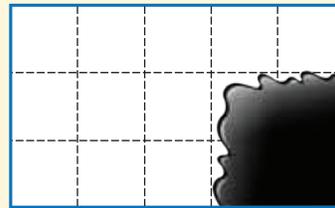


 Use What You Know

In Lesson 27, you learned to find the area of a rectangle by counting the number of square units that cover the rectangle. In this lesson you will learn how you can multiply to find the area. Take a look at this problem.

Jenny wants to find the area of the rectangle at the right. But some ink spilled on it. How can she find the area if she cannot count all of the square units?



Area of  = 1 square unit.

- How many rows are in the rectangle? _____ rows
How many square units are in each row? _____ square units
- Multiply to find the number of square units that cover the rectangle.
3 rows of 5 square units $\rightarrow 3 \times 5 =$ _____ square units
- How many columns are in the rectangle? _____ columns
How many square units are in each column? _____ square units
- Multiply to find the number of square units that cover the rectangle.
5 columns of 3 square units $\rightarrow 5 \times 3 =$ _____ square units
- How many square units long is the rectangle? _____ square units
How many square units wide is the rectangle? _____ square units
- Explain how you could find the area using the length and the width of the rectangle. _____



► Find Out More

You can measure the area of a shape by counting the number of square units that cover it. Sometimes the square units in rectangles are not shown, like in Jenny's rectangle. Other times, there are too many square units to count. There is another way to find the area of a rectangle.

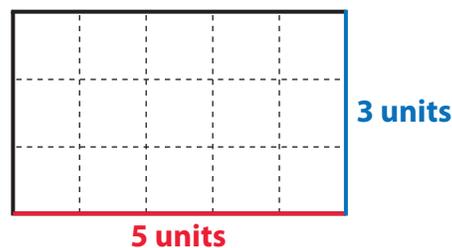
You can multiply the number of rows by the number of columns to find the number of square units in the rectangle. There are 3 rows of square units in the rectangle. There are 5 columns of square units.

3 rows \times 5 columns $\rightarrow 3 \times 5 = 15$, so there are 15 square units.

5 columns \times 3 rows $\rightarrow 5 \times 3 = 15$, so there are 15 square units.

Now think about the length and the width of Jenny's rectangle.

- The rectangle is **5 squares long**.
Each square is 1 unit long.
So, the length of the rectangle is 5 units.
- The rectangle is **3 squares wide**.
Each square is 1 unit wide.
So, the width of the rectangle is 3 units.



You can multiply the length by the width to find the area of the rectangle. It is just like multiplying the number of columns by the number of rows in an array.

$$5 \text{ units} \times 3 \text{ units} = 15 \text{ square units}$$

The area of Jenny's rectangle is 15 square units.

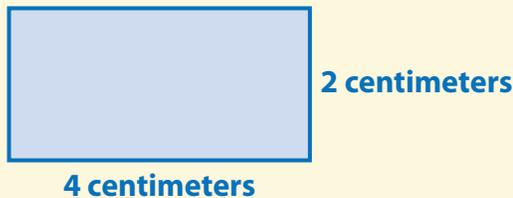
► Reflect

- 1 What are some real-life examples of objects that are rectangles and made of square tiles in rows and columns?

Learn About Multiplying to Find Area

Read the problem below. Then explore different ways to multiply to find area.

What is the area of the rectangle?



 **Picture It** You can use models to help you multiply to find area.

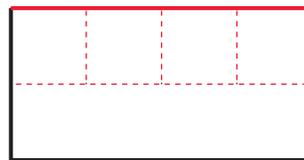
The model below shows the rectangle covered by 1-centimeter squares.



Area of  = 1 square centimeter.

 **Model It** You can also use words to help you multiply to find area.

The length of the rectangle is **4 centimeters**.
Using 1-centimeter squares,
4 squares will fill a row.



The width of the rectangle is **2 centimeters**.
Using 1-centimeter squares,
2 squares will fill a column.



Connect It Now you will solve the problem from the previous page using multiplication.

2 How many 1-centimeter squares fit along the length of the rectangle? _____

What is the length of the rectangle? _____ centimeters

3 How many 1-centimeter squares fit along the width of the rectangle? _____

What is the width of the rectangle? _____ centimeters

4 What does the problem ask you to find? _____

5 The unit of measurement for the length and width of the rectangle is centimeters. What is the unit of measurement for the area? _____

6 Complete the equation below to find the area of the rectangle.

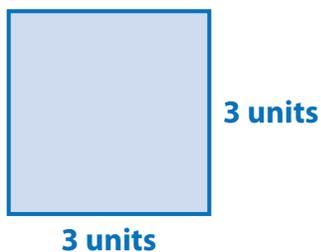
length	×	width	=	area
_____ centimeters	×	_____ centimeters	=	_____ square centimeters

7 The area of the rectangle is _____ square centimeters.

8 Explain how you multiply to find the area of a rectangle. _____

Try It Use what you just learned about multiplying to find area to solve these problems. Show your work on a separate sheet of paper.

9 What is the area of the square?



10 A rectangle has a length of 8 inches and a width of 6 inches.

What is the area of the rectangle?

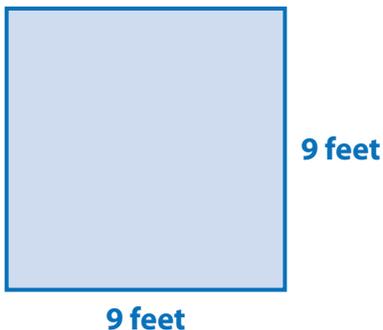
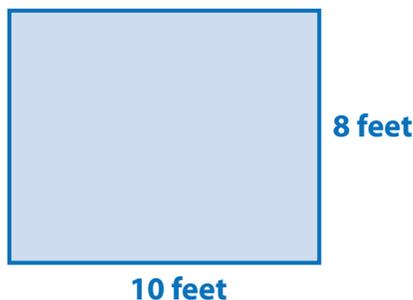
Learn About**Solving Word Problems About Area**

Read the problem below. Then explore different ways to multiply to find area in a word problem.

Tyler's bedroom is 9 feet wide and 9 feet long. Suki's bedroom is 8 feet wide and 10 feet long. Who has the bedroom with the greater area?

Picture It You can use models to help you multiply to find area.

The models below show the length and width of Tyler's and Suki's bedrooms.

Tyler's Bedroom**Suki's Bedroom**

Model It You can also use words to help you multiply to find area.

Use words to describe the measurements of each bedroom.

Tyler's room:

The length of the room is 9 feet.

The width of the room is 9 feet.

Suki's room:

The length of the room is 10 feet.

The width of the room is 8 feet.

Connect It Now you will solve the problem from the previous page using multiplication.

11 What does the problem ask you to find? _____

12 What units are used to measure the length and width of the bedrooms? _____

13 What unit should you use to record the area of each bedroom?

14 Complete the equation below to find the area of Tyler's bedroom.

length	×	width	=	area
_____ feet	×	_____ feet	=	_____ square feet

The area of the Tyler's bedroom is _____ square feet.

15 Complete the equation below to find the area of Suki's bedroom.

length	×	width	=	area
_____ feet	×	_____ feet	=	_____ square feet

The area of the Suki's bedroom is _____ square feet.

16 So, _____ has the bedroom with the greater area.

17 Explain how you know that the area of Tyler's bedroom must have the label "square feet." _____

Try It Use what you just learned about multiplying to find area to solve this problem. Show your work on a separate sheet of paper.

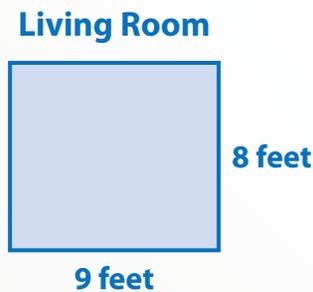
18 Fran found the area of a rectangle by multiplying 5 units \times 4 units. Draw Fran's rectangle. Label the length and width. What is the area of the rectangle?

Practice  **Multiplying to Find Area**

Study the example below. Then solve problems 19–21.

Example

Ms. Cruz is putting a carpet in the living room. The length and width of the room is shown below. How many square feet of carpet does Ms. Cruz need to cover the floor?



Look at how you could show your work using multiplication.

length	×	width	=	area
9 feet	×	8 feet	=	72 square feet

Solution 72 square feet



The student multiplies the length by the width to find the area.

 **Pair/Share**

How else could you solve this problem?

- 19** Marcia finds the area of a square. The length of one side of the square is 5 centimeters. What is the area of the square?

Show your work.



The sides of a square are all the same length.

 **Pair/Share**

How did you and your partner solve this problem?

Solution _____

- 20** Ms. Clark is building a patio that is 4 yards long and 3 yards wide. She has enough bricks to cover an area of 14 square yards. Does Ms. Clark have enough bricks to build the patio? Explain.

Show your work.

Solution _____



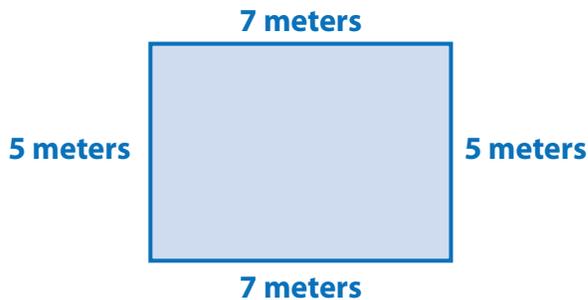
I think there are at least two different steps you need to do to solve this problem.



Pair/Share

How could you use a picture to solve this problem?

- 21** What is the area of the rectangle shown below? Circle the letter of the correct answer.



- A** 35 square meters
- B** 24 square meters
- C** 12 square meters
- D** 7 square meters

Bobby chose **B** as the correct answer. How did he get that answer?



To find the area of the rectangle, do you add or multiply?



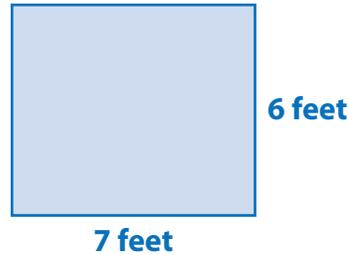
Pair/Share

Do you need the measure of each side of the rectangle labeled to solve the problem? Why or why not?

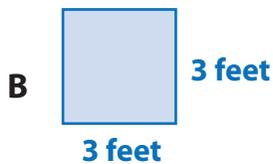
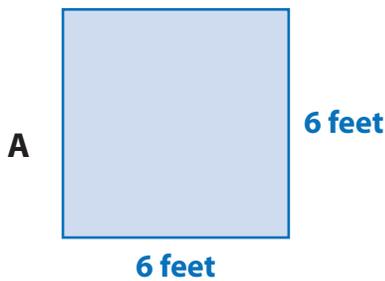
Practice  **Multiplying to Find Area****Solve the problems.**

- 1** Mr. Frank is putting tile on the bathroom wall. The model shows the length and width of the wall. How many square feet of tile does he need to cover the wall?

- A 49 square feet
- B 42 square feet
- C 26 square feet
- D 13 square feet



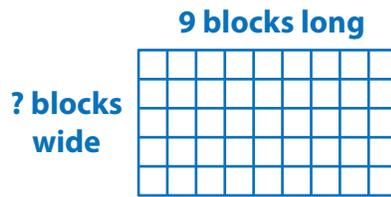
- 2** Which shape below has an area of 12 square feet?



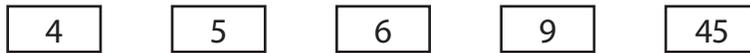
- 3** The area of a driveway is 24 square yards. What could be the length and width of the driveway? Circle the letter for all that apply.

- A Length: 8 yards, Width: 4 yards
- B Length: 4 yards, Width: 6 yards
- C Length: 3 yards, Width: 6 yards
- D Length: 6 yards, Width: 4 yards
- E Length: 8 yards, Width: 3 yards

- 4 Rita is making a quilt. It is made with 45 square blocks of fabric and is 9 blocks long.



Complete the equation below to show how many blocks wide the quilt is.
Use numbers from the ones listed below.



_____ × _____ = _____

- 5 Kayla draws the rectangle shown below.



Part A What is the area of Kayla's rectangle?

Answer _____ square units

Part B James draws a rectangle that has the same area as Kayla's rectangle, but a different length and width. What is a possible length and width for James' rectangle?

Solution _____

Self Check Go back and see what you can check off on the Self Check on page 211.