Eureka Math

4th Grade
Module 5
Lesson 11

At the request of elementary teachers, a team of Bethel & Sumner educators met as a committee to create Eureka slideshow presentations. These presentations are not meant as a script, nor are they required to be used. Please customize as needed. Thank you to the many educators who contributed to this project!

Directions for customizing presentations are available on the next slide.

Icons

RDW — Read, Draw, Write

Learning Target

Personal White Board

Problem Set

Manipulatives Needed

Fluency

Think Pair Share
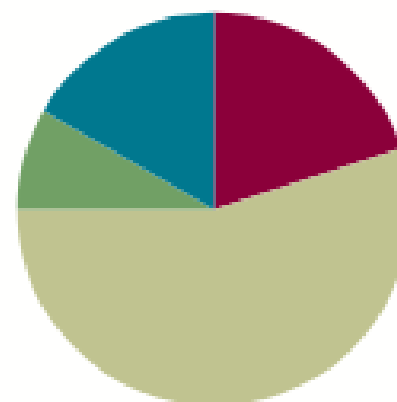
Whole Class

Individual

Partner

Small Group

Small Group Time

Lesson 11

Objective: Explain fraction equivalence using a tape diagram and the number line, and relate that to the use of multiplication and division.

Suggested Lesson Structure

■ Fluency Practice	(12 minutes)	
■ Application Problem	(5 minutes)	
■ Concept Development	(33 minutes)	
■ Student Debrief	(10 minutes)	
Total Time	**(60 minutes)**	

Explain fraction equivalence using a tape diagram and the number line, and relate that to the use of multiplication and division.

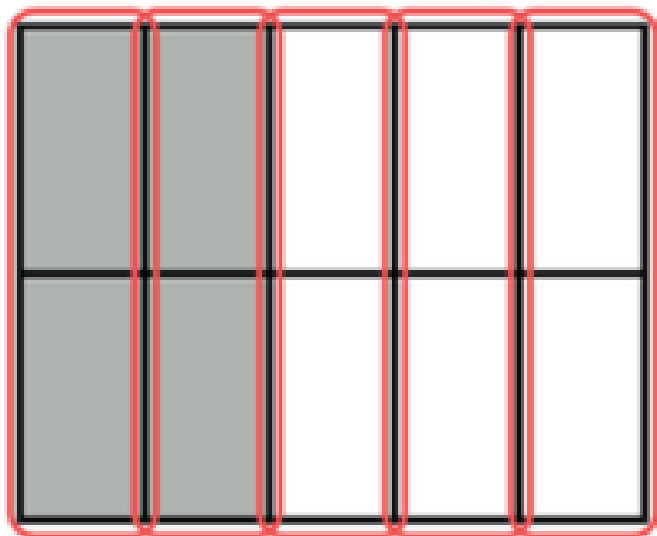# Find the Quotient and the Remainder

$$6,765 \div 2$$

Find Equivalent fractions

$$\frac{2}{10} = \frac{\div}{\div} = -$$

- Fill in the unknown numbers to find the equivalent fraction.

Draw Equivalent fractions

- Draw the model and write the fraction that is shaded.

- Compose the shaded units into larger unit by circling. Then, complete the number sentence.

$$\frac{4}{10} = \frac{4}{10} \div \frac{\quad}{\quad} = \frac{\quad}{\quad}$$

$$\frac{4}{10} = \frac{4}{10} \div \frac{2}{2} = \frac{2}{5}$$

Application Problem

Kelly was baking bread but could only find her ⅛ cup measuring cup. She needs ¼ cup sugar, ¾ cup whole wheat flour, and ½ cup all-purpose flour. How many ⅛ cups will she need for each ingredient?
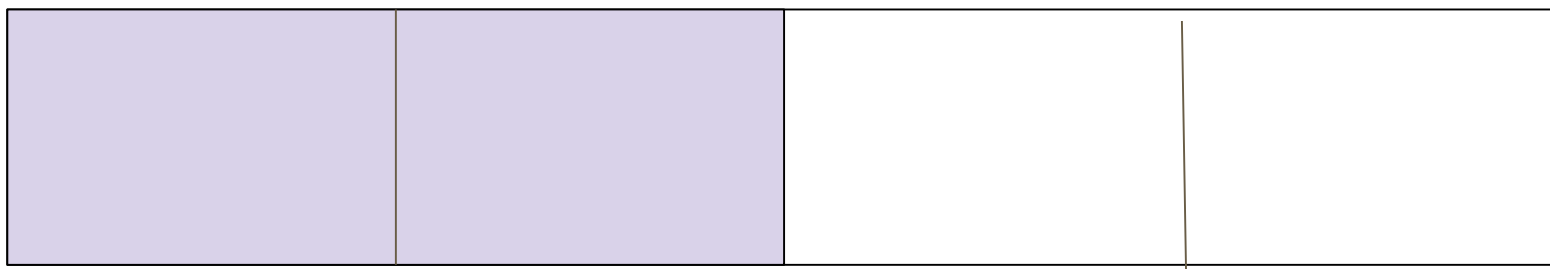
Use a tape diagram and number line to find equivalent fractions for halves, fourths, and eighths.

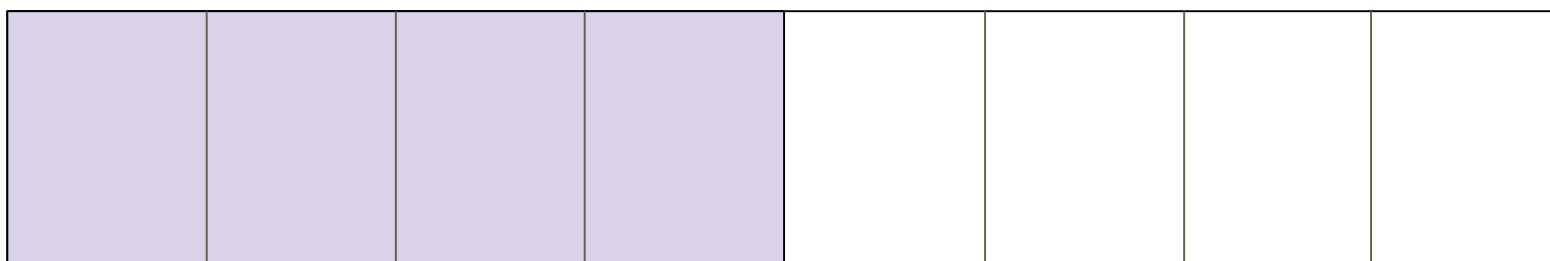Draw a tape diagram to show 1 partitioned into halves. Shade ½ .
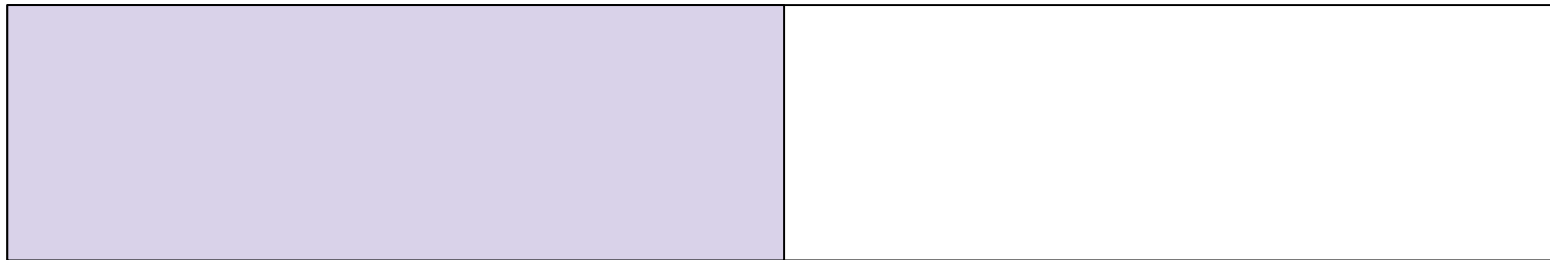
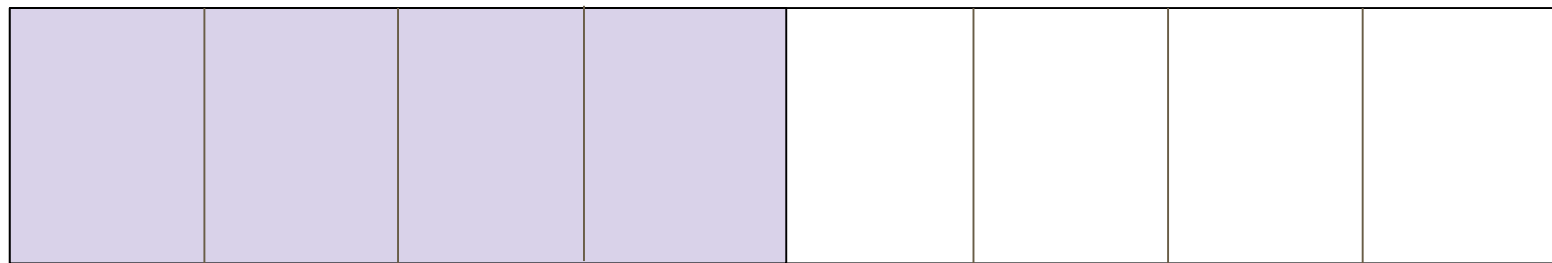Decompose halves to make fourths. How many fourths are shaded?

2 fourths

Decompose fourths to make eighths. How many eighths are shaded?

4 eighths

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$$

0   ⅛   ¼   ⅜   ½   ⅝   ¾   ⅞   1

²⁄₈   ²⁄₄   ⁶⁄₈   ⁴⁄₄

⁴⁄₈   ⁸⁄₈
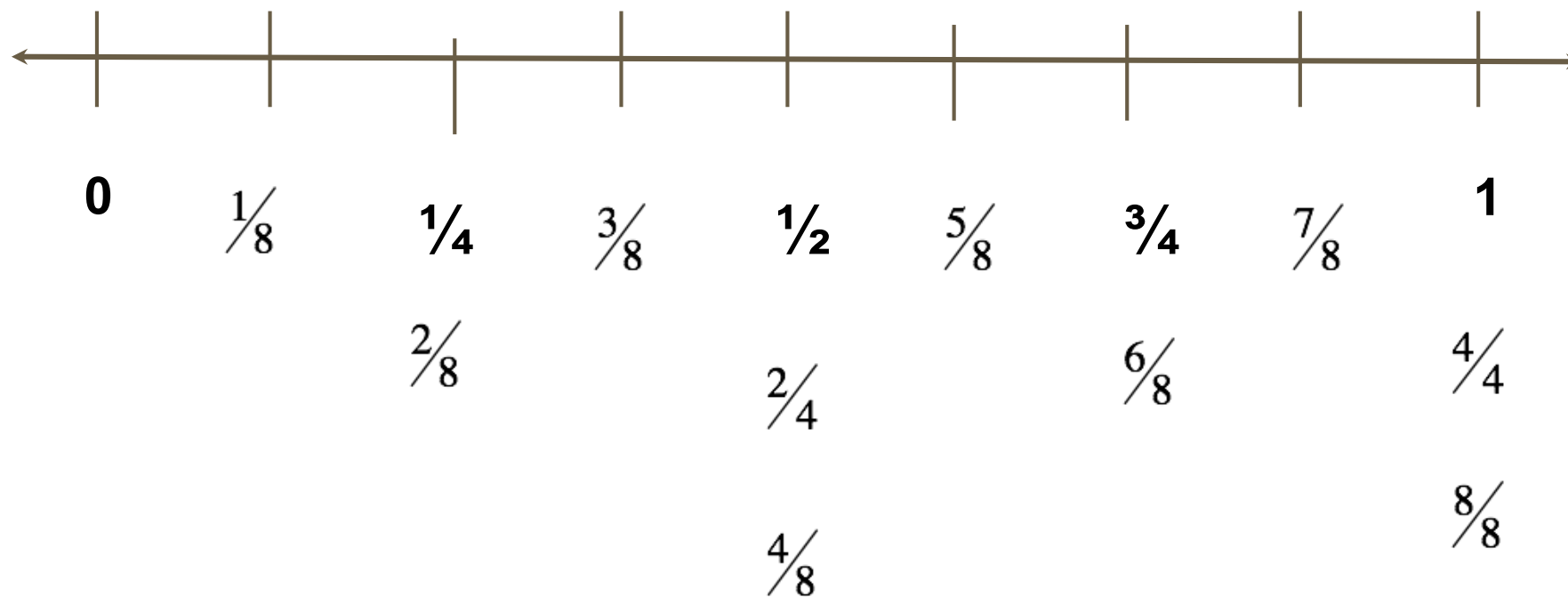
Use a ruler to draw a number line below the tape diagram. Label points 0 &1 so that they align with the ends of the tape diagram.

Label ½
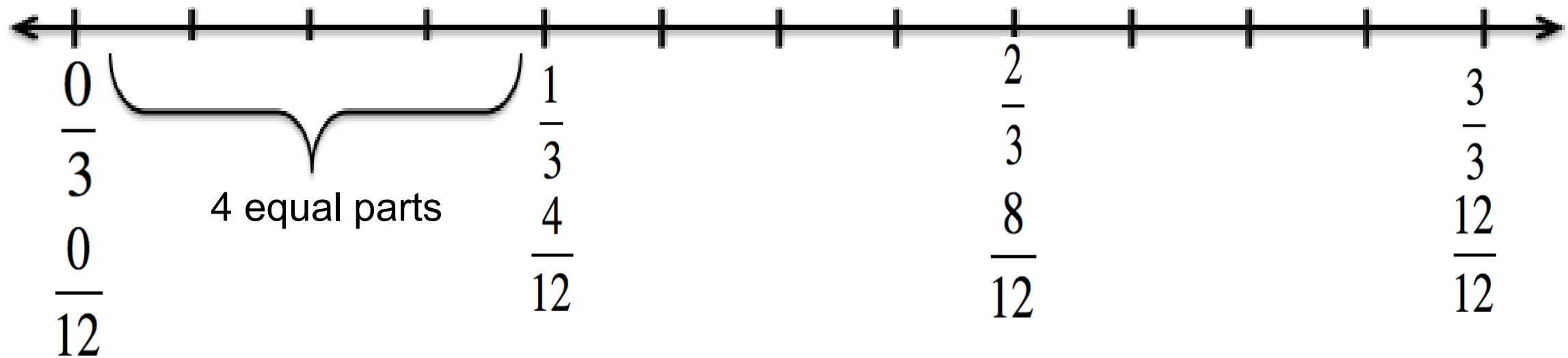.

Decompose into fourths. Label.

Decompose into eighths. Label.

Partition a number line into thirds. Decompose 1 third into 4 equal parts.

$$\frac{0}{3}$$ 4 equal parts $$\frac{1}{3}$$ $$\frac{2}{3}$$ $$\frac{3}{3}$$

$$\frac{0}{12}$$ $$\frac{4}{12}$$ $$\frac{8}{12}$$ $$\frac{12}{12}$$

Write a number sentence using multiplication to show what fraction is equivalent to 1 third on this number line.

$$\frac{1}{3} = \frac{1}{3} \, x \, \frac{4}{4} = \frac{4}{12}$$

Explain to your partner why this is true.

Write the equivalence as a number sentence using division.

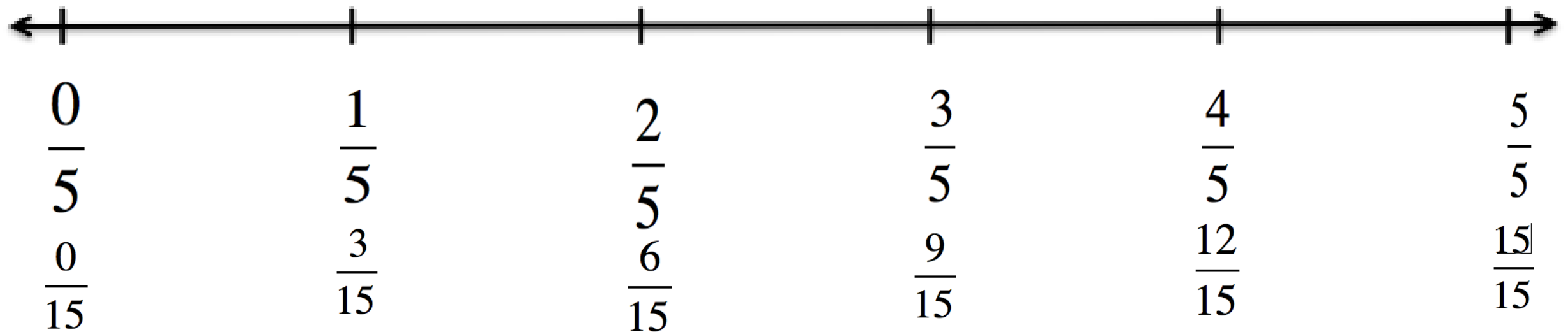$$\frac{4}{12} = \frac{4}{12} \div \frac{4}{4} = \frac{1}{3}$$

Explain to your partner why this is true.

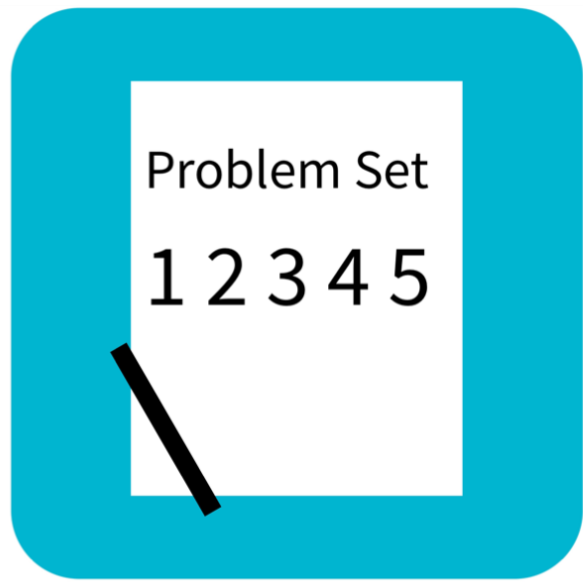**Decompose a non-unit fraction using a number line and division.**

Draw a number line. Partition it into fifths, label it, and locate ⅖ .

$$\frac{0}{5} \quad \frac{1}{5} \quad \frac{2}{5} \quad \frac{3}{5} \quad \frac{4}{5} \quad \frac{5}{5}$$

$$\frac{0}{15} \quad \frac{3}{15} \quad \frac{6}{15} \quad \frac{9}{15} \quad \frac{12}{15} \quad \frac{15}{15}$$

How do you decompose ⅖ into 6 equal parts? Model this on the number line.

Write a number sentence to express the equivalent fractions.

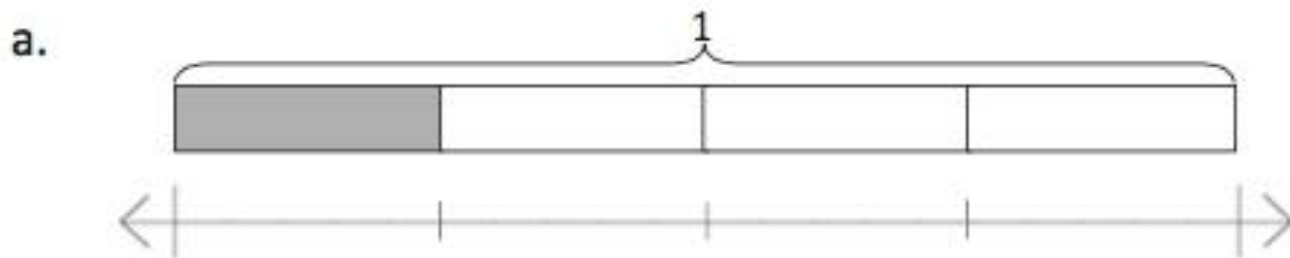$$\frac{2}{5} = \frac{2}{5} x \frac{3}{3} = \frac{6}{15}$$

Problem Set

Name _____   Date _____

1. Label each number line with the fractions shown on the tape diagram. Circle the fraction that labels the point on the number line that also names the shaded part of the tape diagram.

    a.

Debrief

- In Problem 1, compare the distance from 0 to each point on the number line you circled. What do you notice?

- In Problem 1, does the unshaded portion of the tape diagram represent the same length from the point to 1 on every number line? How do you know?

- Compare your number sentences in Problem 2. Could they be rewritten using division?

Debrief

- In Problem 5, what new units were created when 2 fifths was decomposed into 4 equal parts?

- How is modeling with a number line similar to modeling with an area model? How is it different?

- In Grade 3, you found equivalent fractions by locating them on a number line. Do you now require a number line to find equivalent fractions? What other ways can you determine equivalent fractions?

Exit Ticket

Name _____   Date _____

1. Partition a number line from 0 to 1 into sixths. Decompose $\frac{2}{6}$ into 4 equal lengths.

2. Write a number sentence using multiplication to show what fraction represented on the number line is equivalent to $\frac{2}{6}$.