### Purpose:
To compute the areas of rectangles from the product of their side lengths

### Materials:
Sheet of Grid Paper (attached), pencils and paper

## TEACHER MODELING/STUDENT COMMUNICATION

### Activity 1 Finding areas of rectangles with mixed number side lengths

1. Distribute a sheet of grid paper to each student and pose the following problem.

   - **If a tablecloth has dimensions of 2 yards by 3 ½ yards, what is its area in square yards?**

   a. Outline a rectangle on your grid paper with dimensions of 2 by 3 1/2 and label the lengths of two of its sides. (The numbers along the edges represent length, that is, linear units, and the numbers inside the squares represent area, that is, square units.)

   b. What is the area of the tablecloth in square yards? (7 square yards)

   c. Can this area be found by multiplying the lengths of the two sides? (Yes) Compute their product. \((2 \times 3\frac{1}{2}) = 2 \times \frac{7}{2} = \frac{14}{2} = 7\) square yards

   d. If each square yard costs 3 dollars, what is the cost of the tablecloth? ($21)

2. Sketch and label the side of the rectangle with the dimensions and determine the area.

   - **a.** 3 units by 4 1/2 units
   - **b.** 5 units by 3 1/3 units

### Activity 2 Finding areas of rectangles with fractional side lengths

1. Using one of the squares on the grid sheet, divide the left edge into 3 equal parts and label one part 1/3. Divide the top edge into 2 equal parts and label one part 1/2.
1. a. Draw lines across the square for the 1/3 and the 1/2 marks to subdivide the square into small rectangles. How many small rectangles are there? (6)

b. If the area of the large square has an area of 1 square unit, what is the area of one of the 6 small rectangles? (1/6 square unit)

c. Can the area of one of the small rectangles be found by multiplying the lengths of its sides? (Yes) What is this product? (1/3 × 1/2 = 1/6)

2. On your sheet of grid paper, outline and label the sides of the following two rectangles with the given dimensions. Determine each area in two ways: (1) Subdividing the unit square into smaller rectangles; and (2) Computing the product of the two fractional lengths of the sides of the rectangle.

   a. 1/2 unit by 2/3 unit
   b. 3/4 unit by 1/3 unit

   Area:
   a. 2/6 = 1/3 sq unit
   b. 3/12 = 1/4 sq unit

3. A 1 ¾ foot by 1 ½ foot rectangular sheet of metal is cut from a 2 foot by 2 foot sheet. What is the area of the sheet of metal?

   a. Use four of the unit squares on the grid sheet to sketch a rectangle with dimensions of 1 ¾ by 1 ½.

   b. Subdivide the four unit squares as shown and label each part with a number for its area. For the unit square with 4 parts, each part is ¼ square foot, and for the unit square with 8 parts, each part is 1/8 square foot.

   c. The area of the 1 ¾ by 1 ½ rectangle is the sum of the areas for the eight parts. What is this sum? (2 5/8, so the area of the metal sheet is 2 5/8 square feet).

   d. Can the area also be found by computing the product of the lengths of the sides of the rectangle? (Yes)

   e. Compute the product 1 ¾ × 1 ½ by using improper fractions. Write the answer as a mixed number. (1 ¾ × 1 ½ = 7/4 × 3/2 = 21/8 = 2 5/8)

INDEPENDENT PRACTICE and ASSESSMENT

Worksheet 5.NF.4 #7