

DUVAL Math

Parent Tips

Multiplication and Area

In this 20-day module, students explore area as an attribute of two-dimensional figures and relate it to their prior work with multiplication. Students will build understanding that a 2×6 , 1×12 , and 3×4 rectangle each have the same area, and will learn how to calculate the area of a floor plan of their own design.

**Third Grade,
Module 4**

What Comes Before this Module: Students worked extensively on relating multiplication and division, learned several different strategies for those operations, and practiced math facts.

What Comes After This Module: Students will begin to formalize understanding of fractions as equal parts of a whole, using the number line as well as area models to support learning.

Special points of interest:

- ✓ Words to Know
- ✓ Foundations for Understanding Area
- ✓ Application of Area and Area Models
- ✓ Mathematical Practices
- ✓ Homework Helpline

Words to Know

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 (e.g. centimeters, inches), a unit square is a 1 unit by 1 unit square of that length

Whole Number: an integer number without fractions

Questions?

Mrs. Wendy Dobson

Supervisor, Mathematics K-5

dobsonw@duvalschools.org

Terms to Review:

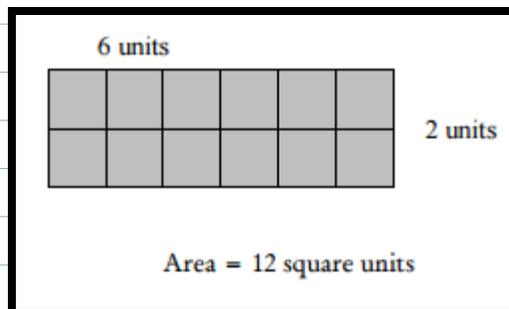
Array

Commutative Property

Distribute

Length

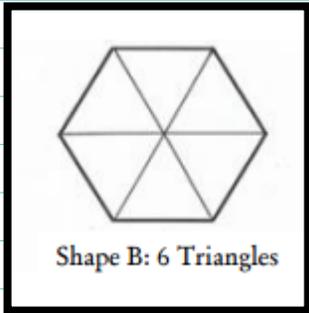
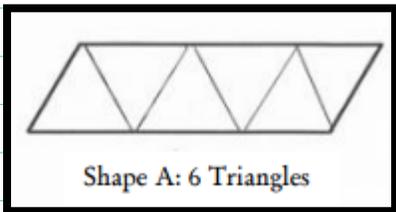
Multiplication



Foundations for Understanding Area

Foundations for Understanding Area

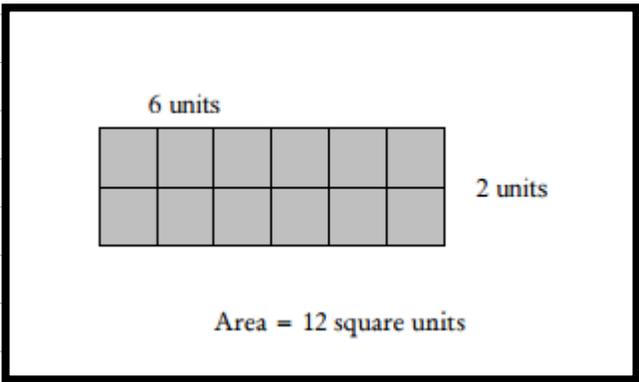
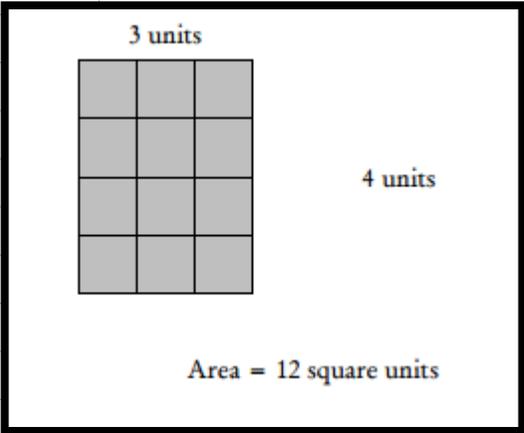
Students will be introduced to area. They will use pattern blocks to tile given polygons without gaps or overlaps to determine the amount of two-dimensional space is within a region or shape.



When we are “tiling” we want to make sure there are no gaps or overlaps. We are also looking for the space **INSIDE** the polygon. The units for **AREA** are **ALWAYS** square units (square inches, square centimeters, etc.)

Square Units

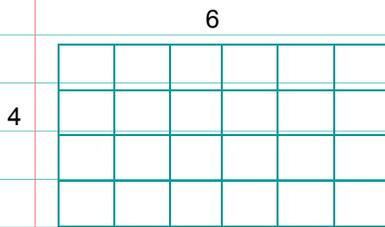
Through exploration students will work with square units (square centimeters and square inches) to create rectangular arrays with the same area, but different side lengths. By the end of Topic A, students will begin to relate total area with multiplication of side lengths.



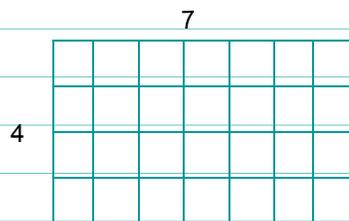
Application of Area and Area Models

In Lesson 9, students will cut apart rectangular grids and rearrange the parts to create new rectangles with the same area.

Example: Furaha's Rahema use square tiles to make the rectangles shown Label the side lengths on the rectangles above and find the area of each rectangle

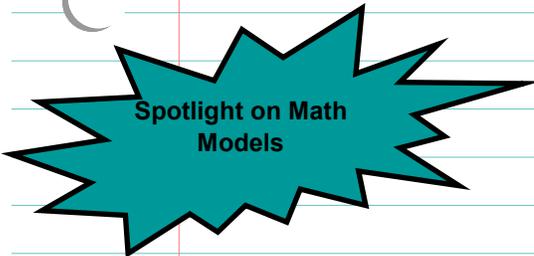


Furaha's Rectangle



Rahema's Rectangle

$4 \times 6 = 24$
 Furaha's rectangle has an area of 24 sq. units.
 $4 \times 7 = 28$
 Rahema's rectangle has an area of 28 sq. units

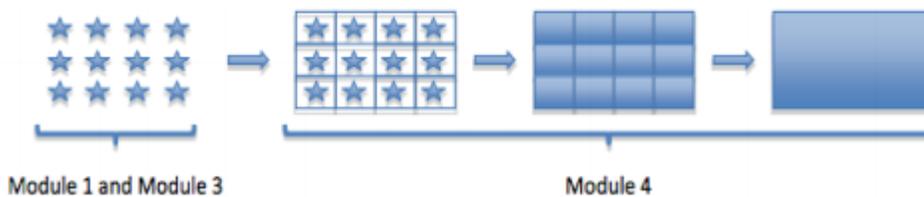


Spotlight on Math Models

Students began in earlier grades to build arrays, showing multiplication and division as a series of rows and columns.

In 3rd grade, 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.

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.



Standards for Mathematical Practice

Mathematical Practices Addressed in this Module:

- MP.2** Reason abstractly and quantitatively. Students build toward abstraction starting with tiling a rectangle, then gradually moving to finishing incomplete grids and drawing grids of their own, then eventually working purely in the abstract, imaging the grid as needed.
- MP.3** Construct viable arguments and critique the reasoning of others. Students explore their conjectures about area by cutting to decompose rectangles and then recomposing them in different ways to determine if different rectangles have the same area. When solving area problems, students learn to justify their reasoning and determine whether they have found all possible solutions, when multiple solutions are possible.
- MP.6** Attend to precision. Students precisely label models and interpret them, recognizing that the unit impacts the amount of space a particular model represents, even though pictures may appear to show equal sized models. They understand why when side lengths are multiplied the result is given in square units.
- MP.7** Look for and make use of structure. Students relate previous knowledge of the commutative and distributive properties to area models. They build from spatial structuring to understanding the number of area-units as the product of number of units in a row and number of rows.
- MP.8** Look for and express regularity in repeated reasoning. Students use increasingly sophisticated strategies to determine area over the course of the module. As they analyze and compare strategies, they eventually realize that area can be found by multiplying the number in each row by the number of rows.

home > departments > academic services



Grades K-5 Homework Help Duval County Parent Helpline

Tuesday and Thursday Evenings (see dates to the right)

6:00 p.m. – 8:00 p.m

Grades K-5 Homework Help

You can access this help on your home computer so that we can demonstrate the mathematics on a white board or call in via telephone.

By Telephone: (571)-392-7703 PIN: 731 439 616 412

By Web: [click here](#)

Want to help your child at home with DUVAL Math? Every Tuesday and Thursday evening, we are offering a Homework Helpline! You can access using a home computer or call in via telephone. Use the link below to access more information!

<http://www.duvalschools.org/Page/17877>

