

Grade 3, Module 4: Multiplication and Area



What is this module about? In this 20-lesson module, students explore area as an attribute of two-dimensional figures and relate it to their prior work with multiplication. Students will learn how to calculate the area of a floor plan of their own design.



What came before this module? We worked extensively on relating multiplication and division, learned several different strategies for those operations and practiced our math facts.

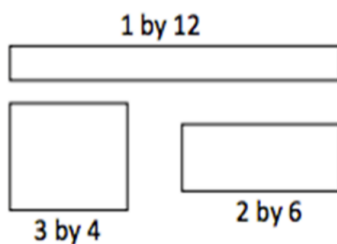


What comes after this module? We will begin to formalize our understanding of fractions as equal parts of a whole, using the number line as well as area models to support our learning.

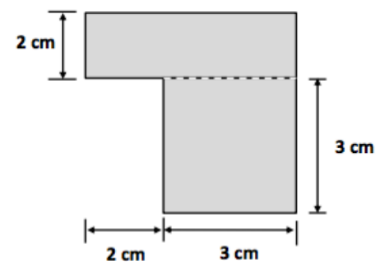
How can you help at home?

- Continue to review multiplication and division math facts with your student.
- Practice drawing simple two-dimensional rectangular shapes and calculating the area using multiplication.

Students will learn, through concrete experience, that each of these rectangles has the same area, and relate their learning to multiplication.



Toward the end of this module, students will learn how to calculate the area of an irregular shape like this one by looking at the area of the rectangles within the shape.



Key Words and Ideas in this Module

- **Area:** the amount of two-dimensional space inside a bounded region
- **Area model:** a model for multiplication that relates rectangular arrays to area
- **Square unit:** a unit of area (could be square centimeters, inches, feet or meters)
- **Tile (as a verb):** to cover a region without gaps or overlaps
- **Unit square:** whatever the length unit, a unit square is a one unit by one unit square of that length
- **Whole number:** an integer number without fractions
- **Terms to review:** array, commutative property, distribute, length, multiplication

Key Standards in this Module

- Geometric measurement: understand concepts of area and relate area to multiplication and to addition

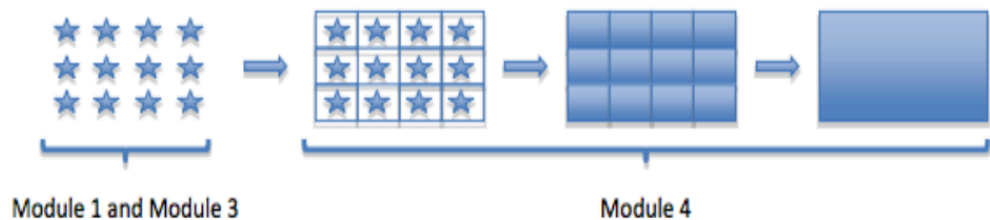


Spotlight on Math Models

Area Models

Students began in earlier grades to build arrays, showing multiplication and division as a series of rows and columns. In Grade 3, they begin the transition to understanding these types of problems in the context of an area model. As students move through the grades, the area model will be a powerful tool that can take them all the way into algebra and beyond. One of the goals in the curriculum is to first give students concrete experiences with mathematical concepts, then build slowly toward more abstract representations of those concepts. The area model is a tool that helps students to make that important leap.

This flow chart shows how 3rd grade students start working with arrays in earlier Modules of *A Story of Units*. In Module 4, they become comfortable with the connection between rectangular arrays to the area of a two-dimensional region.



Sample problem from Module 4 (Lesson 13)

Anil finds the area of a 5-inch by 17-inch rectangle by breaking it into two smaller rectangles. Show one way that he could have solved the problem.

What is the area of the rectangle?

Possible solution:

$$5 \times 17 = (5 \times 10) + (5 \times 7)$$
$$5 \times 17 = 50 + 35 = 85$$

The area of the rectangle is 85 sq. in.