

## Topic D

# Recording Perimeter and Area Data on Line Plots

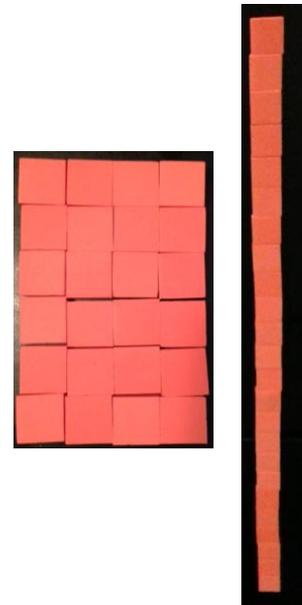
3.MD.4, 3.MD.8, 3.G.1

<b>Focus Standard:</b>	3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.
	3.MD.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
<b>Instructional Days:</b>	5	
<b>Coherence -Links from:</b>	G2–M6	Foundations of Multiplication and Division
	G3–M6	Collecting and Displaying Data
<b>-Links to:</b>	G4–M3	Multi-Digit Multiplication and Division

In Topic D, students utilize a line plot to draw conclusions about perimeter and area measurements.

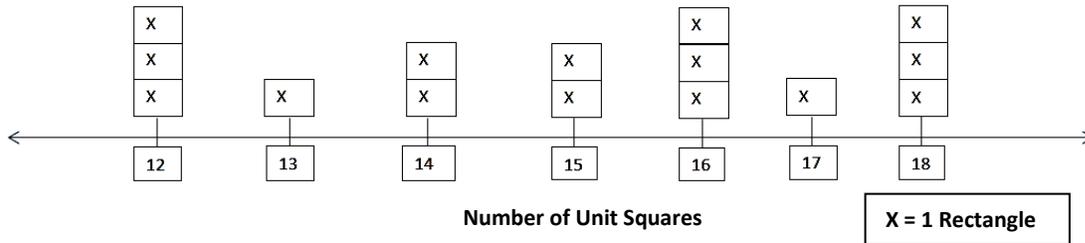
Students use a given number of unit squares to build and determine different perimeters of rectangles in Lesson 18. For example, given a rectangle composed of 24 unit squares, students find there are four possible perimeters: 50, 28, 22, and 20 length units. They draw their rectangles on grid paper and discuss the fact that rectangles with side lengths that are equal or almost equal (squares or square-like rectangles) have smaller perimeters than rectangles whose side lengths are very different (long and narrow rectangles). Students continue to explore with different numbers of unit squares and record the number of possibilities, noting when they have found all the possible combinations. They recognize that area and perimeter are measured in different units and conclude that, in general, there is no way of knowing an exact perimeter for any number of unit squares without more information about the side lengths.

In Lesson 19, students use a given number of unit squares to make all possible rectangles. They construct line plots showing the number of rectangles they constructed for each number of unit squares. Students analyze the line plot and

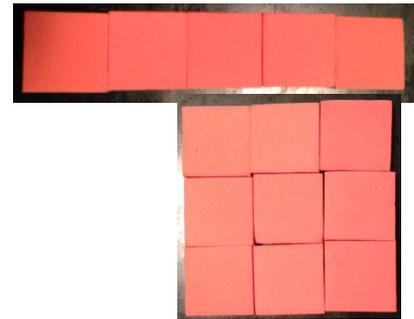


draw conclusions based on the data. They discuss why some numbers of unit squares, such as 13, produce only one possible perimeter.

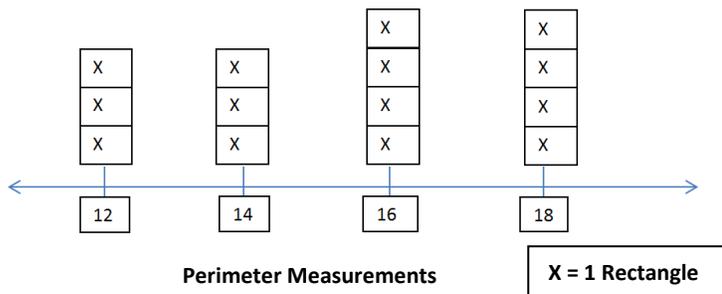
Number of Rectangles Made With Unit Squares



Using understanding that perimeter is double the sum of the length and width, in Lessons 20 and 21, students find the different areas of rectangles made with unit squares and a given perimeter. For example, they are asked to build rectangles with a perimeter of 12 unit squares and divide 12 by 2 to find that the sum of the length and width is 6. Students then determine that they can make three rectangles whose lengths and widths add to 6, which results in rectangles made with 5, 8, or 9 unit squares. Students discuss differences in the areas of rectangles with the same perimeter. They record their findings for use in Lesson 22, when they again construct a line plot and draw conclusions about the data.



Number of Rectangles Made With a Given Perimeter



**A Teaching Sequence Towards Mastery to Recording Perimeter and Area on Line Plots**

**Objective 1: Construct rectangles from a given number of unit squares and determine the perimeters. (Lesson 18)**

**Objective 2: Use a line plot to record the number of rectangles constructed from a given number of unit squares. (Lesson 19)**

**Objective 3: Construct rectangles with a given perimeter using unit squares and determine their areas. (Lessons 20–21)**

**Objective 4: Use a line plot to record the number of rectangles constructed in Lessons 20 and 21. (Lesson 22)**