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Understanding Area

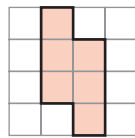


Introduction

A **plane figure** is a flat surface. The size of the space inside the plane figure is its **area**. One way to measure area is to count the number of square units that cover a figure. A **square unit** is a square with a side of 1 unit. As long as the square units do not have gaps between them or overlap, the number of square units is the area of the figure.

Area is always measured in square units.

Look at the figure in red on the grid below.

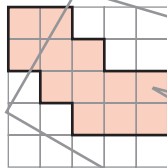


 = 1 square unit

The red figure is made up of 6 square units. Its area is 6 square units.

A unit can be any measurement used for length. A square unit may stand for a square inch, square foot, or another square unit.

What is the area of the figure in red?



 = 1 square centimeter

Look at the key on the right. It shows that 1 square unit is equal to 1 square centimeter. The red figure is made up of 12 square units. So, its area is 12 square centimeters.

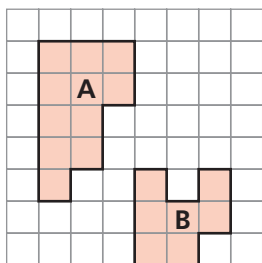
Think About It



Why might it be important to measure the area of something? What might area help you understand?

When figures are drawn on grids, you can see the square units inside. Always look at the key to see what each square unit shows.

- ▶ Two students are each asked to draw a figure with an area of 8 square inches. Which student, if either, is correct?



= 1 square inch

What is the area of each square unit? _____

How can you find the area of each figure?

How many squares cover the figure student A made? _____

What is the area of student A's figure? _____

How many squares cover the figure student B made? _____

What is the area of student B's figure? _____

Did either student make a figure with an area of 8 square inches? _____

How can student A correct the figure to make it have the correct area?

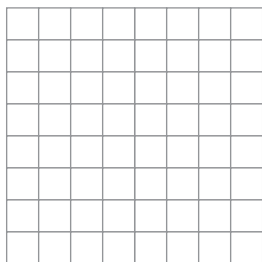
How can student B correct the figure to make it have the correct area?

Count the squares inside the figures.

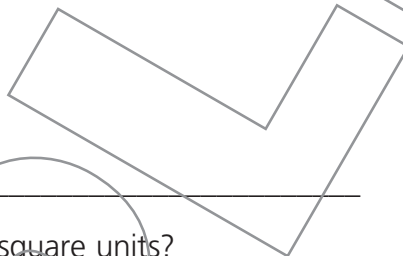
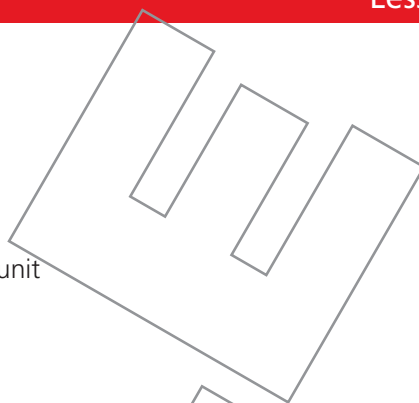
Is the area greater than 8 square inches or less?

Use a grid to draw a figure with a certain area.

- ▶ Draw a figure with an area of 15 square units.



□ = 1 square unit



What is the area of each square on the grid? _____

How can you show a figure with an area of 15 square units?

Can the squares in the figure overlap? _____

Can you leave spaces between the squares in the figure? _____

Draw a figure with an area of 15 square units.

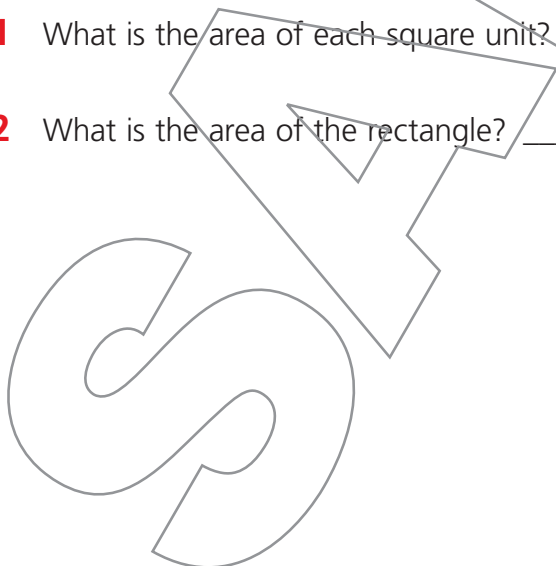
Use what you know about area to answer these questions about the figure below.



□ = 1 square foot

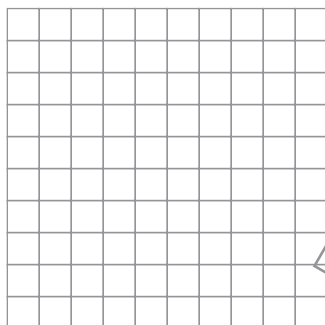
1 What is the area of each square unit? _____

2 What is the area of the rectangle? _____



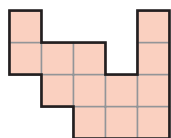
Solve the following problems.

- 1 On the grid below, draw a figure that has an area of 40 square units.



Remember that unit squares cannot have gaps or overlap.

- 2 What is the area of the figure?

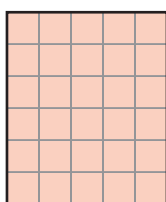


1 square unit

Count the number of unit squares that make up the figure.

Answer _____ square units

- 3 What is the area of the figure?



1 square centimeter

How many rows of squares are there?
How many squares are in each row?

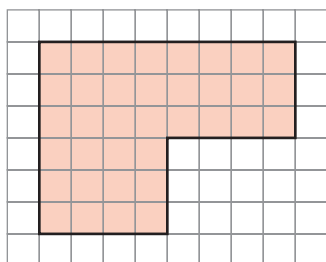
Answer _____ square centimeters

Solve the following problems.

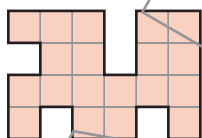
- 1 Pablo is measuring the area of a plane figure. He is using a unit square with a side length of 1 yard. What is the area of 1 square unit?

Answer _____

- 2 What is the area of the shaded figure?

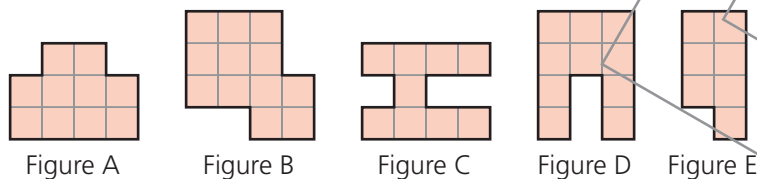


- A 12 square units
B 24 square units
C 36 square units
D 48 square units
- 3 What is the area of the figure?



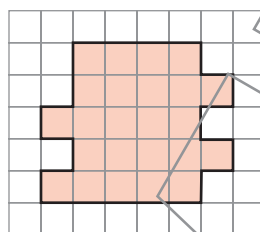
Answer _____ square units

- 4 Each square in each shape measures 1 square centimeter. Put each shape in the correct part of the table by matching its area.



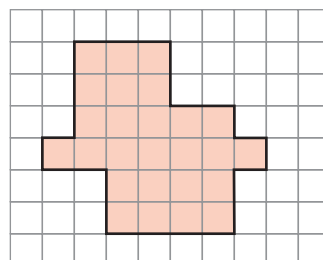
Area Is Smaller Than 10 Square Centimeters	Area Is 10 Square Centimeters	Area Is Larger Than 10 Square Centimeters

- 5 Each square unit on the grid has a side of 1 meter.



What is the area of the shaded figure?

- A 20 square meters
 - B 22 square meters
 - C 24 square meters
 - D 26 square meters
- 6 Look at the figure on the grid at the right. What is the area of this figure?

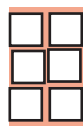


1 square = 1 square centimeter

Answer _____ square centimeters

- 7 A photographer made a display of photographs. She covered a wall with 50 square photographs. The entire wall was covered without gaps or overlaps. Each photograph is 1 foot long on each side. What is the area of the wall? Explain how you know.

- 8 Tiana measured the area of a piece of paper shaped like a plane figure as shown. She placed squares units on the paper. Tiana found the area to be 6 square units.



 = 1 square unit

What error did Tiana make?
