

# Grade 3 · Area · Lesson

Common Core 3.MD.C.5, 3.MD.C.6, 3.MD.C.7 · mathovore.fr

Area is the amount of flat space inside a shape. We measure it by counting unit squares, which are squares with sides 1 unit long. The area of a rectangle equals its rows times its columns, so a rectangle 5 units wide and 3 units tall has an area of 15 square units.

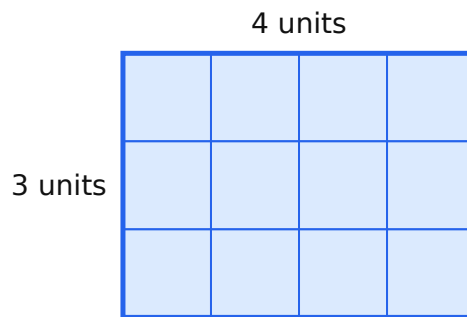
**Grade 3 Common Core: 3.MD.C.5 · 3.MD.C.6 · 3.MD.C.7**

## Key facts:

- A unit square has sides 1 unit long and an area of 1 square unit.
- Area is measured in square units such as sq cm, sq in, sq ft and sq m.
- Area of a rectangle = length times width, which is rows times columns.
- A rectangle can be split into parts, and the whole area is the sum of the part areas.
- To find the area of an L-shape, split it into rectangles and add their areas.

## What is area?

Area is the amount of flat space inside a shape. To measure it, cover the shape with **unit squares** that fit together with no gaps and no overlaps. A unit square has sides 1 unit long, and it covers **1 square unit**. Count the squares and you know the area.



Count 12 unit squares: the area is 12 square units.

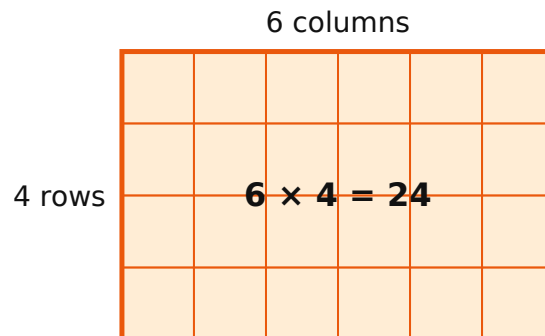
## Square units

Area is written in square units: square centimeters (sq cm), square inches (sq in), square feet (sq ft) or square meters (sq m). The word square tells us we are counting squares, not lengths.

## How do you find the area of a rectangle by multiplying?

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Rows of squares make an array. A rectangle with 4 rows and 6 squares in each row has  $4 \times 6 = 24$  squares. So you can skip the counting and multiply the two side lengths.



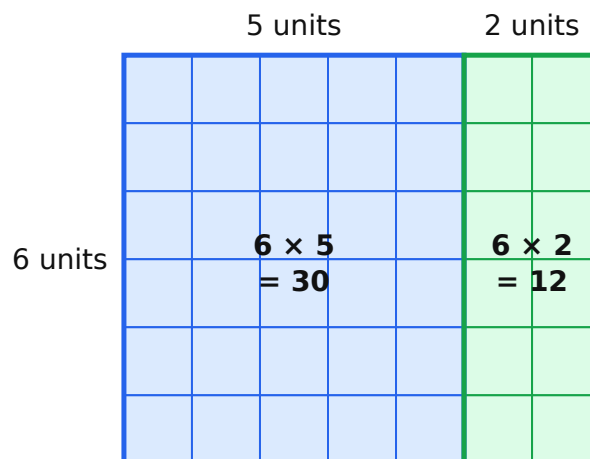
A 6-by-4 array: 6 squares in each of 4 rows makes 24 square units.

| Length | Width | Area                    |
|--------|-------|-------------------------|
| 3 ft   | 2 ft  | $3 \times 2 = 6$ sq ft  |
| 5 ft   | 4 ft  | $5 \times 4 = 20$ sq ft |
| 6 ft   | 3 ft  | $6 \times 3 = 18$ sq ft |

## How does the distributive property help with area?

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Big rectangles can be split into smaller ones. A rectangle 7 units wide and 6 units tall can be cut into a part 5 wide and a part 2 wide. Find each part, then add:  $6 \times 7 = 6 \times (5 + 2) = 30 + 12 = 42$ . Splitting one side into two parts is the **distributive property**.



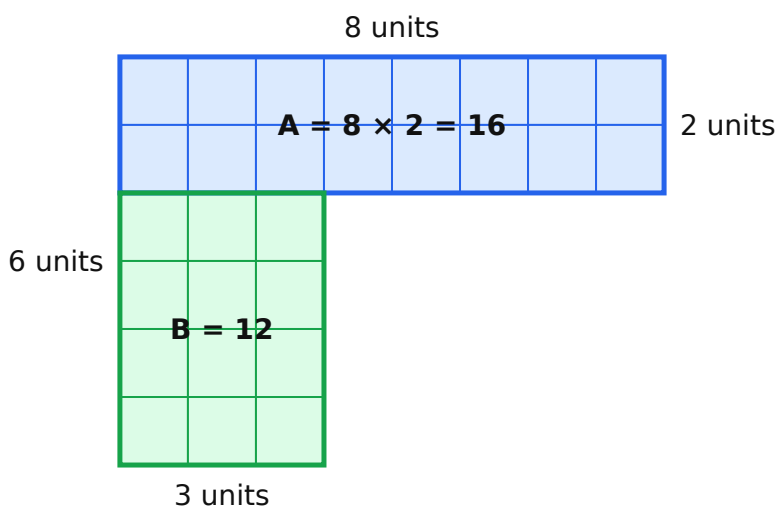
Area of a split rectangle:  $30 + 12 = 42$  square units.

## How do you find the area of an L-shaped figure?

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An L-shape is not a rectangle, but it is made of rectangles. Split it, find each area, and add the areas.

1. Draw a line that cuts the figure into two rectangles.
2. Find the length and width of each rectangle. Use the outside numbers: the tall side is 6 units, and the top bar is 2 units tall, so the lower part is  $6 - 2 = 4$  units tall.
3. Multiply for each rectangle:  $8 \times 2 = 16$  and  $3 \times 4 = 12$ .
4. Add:  $16 + 12 = 28$  square units.

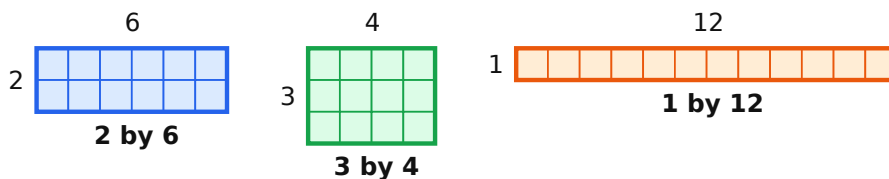


An L-shape split into rectangle A (16 square units) and rectangle B (12 square units): 28 square units in all.

## Can different rectangles have the same area?

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Yes. A 2-by-6, a 3-by-4 and a 1-by-12 rectangle all have an area of 12 square units, because  $2 \times 6 = 3 \times 4 = 1 \times 12 = 12$ . The shapes look different, but they cover the same amount of flat space.



Three rectangles with different shapes and the same area, 12 square units.

## Area: frequently asked questions

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### What is a square unit?

A square unit is a square whose sides are all 1 unit long, such as 1 centimeter or 1 foot. It covers exactly 1 square unit of area. We count square units to measure how much flat space a shape covers.

### **Why is area written in square units?**

Area counts squares that cover a shape, not lengths along its edge. A rectangle that is 4 feet by 3 feet is covered by 12 squares that are each 1 foot on a side, so its area is 12 square feet.

### **How do you find a missing side when you know the area?**

Think of a multiplication fact with a missing factor. If a rectangle has an area of 35 square inches and a length of 7 inches, ask what number times 7 makes 35. The width is 5 inches.

### **What is the distributive property in an area model?**

It means you can split one side of a rectangle into two parts and add the two smaller areas. For example, 6 times 8 equals 6 times 5 plus 6 times 3, which is 30 plus 18, or 48.

### **Does turning a rectangle change its area?**

No. A rectangle that is 3 units wide and 5 units tall covers the same 15 square units as one that is 5 units wide and 3 units tall. Turning or sliding a shape never changes its area.