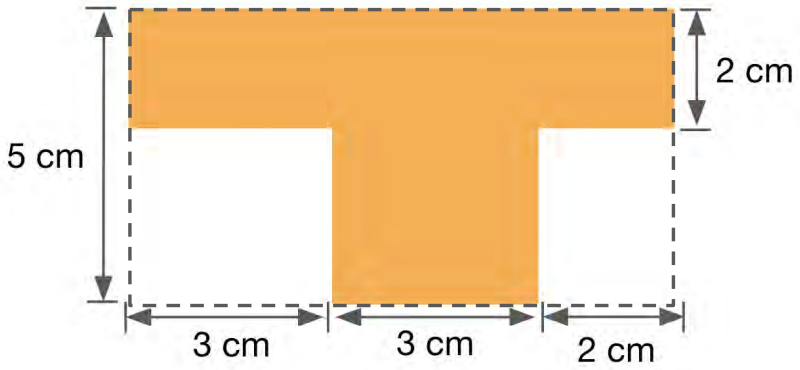
Let's Think:

Strategy 1: Draw the shape on grid paper



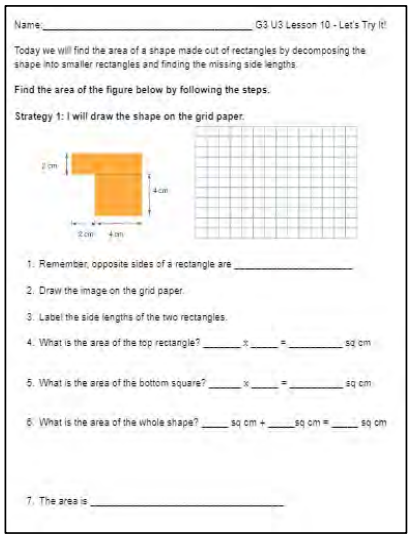
Let's Think:

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.

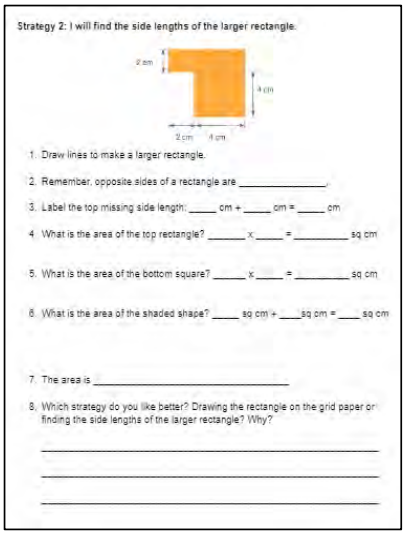
Strategy 1: I will draw the shape on the grid paper.

2 cm

4 cm

2 cm 4 cm

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.

2 cm

4 cm

2 cm 4 cm

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?

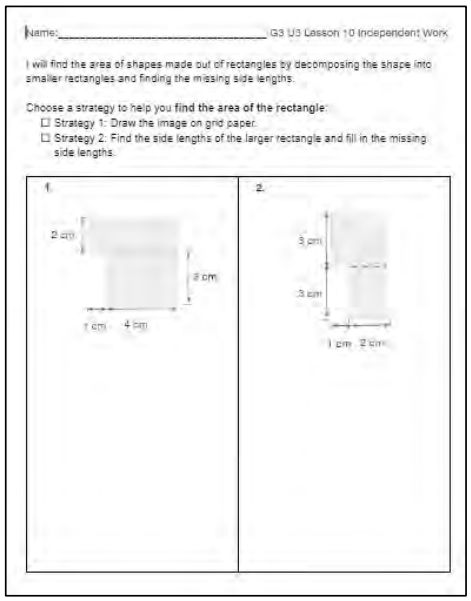
_____

_____

_____

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 cm

3 cm

1 cm 4 cm

2.

5 cm

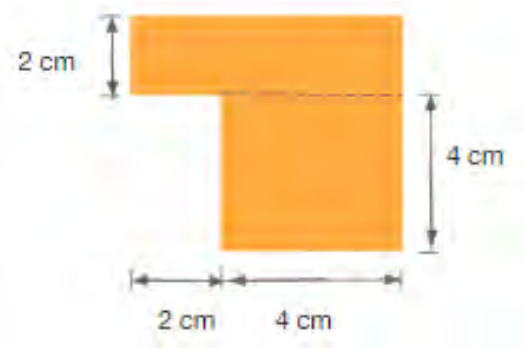
3 cm

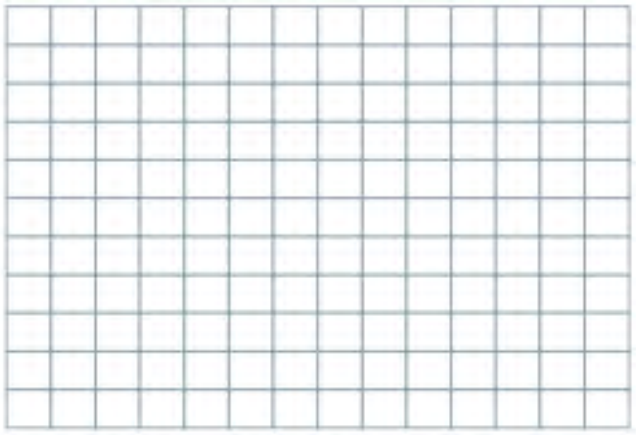
1 cm 2 cm

Name:_____ G3 U3 Lesson 10 - Let's Try It

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.

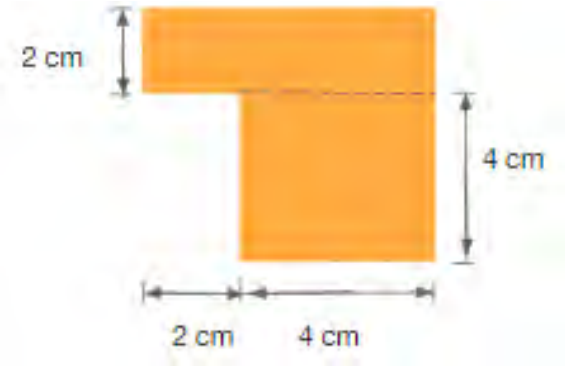
4. What is the area of the top rectangle? _____ x _____ = _____ sq cm

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?

_____

_____

_____

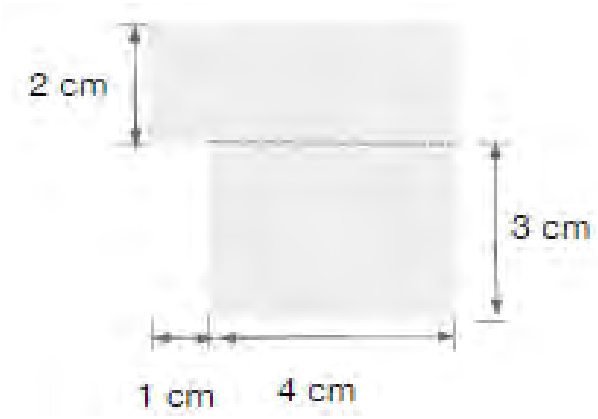
Name:_____ G3 U3 Lesson 10 - Independent Work

I will find the area of shapes made out of rectangles by decomposing the shape into smaller rectangles and finding the missing side lengths.

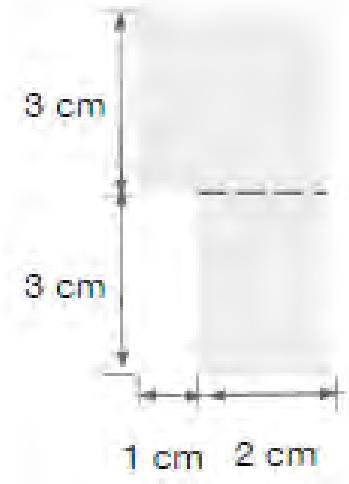
Choose a strategy to help you **find the area of the rectangle**:

- ☐ 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.

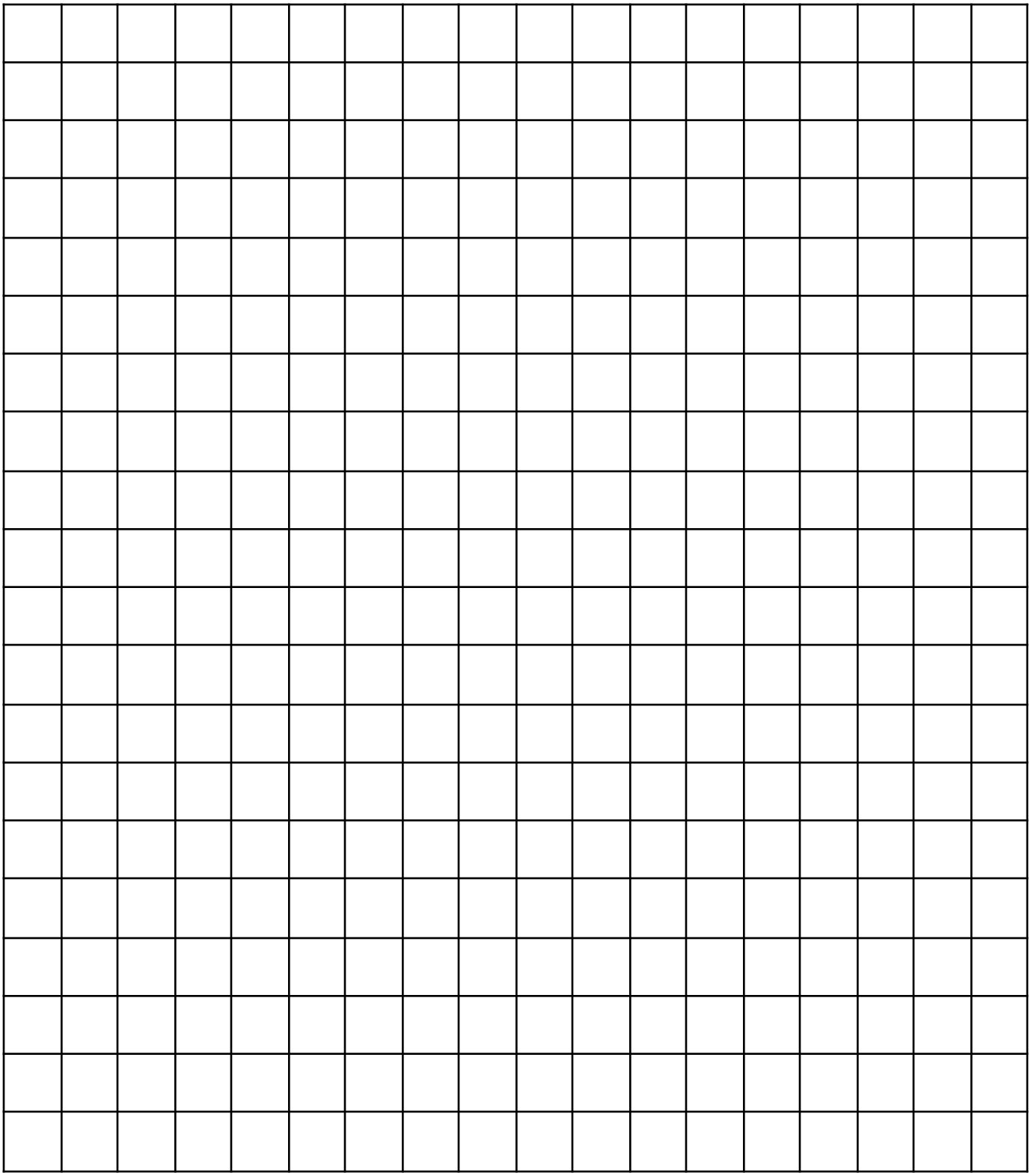


2.



Square Inch Tiles (Grid Paper)

Square Centimeter Tiles (Grid Paper)

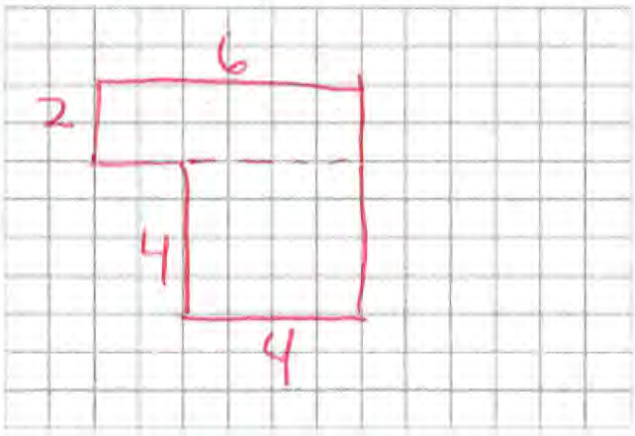


Name:_____ G3 U3 Lesson 10 - Let's Try It!

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.



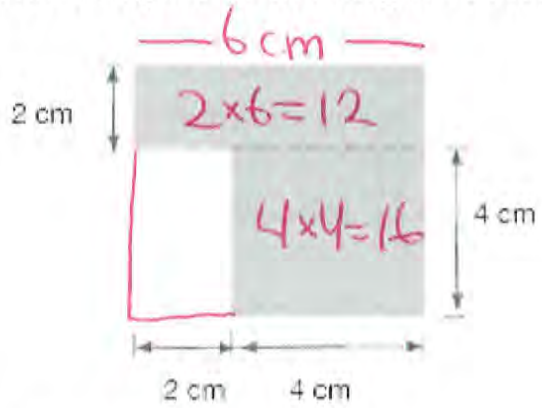
1. Remember, opposite sides of a rectangle are equal.
2. Draw the image on the grid paper.
3. Label the side lengths of the two rectangles.
4. What is the area of the top rectangle? 2 x 6 = 12 sq cm
5. What is the area of the bottom square? 4 x 4 = 16 sq cm
6. What is the area of the whole shape? 12 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...

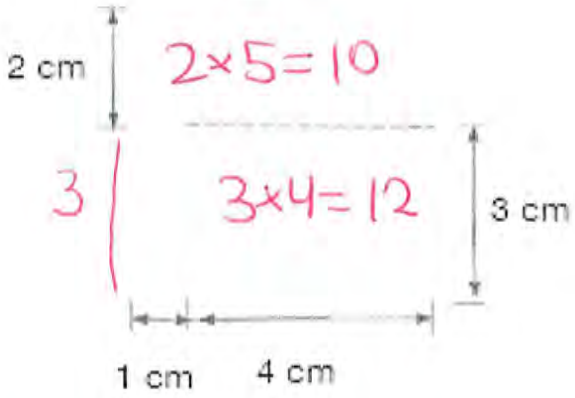
Name:_____ G3 U3 Lesson 10 Independent Work

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.



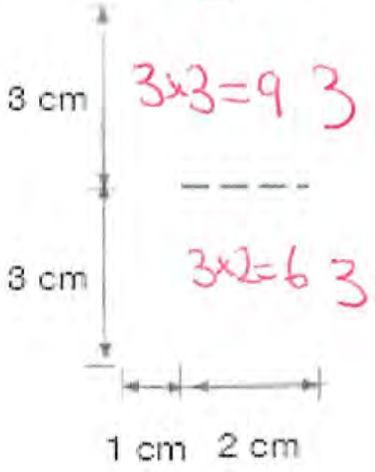
Area top rectangle: 10

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 sq cm

G3 U3 Lesson 11

Solve word problems with area

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!

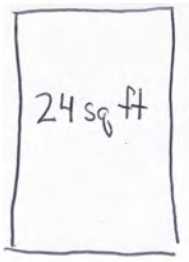
- First we will read the problem. We will imagine what's happening in the problem and make a movie in our minds.
- Then we will draw a math picture or math model. This will help us think about how to solve it.
- Then we will write an equation to help us solve. We will solve and then we will write a complete 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.)*

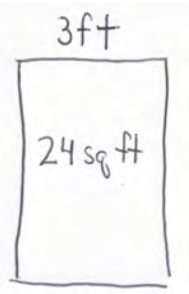
So, what do we know?

- 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.

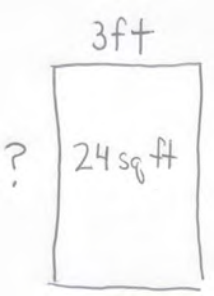
Great! I heard you say we know the glass is a rectangle. We know the area, or the amount of space the glass rectangle takes up is 24 square feet. We know one side length is 3 feet! What do we need to know or what are we trying to figure out? The length of the other side.



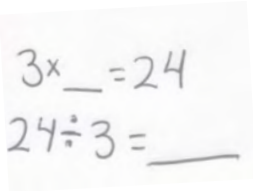
Now let's draw a math picture or a math model to help us understand the problem. We have a piece of glass that is a rectangle. We know the area of the rectangle is 24 square feet. Where can we add that in our model? Write 24 square feet inside the rectangle since that means how much space it takes up. 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.



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.

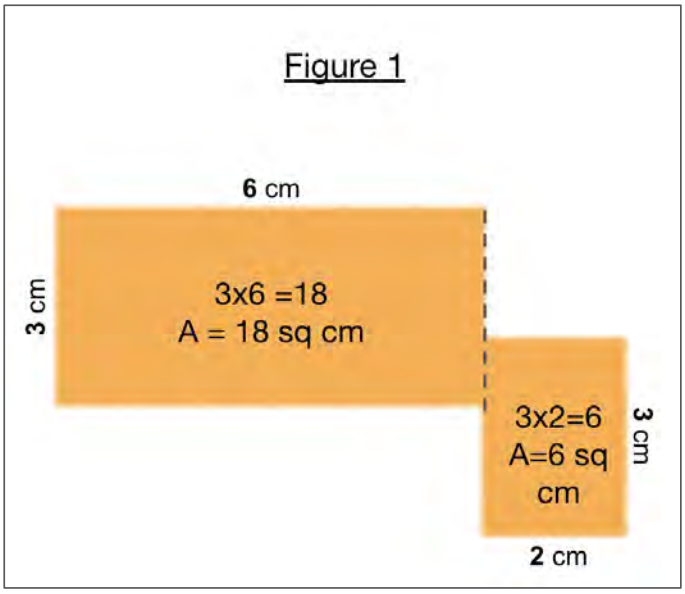
The very last thing we need to do is make sure our answer is reasonable, or makes sense. In our model we have a rectangle with a length of 3 feet and a length of 8, and an area that's 24 sq ft. Hmm, well 3x8 is 24, let's double check (*do the math to check*). So, yes that answer sounds reasonable!

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:

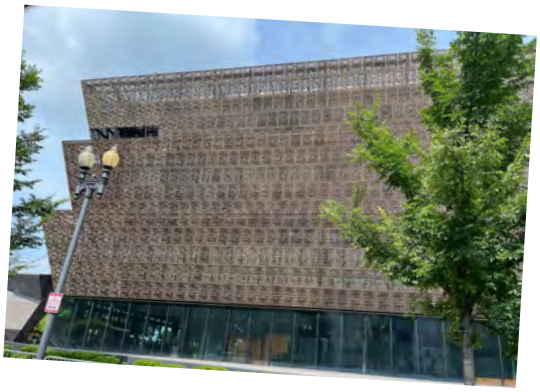
We can break apart shapes into smaller rectangles to find the area.



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?

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

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?

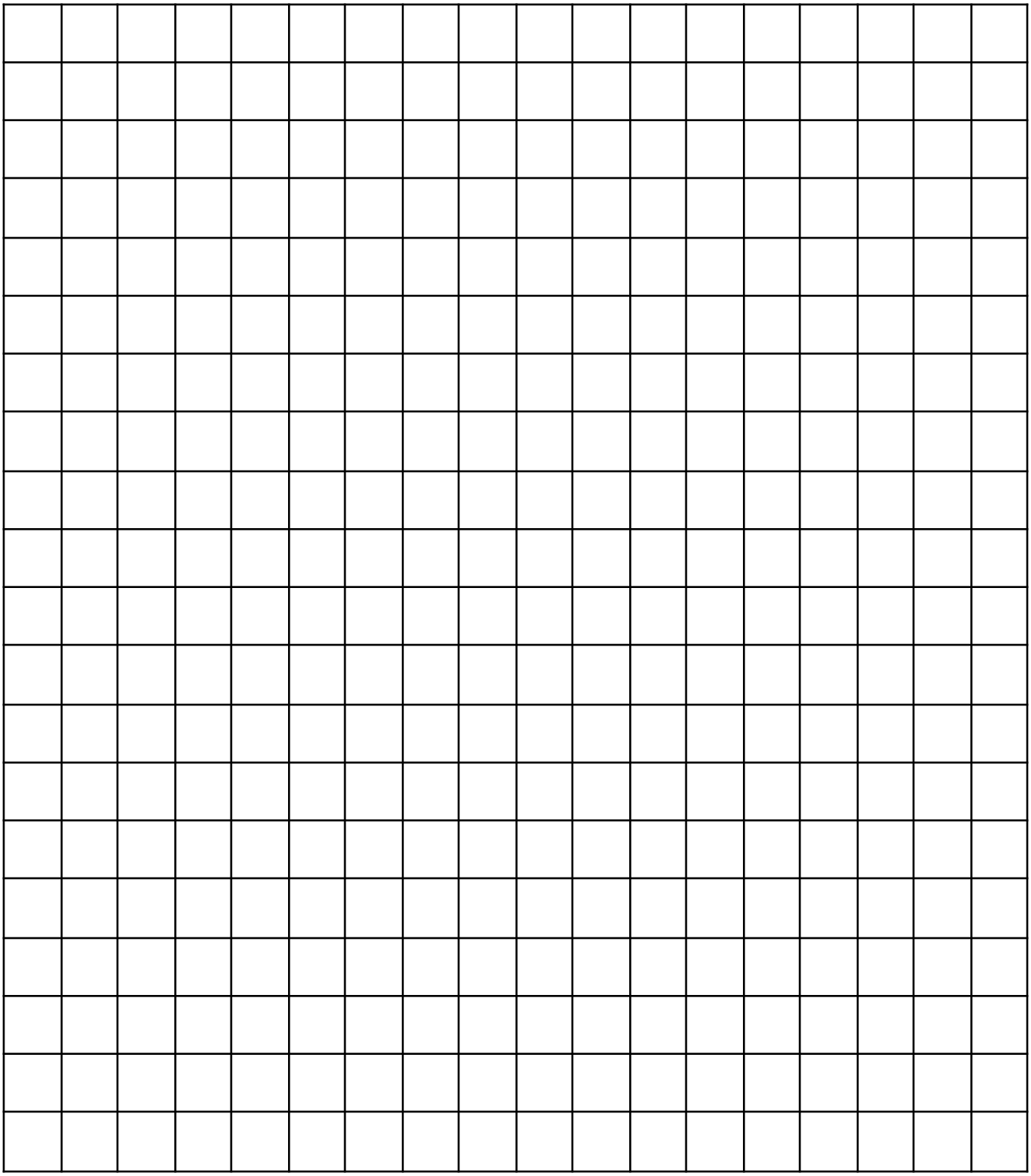
2. What is the area of the shape made by the black lines? There are 6 tiles inside the shape.

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)

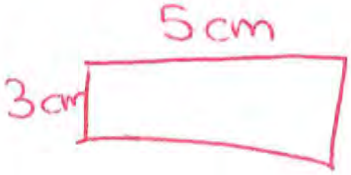


Name:_____ G3 U3 Lesson 11 Independent Work

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?

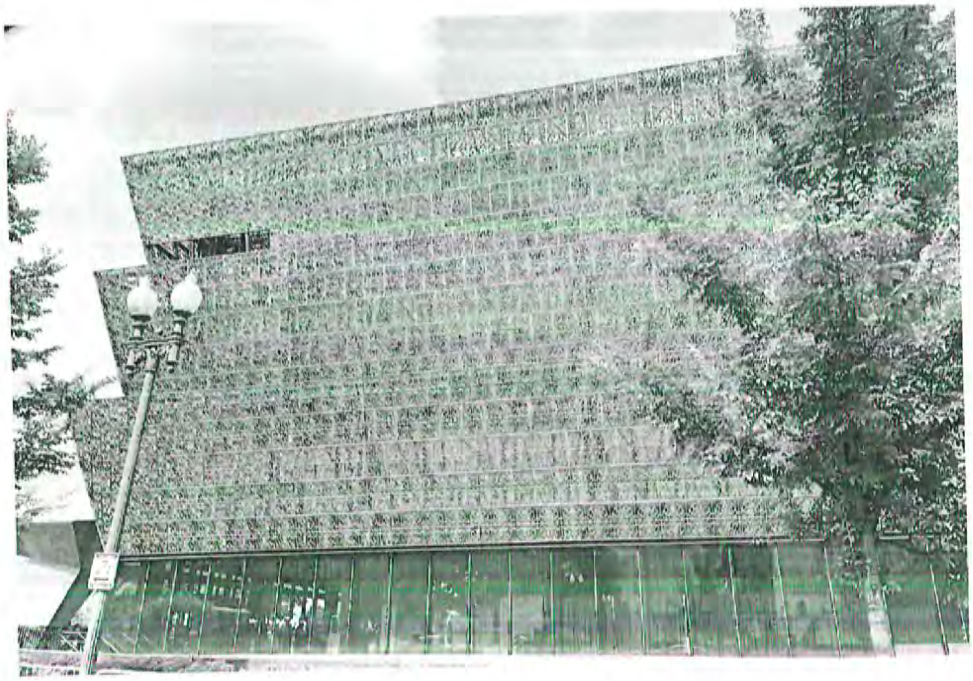


3 rows of 5
3 x 5 = 15
Area of 1 tile = 15 sq cm

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?

X A. 4 feet by 6 feet

4x6=24

X B. 3 feet by 6 feet

3x6=18

C. 4 feet by 5 feet

4x5=20

X C. 5 feet by 3 feet

5x3=18

Note: Students can use grid paper to help them find the areas.