3rd Grade Math

ELG 3.MD.C: Geometric measurement: understand concepts of area and relate area to multiplication and to addition

Vertical Progression:

1st Grade	**1.G.A Reason with shapes and their attributes.** ○ **1.G.A.3** Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.
2nd Grade	**2.OA.C Work with equal groups of objects to gain foundations for multiplication.** ○ **2.OA.C.4** Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends. **2.G.A Reason with shapes and their attributes.** ○ **2.G.A.2** Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
3rd Grade	**3.MD.C Geometric measurement: understand concepts of area and relate area to multiplication and to addition.** ○ **3.MD.C.5** Recognize area as an attribute of plane figures and understand concepts of area measurement. • **3.MD.C.5.a** A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. • **3.MD.C.5.b** 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.C.6** Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units). ○ **3.MD.C.7** Relate area to the operations of multiplication and addition. • **3.MD.C.7.a** Find the area of a rectangle with whole number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. • **3.MD.C.7.b** Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. • **3.MD.C.7.c** Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the Distributive Property in mathematical reasoning. • **3.MD.C.7.d** Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.
4th Grade	**4.MD.A Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.** ○ **4.MD.A.3** Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

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Students will demonstrate command of the ELG by:

- Finding areas of rectangles with whole number side lengths using a variety of methods.
- Determining one side length of a rectangle, given the area and the other side length.
- Representing whole number products as rectangular areas.
- Using tiling to show that areas of rectangles with whole number side lengths a and b + c are the sum of a x b and b x c.
- Using area models to represent distributive property.
- Recognizing area as additive.
- Finding areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding areas for non-overlapping parts.
- Counting unit squares to measure areas.

Vocabulary:

- Area
- Array
- Column
- Gap
- Length
- Measure
- Multiplication
- Overlap
- Rectangle
- Row
- Square unit
- Unit square
- Unit
- Width

Sample Instructional/Assessment Tasks:

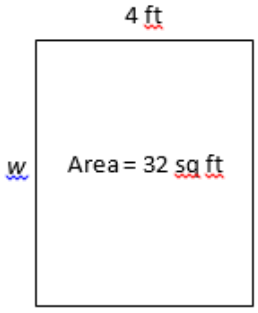
1) **Standard: 3.MD.C**

Source: https://www.engageny.org/resource/grade-3-mathematics-module-4-topic-d-lesson-12

Item Prompt: Theo's Banner

The area of Theo's banner is 32 square feet. If the length of his banner measures 4 feet, how wide is his banner? Draw a model to represent the problem and solve for the width.

Correct Answer/Commentary:



width=8 feet

2) **Standard(s): 3.MD.C**

Source: http://www.k-5mathteachingresources.com/support-files/designing-a-flower-bed.pdf

Item Prompt: Designing a Flower Bed

1. You have been asked to design a flowerbed for a garden. The flower bed must:
- be made from two different sized rectangles that are joined along one side
- have a total area of 30 square feet.

2. Draw a possible design for the flowerbed. Be sure to include measurements.

3. Explain how you calculated the area of the flowerbed.

Correct Answer/Commentary:

Download task from site.

Students often confuse area and perimeter in cases like Designing a Flower Bed. Consider addressing this common misconception prior to assigning the task.

Possible correct answers would include, but are not limited to: one 4 by 5 rectangle and one 2 by 5 rectangle, one 5 by 5 rectangle and one 1 by 5 rectangle, one 3 by 4 rectangle and one 3 by 6 rectangle.

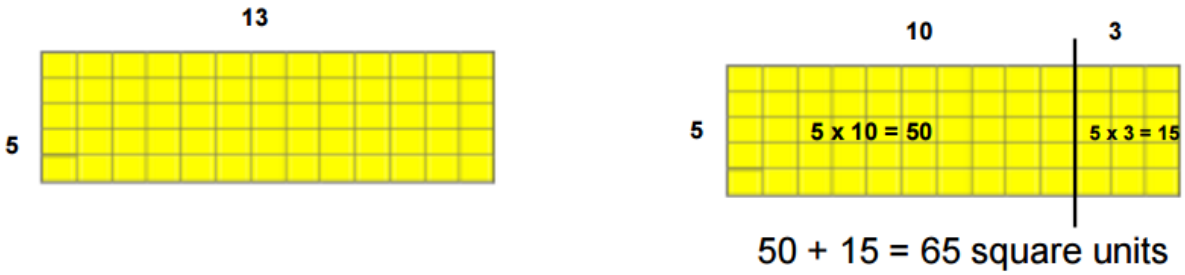
3) **Standard(s): 3.MD.C**

Source: http://www.k-5mathteachingresources.com/support-files/jacks-rectangles.pdf

Materials: Area cards (print from link)

Item Prompt: Jack's Rectangles

Jack needed to find the area of a rectangle that was 5 square units by 13 square units. He decided to break the rectangle into two smaller rectangles, find the area of each rectangle and then add the partial products.



Your turn: Choose 3 rectangles from the pack. Show how you could use Jack's strategy of breaking apart a rectangle to find the area of each figure.

Correct Answer/Commentary:

Task must be downloaded from site. Multiple correct answers.