Eureka Math

4th Grade
Module 5
Lesson 10

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!

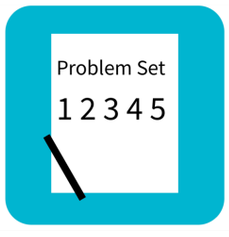
Directions for customizing presentations are available on the next slide.

Icons

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 10

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

Suggested Lesson Structure

Fluency Practice	(12 minutes)
Application Problem	(8 minutes)
Concept Development	(30 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**

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

Count by Equivalent Fractions

Count by threes to 24. Start at 0

Count by 3 fourths to 24 fourths. (write as students count)

1 is the same as how many fourths?

2 is the same as how many fourths?

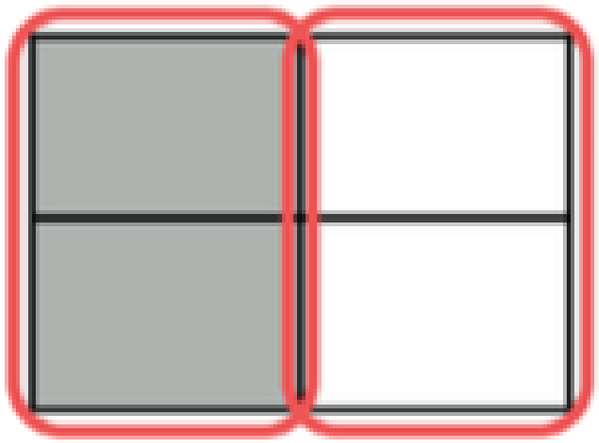
Continue until “6 is the same as”

Find Equivalent fractions

$$\frac{3}{4} = \frac{x}{x} = \frac{\quad}{8}$$

- Complete the number sentence to make an equivalent fraction.

Draw Equivalent fractions



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

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

- Compose the shaded units into 1 larger unit by circling. Then, complete the number sentence.

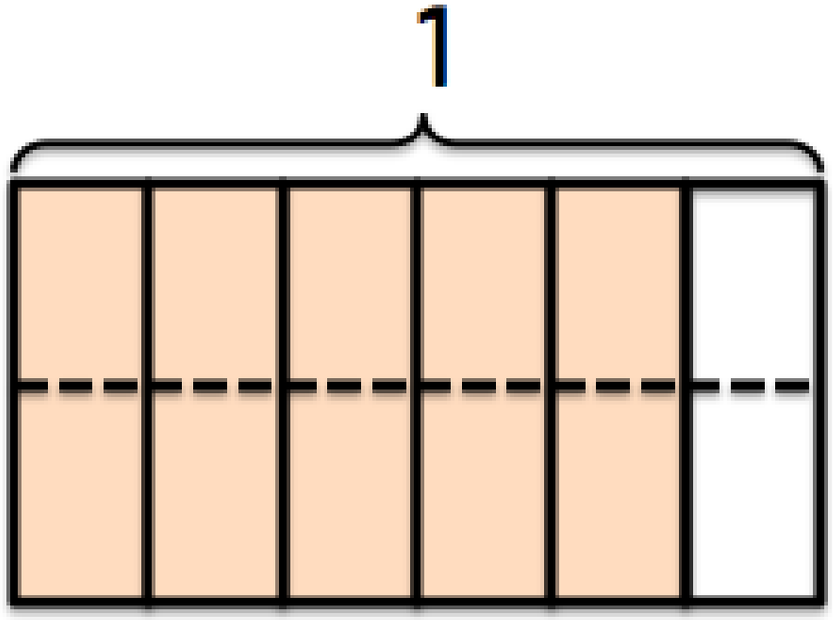
Application Problem

Nuri spent $\frac{9}{12}$ of his money on a book and the rest of his money on a pencil.

a) Express how much of his money he spent on the pencil in fourths.
b) Nuri started with $1. How much did he spend on the pencil?

Simplify a fraction by drawing to find a common factor, and relate it to division.

Draw an area model that shows $\frac{10}{12}$.



If we want to compose an equivalent fraction, what do we do?

Can I divide both the numerator and denominator by 10?

Discuss with your partner how to determine the largest possible unit.

Discuss: What happened to the number of shaded units?

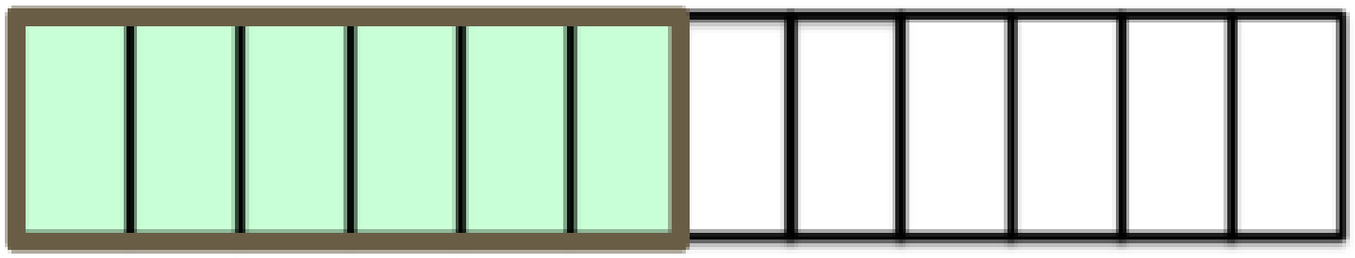
Simplify a fraction by drawing to find a common factor, and relate it to division.

Consider the unit fractions

$\frac{1}{12}$ and $\frac{1}{6}$.

- What do you notice about their denominators?
- What about the numerators 10 and 5?
- List the factors of 10 and 12

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.

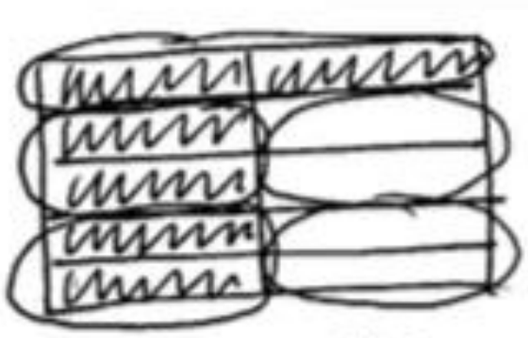
$$\frac{6}{12} = \frac{6 \div 6}{12 \div 6} = \frac{1}{2}$$

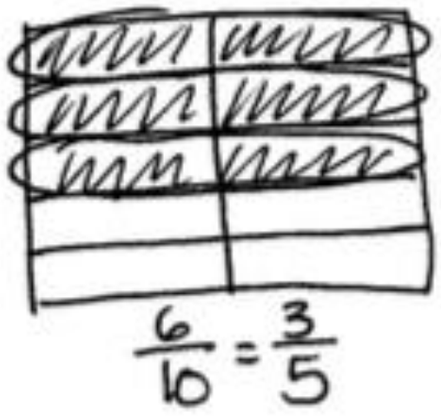
- What happened to the size of the units and the total number of units?

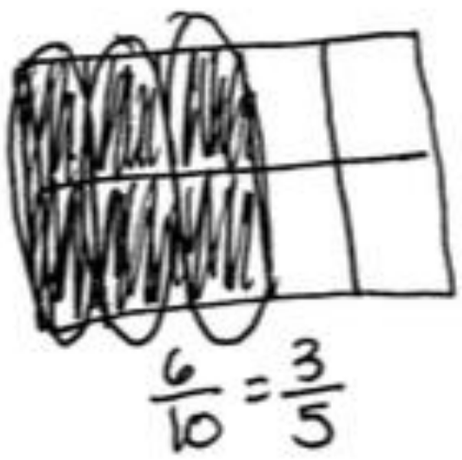
Draw an area model of a number sentence that shows the simplification of a fraction.

$$\frac{6}{10} = \frac{6}{10} \div \frac{2}{2} = \frac{3}{5}$$

Draw an area model to show how this number sentence is true.







Simplify a fraction by drawing to find different common factors, and relate it to division.

Draw an area model to represent 8/12.
Rename 8/12 using larger fractional units.

What happens when I use 4 as a common factor instead of 2?

Express the equivalent fractions as two division number sentences.

$$\frac{8}{12} = \frac{8 \div 4}{12 \div 4} = \frac{2}{3}$$

$$\frac{8}{12} = \frac{8 \div 2}{12 \div 2} = \frac{4}{6}$$

- What can you conclude about ⅔ and 4/6?

- What is true about dividing the numerator and denominator in 8/12 by 2 or 4?

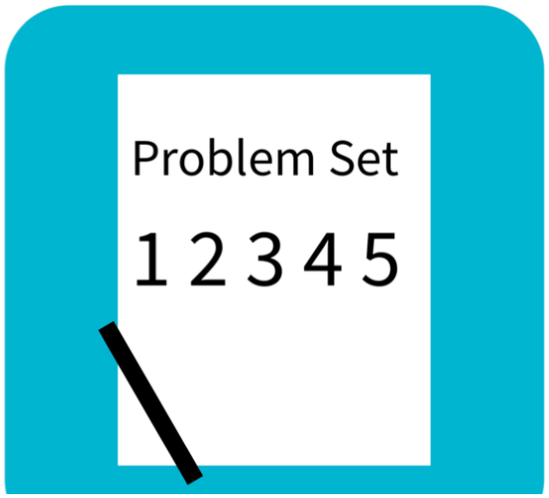
- Discuss: “The larger the factor, the larger the new fractional units.”

Simplify a fraction using the largest possible common factor.

- Discuss with your partner how to rename $\frac{8}{12}$ with the largest possible units possible without using an area model

- Express the equivalence using a division number sentence.

- How can we know we expressed an equivalent fraction with the largest units?



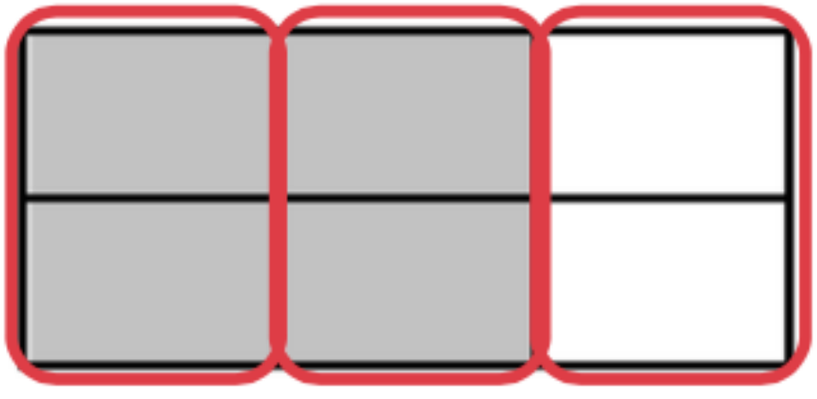
Problem Set

Name _____ Date _____

Each rectangle represents 1.

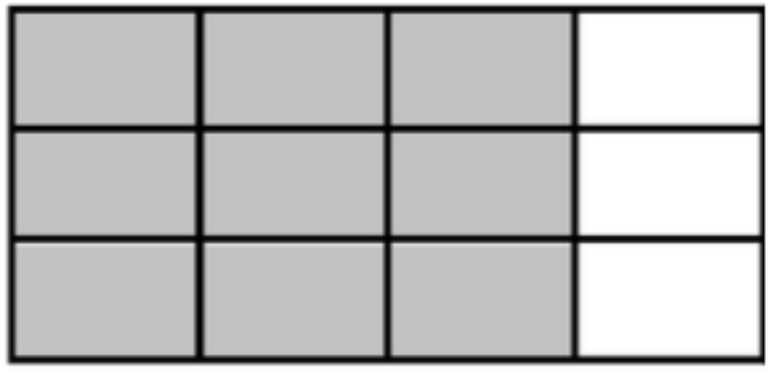
1. Compose the shaded fraction into larger fractional units. Express the equivalent fractions in a number sentence using division. The first one has been done for you.

a.



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

b.



Debrief

- In Problem 2(b), did you compose the same units as your partner? Are both of your answers correct? Why?
- In Problem 4(a–d), how is it helpful to know the common factors for the numerators and denominators?
- In Problem 4, you were asked to use the largest common factor to rename the fraction: $\frac{4}{8} = \frac{1}{2}$. By doing so, you renamed $\frac{4}{8}$ using larger units. How is renaming fractions useful?
- Do fractions always need to be renamed to the largest unit? Explain.

Debrief

- Why is it important to choose a common factor to make larger units?
- How can you tell that a fraction is composed of the largest possible fractional units?
- When you are drawing an area model and circling equal groups, do all of the groups have to appear the same in shape? How do you know that they still show the same amount?
- Explain how knowing the factors of the numerator and the factors of the denominator can be helpful in identifying equivalent fractions of a larger unit size.

Exit Ticket

Name _____ Date _____

Draw an area model to show why the fractions are equivalent. Show the equivalence in a number sentence using division.

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