

## Unit 2, Lesson 3

3-4



### Literature Vocabulary

savanna  
habitat  
weather  
lightning  
burrows  
shrubs

### Math Vocabulary

factors  
products  
multiplication  
division  
fact family  
area model  
array model

### TV Materials:

- Student “Area Squares” BLM from Lesson 2
- 60 base ten units per student
- Metric ruler 1 per student
- **BLM** cm Graph Paper

### Time Clue

**BB** = 1 minutes  
**CI** = 26 minutes  
**AC** = 1 minute

**ELPS** (*English Language Proficiency Standards*)  
1D, 1G, 2D, 2I, 3C, 3E, 3I

**CCRS** (*College and Career Readiness Standards*)

### Math

I.B.1; I.D.1; VIII.A.1,2,3,4,5;  
I.B.2; IX.A.1,2,3; IA.B.1,2;  
IX.C.1; X.A.1;

### Cross-Disciplinary

I.C.1,2,3; I.D.1,2,3,4; I.E.1,2

### Classroom Teachers

Please circulate the room to see that students are not having difficulty following directions.

## TV Lesson

Read objectives while pointing to the words in the math lesson objectives. After each math objective, show children what that means.

### Math Objectives:

- Model factors and products using area and array models.
- Represent multiplication and division situations in picture, word, and number form.
- Use patterns and relationships to develop strategies to remember basic multiplication and division facts, such as fact families.

### Language Objectives:

- Use the math vocabulary during the activity.
- Discuss solution strategies.

### Building Background, Math

Let’s take a look at our word wall to see which of our math vocabulary we have already seen demonstrated in the lessons. Boys and girls, tell your teacher which words we have already used in our lessons. (*Give them time: all but division.*)

Well, that just leaves one vocabulary word for us: division. And we are going to work with division today.

In Lesson 2 you used the area model to find the product of the number of rows in the rectangle times the number of columns in the rectangle. Let’s take a look at the area poster that we did together – 3 cm by 5 cm.

(*Remind students of the two rectangle dimensions, and of the multiplication number sentence that represents each.*) And we wrote on our record sheet that the factor, factor, product of each of these rectangles is 3, 5, 15.

**PIRATE:** Yes, because the rectangles didn’t change size. You just turned, or rotated the second one so it was tall and skinny instead of short and fat.

**TEACHER:** Just as these two rectangles are related, so are the number sentences. They are part of a family, a **fact family**, and we’re going to find two more members of that family today.

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### TV Lesson - continued

#### Comprehensible Input

We can use these rectangles, the area model to find all sorts of information. We know that we can find the AREA, or how many squares it takes to fill up the inside of the shape, when we know the width and the length.

But we can also find a missing side measurement if we know the total area and the measure of the other side.

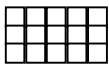
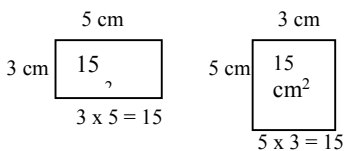
Let's try one.

Suppose we know that the area is 15. Let's use our base ten units to represent our area. Take your rulers and measure one face of the base ten cube. (*You do so, too.*) What does the face measure?

**PIRATE:** Oh, it's one cm by one cm.

**TEACHER:** Yes, it is. These base ten cubes are great for measuring area as long as we think about the top face that is facing us. So this becomes our unit of measure – the square on the top of this cube.

(*Put **one cube** on the construction paper under the 3 x 5 rectangle. You'll ultimately need space above the area model you're going to create to write the division number sentence. See model for ultimate placement.*)



Let's say that we do know the area is  $15 \text{ cm}^2$ , and we know that one side is 5 cm. We also know that the edge of our cube measures one cm, so we can count over enough using our base ten block five cm. (*Count from your one block over to a total of five, showing that you are using the edge to measure, and build the top row.*)

**PIRATE:** Oh, that's going to be easy. We know how to skip count by fives! We just keep building till we reach 15!

**TEACHER:** Right, Capt. Portio! We have built a rectangle now that is one cm wide and five cm long (*trace both measures with your finger or on the Smart Board*). What is the area of this rectangle? Tell your teacher, boys and girls (*slight pause*). The area is  $5 \text{ cm}^2$ . We're not to  $15 \text{ cm}^2$  yet, so let's keep building.

Build another row of base ten units under this one (*do so and have students do so*). What are the dimensions of our rectangle now? (*pause*)

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### TV Lesson - continued

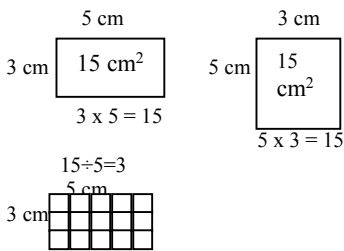


**PIRATE:** I see, this is a two cm by five cm, and the area is 10 cm<sup>2</sup>.

**TEACHER:** Right, and we don't have our area of 15 cm<sup>2</sup> yet, do we? Build another row, and see what the dimension and the area are then (*pause*).

**PIRATE:** The area is 15 cm<sup>2</sup>. We did it! And now we know the measurement of the missing side. We built it – the missing measure is one cm, two cm, three cm long (*highlight the cm as you count*).

**TEACHER:** Let's label our area model to show what we did. First we knew the area was 15 cm<sup>2</sup> and that the one side was five cm long (*label the five cm side*).



We built our area model until we had all 15 square faces facing up at us, and we counted the cm on the missing measure side and found there were 3 cm (*label*).

We just modeled a division problem. We took 15 cubes, divided them into groups of five, and found that we had three groups. Our division number sentence is  $15 \div 5 = 3$ . (*Write this above the base ten model.*)

**PIRATE:** And there are those two factors and the product again, three, five, 15.


**TEACHER:** Right, Capt. Portio – this is a related fact. This is another part of the three, five, 15 multiplication / division fact family.

**PIRATE:** Then there must be one more. Can we find it?

**TEACHER:** Sure – what is the area that we know? (*pause*) 15 cm<sup>2</sup>, and this time, we'll have the information for the three cm side.

(*Work that one just as you did for the first one, only a little faster. Capt. Portio might not participate as much, but be sure you ask the students to conjecture as you go about what to do.*)

**We now have our three, five, 15 fact family. Let's write those number sentence representations on the board (*do so*).**

<p><b>SMART BOARD</b></p> <p><b>Classroom Teachers:</b> Your follow-up task is to complete the assignment. Students will need their other three area posters from Lesson 2.</p> <p><b>Arthimus Portio's Corner</b> <b>Lesson 3 - Measurement</b> You used an area model and an array model today in your measurement lab. Probably you talked about the way the two strategies are alike and different. Share your thoughts with us.</p>	<p><b>Unit 2, Lesson 3</b> <span style="float: right;"><b>3-4</b></span></p> <p><b>TV Lesson</b> - continued <span style="float: right;"></span></p> <p>During your follow-up lesson, you will find the division representations for the factor, factor, product fact family on the rest of your area posters.</p> <p>Practice this really well, boys and girls, because we are going to use a similar method very soon with base ten blocks to multiply and divide 2-digit numbers by 2-digit numbers!</p> <p><b>PIRATE:</b> <i>(One of your "punny" remarks and explain the task.)</i></p> <p><b>Objectives:</b> And now before we go, let's review what we have learned today! <i>(do so)</i></p>
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# 1 cm Graph Paper

