Eureka Math

4th Grade
Module 5
Lesson 9

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 9

Objective: Use the area model and division to show the equivalence of two fractions.

Suggested Lesson Structure

■ Fluency Practice	(12 minutes)	
■ Application Problem	(6 minutes)	
■ Concept Development	(32 minutes)	
■ Student Debrief	(10 minutes)	
Total Time	**(60 minutes)**	

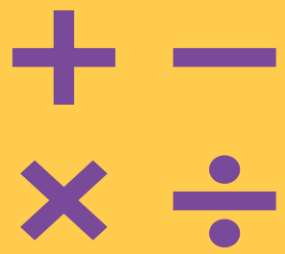Use the area model and division to show the equivalence of two fractions.

Add and Subtract

532 thousands 367 ones

Write this number in standard form

423 thousands 142 ones

Add this number to 532,367 using the standard algorithm

➕➖✖️➗ Find Equivalent fractions

Write $\dfrac{1}{2} = \dfrac{\times}{\times} = \dfrac{2}{\quad}$. Point to $\dfrac{1}{2}$.
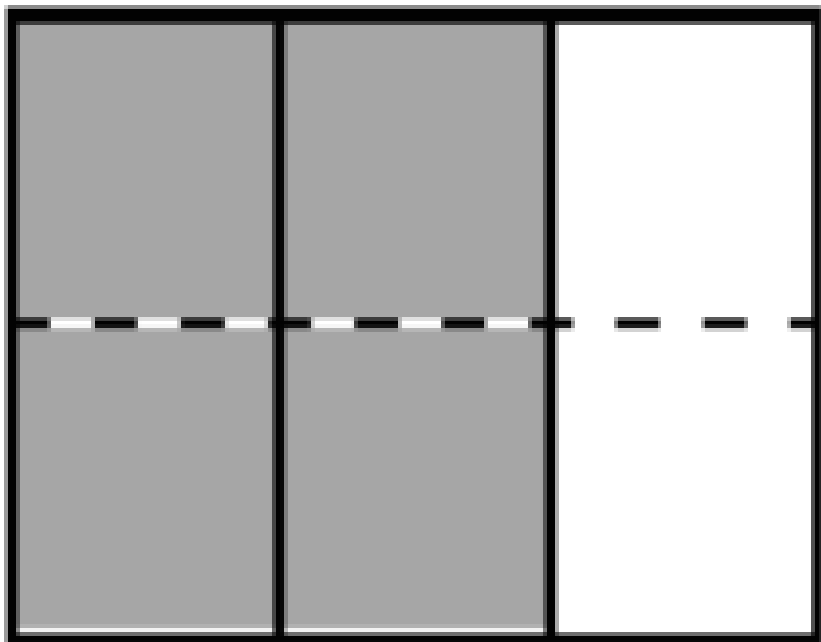
- Say the unit fraction.
- Complete the number sentence to make an equivalent fraction.

$$\dfrac{1}{2} = \dfrac{1 \times 2}{2 \times 2} = \dfrac{2}{4}.$$

➕➖✖️➗ Draw Equivalent fractions

- Draw a model to show 2/3
- Draw a dotted horizontal line to find the equivalent fraction. Then, complete the number sentence.

$$\frac{2}{3} = \frac{}{} \, x \, \frac{}{} = \frac{}{6}$$

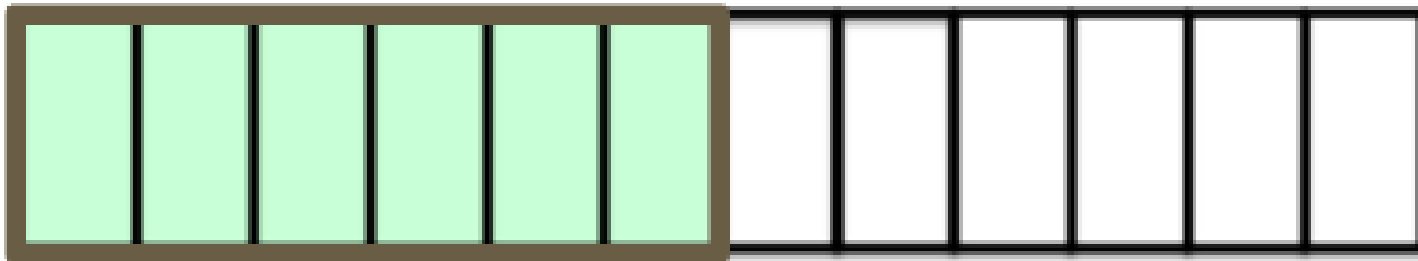$$\frac{2}{3} = \frac{2x2}{3x2} = \frac{4}{6}$$

Application Problem

What fraction of a foot is 1 inch? What fraction of a foot is 3 inches? (Hint: 12 inches = 1 foot)
Draw a tape diagram to model your work.

Problem 1: Simplify $\frac{6}{12}$ by composing larger fractional units using division.

- What fraction does the area model represent?
- Do you see any fractions equivalent to 6/12?
- Which is the larger unit? Twelfths or halves?
- Circle the smaller units to make the larger units. Say the equivalent fractions.

- 12 units were in the whole, and we made groups of 6 units. Say a division sentence to record that. $12 \div 6 = 2$

- 6 units were selected, and we made a group of 6 units. Say a division sentence to record that. $6 \div 6 = 1$

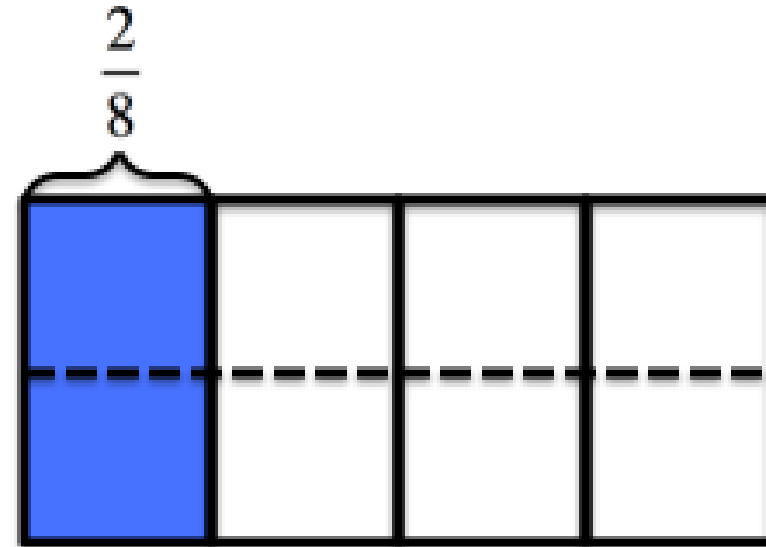- Divide both the numerator and denominator by 6 to find an equivalent fraction.

$$\frac{6}{12} = \frac{6 \div 6}{12 \div 6} = \frac{1}{2}$$

- What happened to the size of the units and the total number of units?

Simplify both 2/8 and 3/12 as ¼ by composing larger fractional units using division.

Draw an area model to represent 2/8. Group two units to make larger units.

How many groups of 2 are shaded?   1

How many groups of 2 are in the whole?   4

$$\frac{2}{8} = \frac{2 \div 2}{8 \div 2} = \frac{?}{?}$$

$$\frac{2}{8} = \frac{2 \div 2}{8 \div 2} = \frac{1}{4}$$
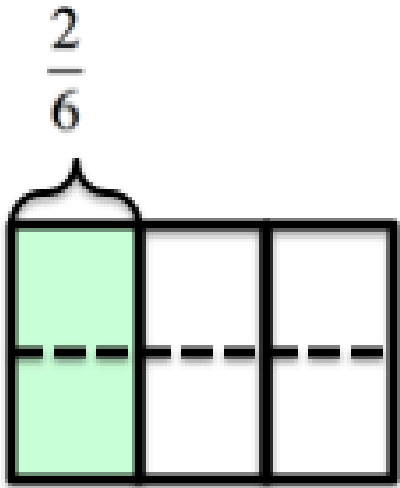
Look at how we showed that 2 eighths is the same as 1 fourth. Compare/contrast.

- When we composed fractions in the last two problems, what did you notice?

- Draw models to show 2/6 and 4/12.

- Rename both fractions as the same unit fraction.

- Circle the groups, and express each composition in a number sentence using division

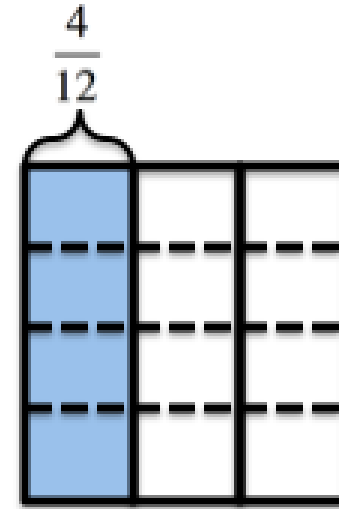**Simplify both 2/6 and 4/12 by composing larger fractional units.**
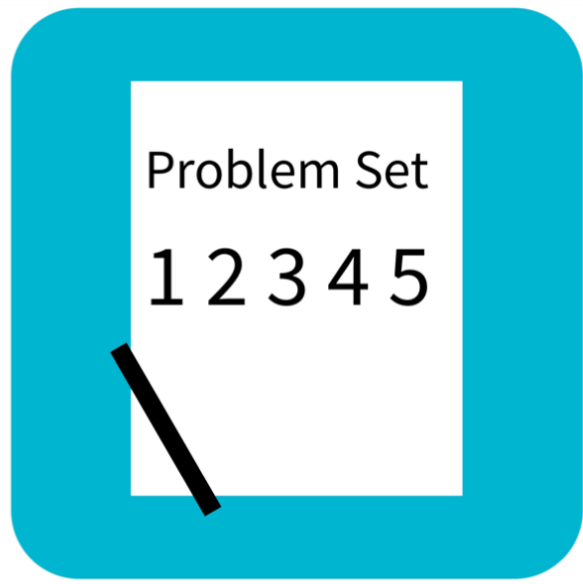
$\frac{2}{6}$

$\frac{4}{12}$

$$\frac{2}{6} = \frac{2 \div 2}{6 \div 2} = \frac{?}{?}$$

$$\frac{4}{12} = \frac{4 \div 4}{12 \div 4} = \frac{?}{?}$$

$$\frac{2}{6} = \frac{2 \div 2}{6 \div 2} = \frac{1}{3}$$

$$\frac{4}{12} = \frac{4 \div 4}{12 \div 4} = \frac{1}{3}$$
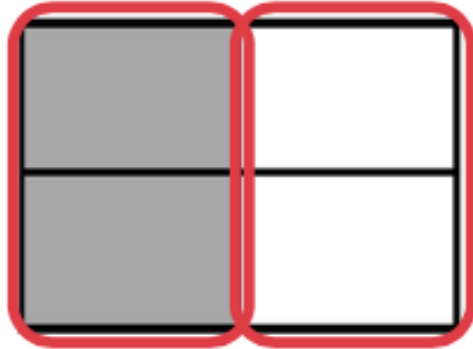
They BOTH equal ⅓.

Problem Set

Problem Set

1 2 3 4 5

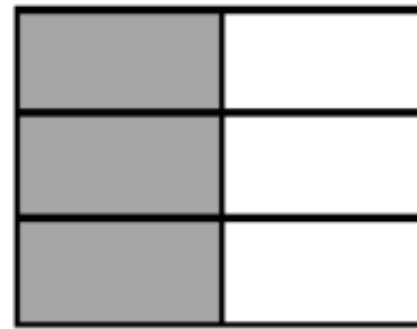Name _____   Date _____

Each rectangle represents 1.

1. Compose the shaded fractions into larger fractional units. Express the equivalent fractions in a number sentence using division. The first one has been done for you.

a.

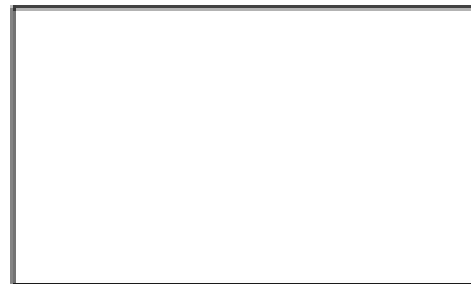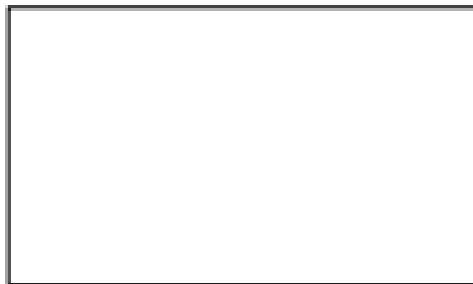$$\frac{2}{4} = \frac{2 \div 2}{4 \div 2} = \frac{1}{2}$$

b.

Debrief

- Look at Problem 1(a–d). Write some examples of fractions where the denominator is a multiple of the numerator. (Pause.) What do we know about these fractions?

- In Problems 3 and 4, does it matter how your area models are shaded? Will it still result in a correct answer?

- Explain how two fractions can be composed into the same larger unit fraction.

- How can what you know about factors help rename a fraction in larger units?

- When we rename $\frac{3}{12}$ as $\frac{1}{4}$, why is it helpful to think about the factors of 3 and 12?

- Use what you learned today to determine if $\frac{3}{8}$ can be renamed as a larger unit. Why or why not?

Exit Ticket

Name _____   Date _____

a. In the first area model, show 2 sixths. In the second area model, show 4 twelfths. Show how both fractions can be composed, or renamed, as the same unit fraction.

b. Express the equivalent fractions in a number sentence using division.