

# Area Patterns



## Objectives

Create different rectangles with the same area. Write area as length times width.

## Materials

- Algebra Tiles (1-cm squares)
- Overhead Algebra Tiles (1-cm squares)
- Algebra Master 2: Centimeter Grid
- Overhead transparency of Algebra Master 2 (optional)

## Grouping

Whole class, then small groups

## Open It Up

Use 15 tiles to make a 3-by-5 rectangle on the overhead.

**Ask:** What are the length and width of this rectangle? [Length is 5; width is 3.]

**Say:** The area is the number of squares that fill the rectangle.

**Ask:** How can you find the area of the rectangle? [Samples: Count the tiles. Multiply the length times the width.]

## Demonstrate & Discuss

Distribute the 1-cm squares to students. Provide one copy of Algebra Master 2 to each student. Have students follow along as you demonstrate the lesson using the example problem at the top of page 5.

**Say:** I'm going to use 12 tiles and make some different rectangles. My first rectangle will have a width of 1 unit. What will be the length of this rectangle? [12 units] Note that a 12-by-1 rectangle is the same as a 1-by-12 rectangle.

Repeat for the 2-by-6 and 3-by-4 rectangles.

Have students use Algebra Master 2 to draw or color the 3 different rectangles that have an area of 12.

**Ask:** What equation or number sentence can you write on the skinny rectangle to show how to find the area? [ $1 \times 12 = 12$ ] This shows that, for a rectangle, area equals length times width. What are the equations for the other two rectangles? [ $2 \times 6 = 12$ ,  $3 \times 4 = 12$ ]

Planning Your Time		
Intro & Demo	Activity	Sum It Up
15 min	20 min	5 min

## Student Activity

**Prepare ahead:** Each small group will need the 1-cm squares from a set of Algebra Tiles.

Students use square tiles to make different rectangles with the same area. On each rectangle they write an equation showing that the area equals the length times the width. For the Challenge problem, remind students that the perimeter is the sum of the four sides of a rectangle.

## Informal Assessment

Observe students to see if they are being systematic about exploring the possible rectangles. They can try side lengths of 1, 2, 3, 4, and so on.

**Ask:** Do you think you can make at least one rectangle for every whole number except 0? [Yes, a side length of 1 unit will always work.] /HYPOTHEZIZE/

## Sum It Up

**Say:** Today we made different rectangles with the same area. The rectangles had different lengths and widths.

**Ask:** How is the area of a rectangle related to its length and width? [The area is the product of the length and width.] /RECALL/

## Literature Connection

**Spaghetti and Meatballs for All!**  
**A Mathematical Story** by Marilyn Burns,  
Scholastic Press, 1997.

Materials: Algebra Tiles (1-cm squares), Algebra Master 2

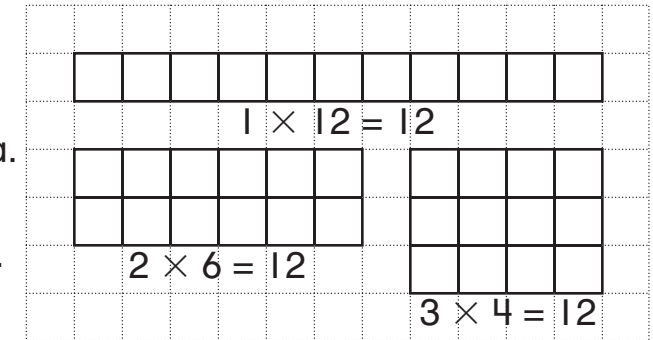
Mr. and Mrs. Comfort plan a family reunion for 32 people. Mrs. Comfort arranges 8 tables with 4 people at each table. But, the arriving guests keep changing the table arrangements. Have students use square tiles to make the table arrangements in the story and record their work on Algebra Master 2. The suggested activities at the end of the book can also be done using the small square Algebra Tiles.

Name \_\_\_\_\_

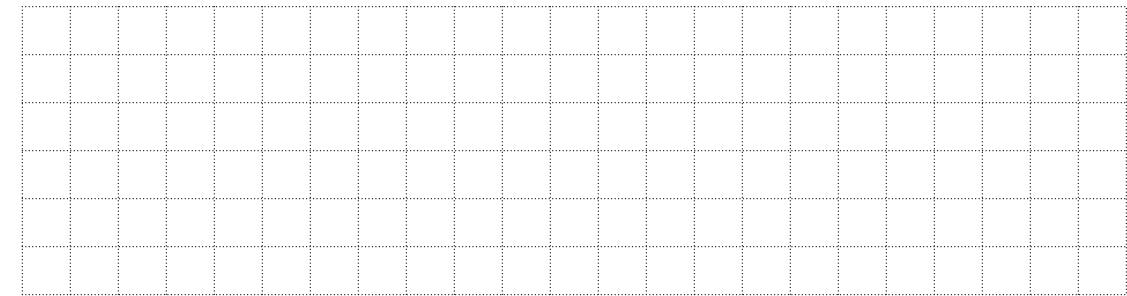
# Area Patterns

## Try This

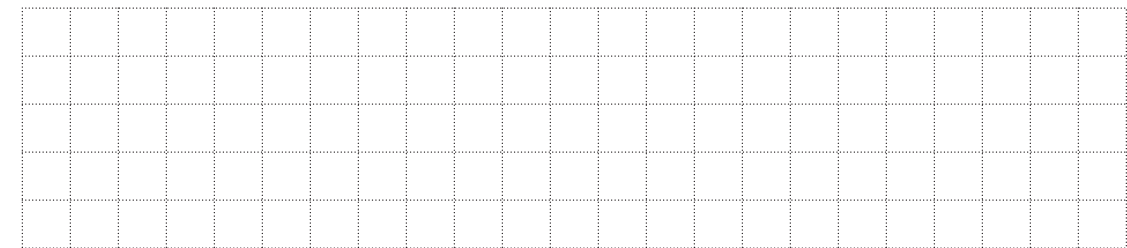
- Use unit Algebra Tiles to make 3 different rectangles with the same area.
- Write a sentence to show that the area equals the width times the length.



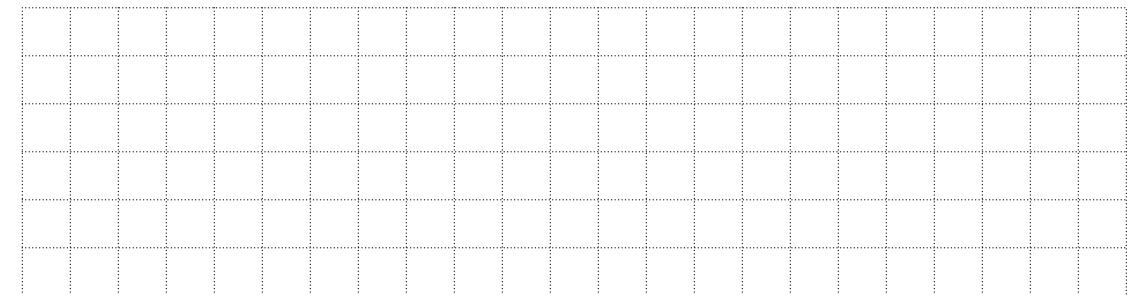
- Use 16 squares.



- Use 18 squares.



- Use 20 squares.



## Challenge

What is the width of the rectangle in each set with the greatest perimeter? \_\_\_\_\_

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