

LESSON 11

Objective

Find the area of squares.

Common Core State Standards

- **3.MD.5b** Understand that a plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.
- **3.MD.6** Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

Measurement and Data

Area of Squares

Area, the amount of space a plane figure takes up, can be hard for children to grasp, unless they can see the object broken up into equal measures. Children should begin exploring the concept of area by placing objects such as Color Tiles next to one another to create shapes and then counting the number of units to find the area. As they get older, they can find area by tiling a space and counting the number of tiles.

Try It! Perform the Try It! activity on the next page.

Talk About It

Discuss the Try It! activity.

- **Ask:** What do you notice about the number of tiles in each row and column on each square?
- **Ask:** When might it be important to know how much space a shape takes up?
- **Say:** Suppose we have a large square. **Ask:** If we want to know what it measures all around the outside, what do we measure? Lead children to define *perimeter*. **Ask:** If we want to know how much space it takes up, what do we measure? Lead children to discuss *area*. Discuss how in this activity, children measured area using tiles as units.

Solve It

With children, reread the problem. Have children create a mosaic out of 1-inch squares of colored paper. Have them glue the mosaic onto a sheet of paper to make a design that is a 4×4 square. Have them record the area of their mosaic in squares (16).

More Ideas

For other ways to teach about finding the area of squares—

- Have children use Geoboards and rubber bands to create squares and then count the square units inside to find the area.
- Have children use Base Ten Blocks (units) to build large squares. Then have them count the units to determine the area of each.

Formative Assessment

Have children try the following problem.

How many square units in all will fill this large square?



- A. 3 square units B. 6 square units C. 9 square units D. 12 square units

Try It! 25 minutes | Pairs

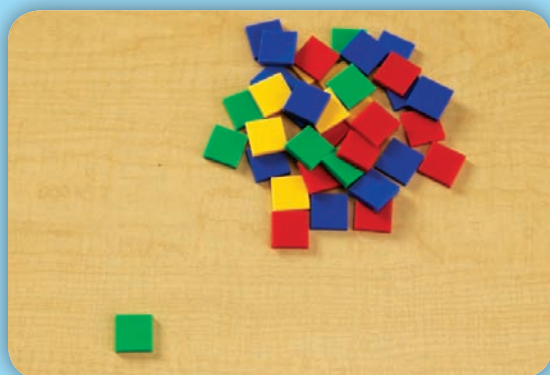
Here is a problem about finding the area of squares.

Mrs. Fiene, the art teacher, is having the class make mosaics, which are designs made of Color Tiles. The children practice their design using 1-inch tiles. The children need to arrange their tiles to make a 4×4 square. How many tiles will be in each design?

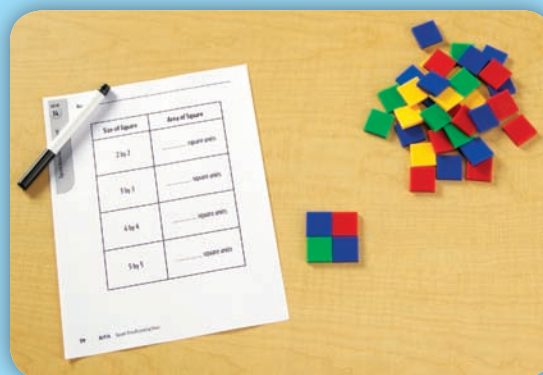
Introduce the problem. Then have children do the activity to solve the problem. Distribute a Square Area Recording Sheet (BLM 6) and Color Tiles to students.

Materials

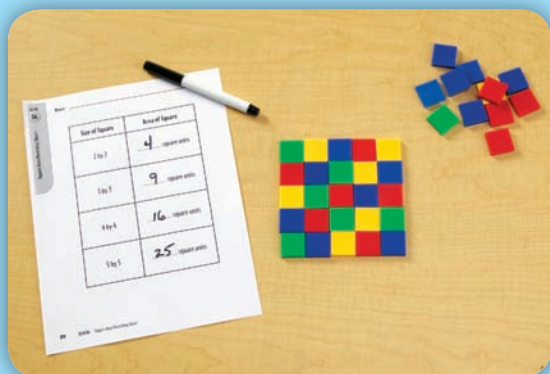
- Color Tiles (25 per pair)
- Square Area Recording Sheet (BLM 6; 1 per pair)



1. Use tiles to make a 2×2 square. **Say:** *I am making a square. We are going to find the area of the square. Area is the amount of space taken up by the tiles that fill up the shape, and it is measured in square units. Display one tile and explain that one tile equals one square unit. Ask: How might we find out the area of this square?* Explain how to count the number of units.



2. **Say:** *Now build a 2×2 square. Remember that the tiles must touch each other, but not overlap. Find the area and write it on your Square Area Recording Sheet. Have one partner build the square and the other count the tiles to find the area and record the answer on the recording sheet.*



3. Have partners work together to build the other squares listed on the recording sheet. For each square, they count the tiles to find the area and record each answer on the recording sheet.

Look Out!

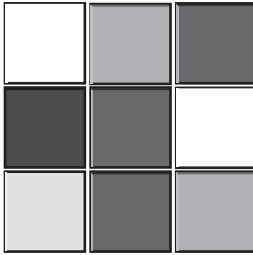
Some students might confuse area with perimeter. Stress that area is like a rug that covers a surface, and perimeter is like a fence that goes around the outside of something. You might say that perimeter shows how far one needs to walk around the shape. For concrete practice with area, you might have students fill in predefined boxes on paper or silhouettes, or measure the perimeter and area of squares and compare the measurements.



Use Color Tiles. Build each square. What is the area of the square?

(Check students' work.)

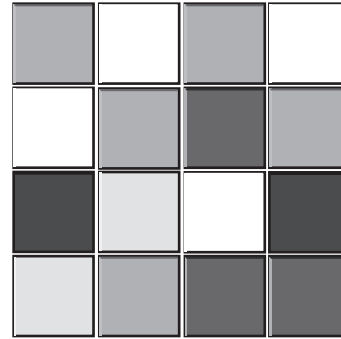
1.



9

square inches

2.



16

square inches

Use Color Tiles. Build each square. Draw the square. Find the area.

(Check students' work.)

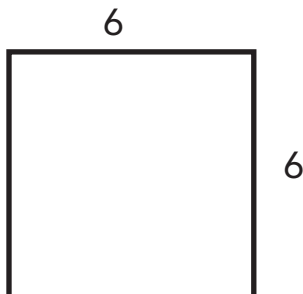
3. 5 inches $\times$ 5 inches

25

square inches

Find each area.

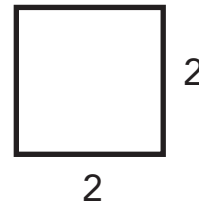
4.



36

units

5.



4

units

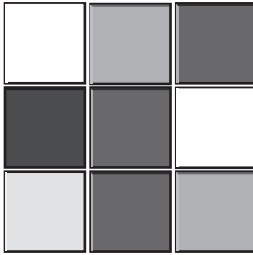
Answer Key

Challenge! How is finding the perimeter of a square different from finding its area?

Challenge: (Sample) To find the perimeter of a square, count the number of units on the outside of the square. To find the area of a square, count the number of square units that make the inside of the square.

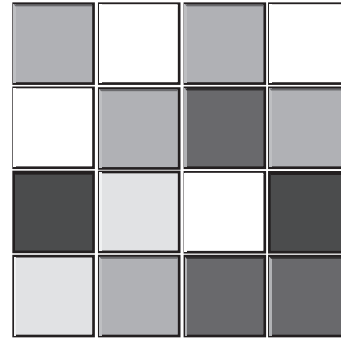
Use Color Tiles. Build each square. What is the area of the square?

1.



_____ square inches

2.



_____ square inches

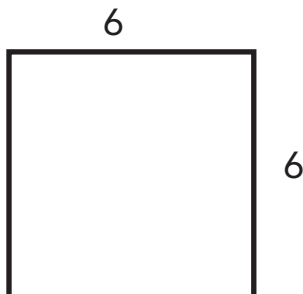
Use Color Tiles. Build each square. Draw the square. Find the area.

3. 5 inches $\times$ 5 inches

_____ square inches

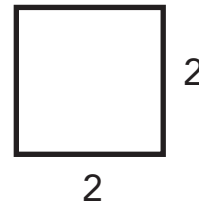
Find each area.

4.



_____ units

5.



_____ units

Name _____

Challenge! How is finding the perimeter of a square different from finding its area?

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Name _____

Size of Square	Area of Square
2 by 2	_____ square units
3 by 3	_____ square units
4 by 4	_____ square units
5 by 5	_____ square units