Eureka Math

4th Grade
Module 5
Lesson 23

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!

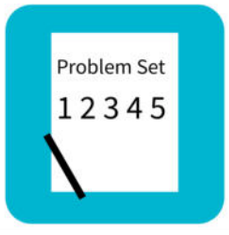
Directions for customizing presentations are available on the next slide.

Icons

Read, Draw, Write

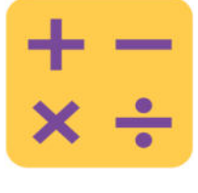
Learning Target

Personal White Board



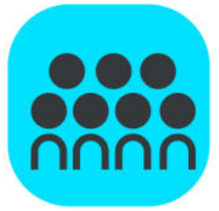
Problem Set

Manipulatives Needed



Fluency

Think Pair Share



Whole Class

Individual

Partner

Small Group

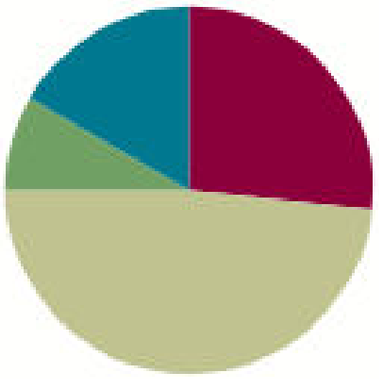
Small Group Time

Lesson 23

Objective: Add and multiply unit fractions to build fractions greater than 1 using visual models.

Suggested Lesson Structure

Fluency Practice	(16 minutes)
Application Problem	(5 minutes)
Concept Development	(29 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**



Add a fraction less than 1 to, or subtract a fraction less than 1 from, a whole number using decomposition and visual models.

Add and Subtract

using the standard algorithm

457 thousands 393 ones plus 385 thousands 142 ones

385 thousands 142 ones plus 457, 393

300 thousands minus 137 thousands 623 ones

534,803 - 235,257

Count by Equivalent fractions

- Count by twos to 12 starting at 0.
- Count by 2 sixths to 12 sixths starting at 0 sixths.
- 1 is the same as how many sixths? Record.
- 2 is the same as how many sixths? Record.
- Count by 2 sixths again. This time, when you come to the whole number, say the whole number.

Count by Equivalent fractions

- Say 8 sixths as a mixed number.
- Continue the process to create mixed numbers.
- Count by 2 sixths again. This time, convert to whole numbers and mixed numbers. (Write as students count.)

$\frac{0}{6}$	$\frac{2}{6}$	$\frac{4}{6}$	$\frac{6}{6}$	$\frac{8}{6}$	$\frac{10}{6}$	$\frac{12}{6}$
0	$\frac{2}{6}$	$\frac{4}{6}$	1	$\frac{8}{6}$	$\frac{10}{6}$	2
0	$\frac{2}{6}$	$\frac{4}{6}$	1	$1\frac{2}{6}$	$1\frac{4}{6}$	2

Add and Subtract Fractions

- How many fifths are in 1 whole?
- Write the number sentence to solve the expression 2 - ⅖ .

$$2-\frac{2}{5}=1+\frac{3}{5}=1\frac{3}{5}$$

Add and Subtract from Ones

$$1 + \frac{1}{4}$$

- Write the complete number sentence.
- Repeat for $2 + \frac{3}{5}$ and $3 + \frac{3}{10}$

$$2 - \frac{1}{3}$$

- Draw a number line to match the subtraction problem. Write the complete number sentence.
- Repeat with $3 - \frac{3}{4}$ and $3 - \frac{7}{10}$

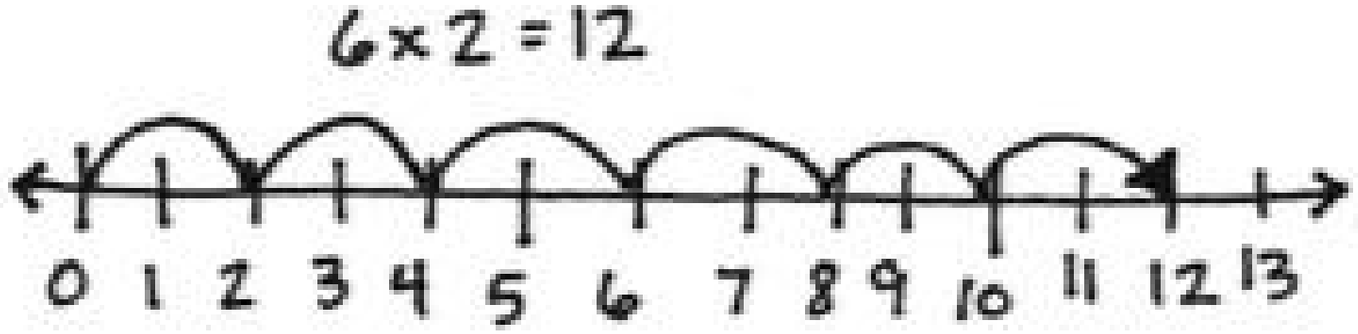
Application Problem

Mrs. Wilcox cut quilt squares, and then divided them evenly into 8 piles. She decided to sew together 1 pile each night. After 5 nights, what fraction of the quilt squares was sewn together?

Draw a tape diagram or a number line to model your thinking and then write a number sentence to express your answer.

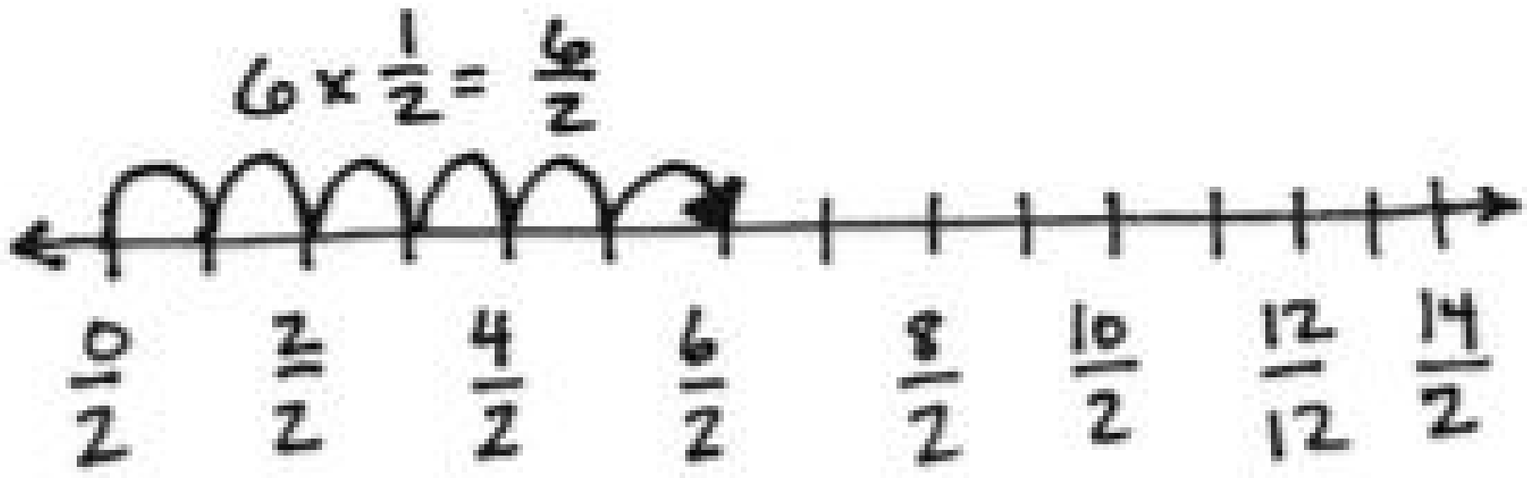
Multiply a whole number times a unit fraction.

Write 6 x 2 as an addition sentence showing six groups of 2.
Draw a number line to show 6 twos.



Write 6 x ½ as an addition sentence showing six groups of ½.

Draw a number line to show 6 halves.



Multiply a whole number times a unit fraction.

$$6x\frac{1}{2} = \frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}$$

Work with your partner to draw parentheses, grouping halves to make ones.

$$6 \times \frac{1}{2} = \left(\frac{1}{2}+\frac{1}{2}\right)+\left(\frac{1}{2}+\frac{1}{2}\right)+\left(\frac{1}{2}+\frac{1}{2}\right)$$

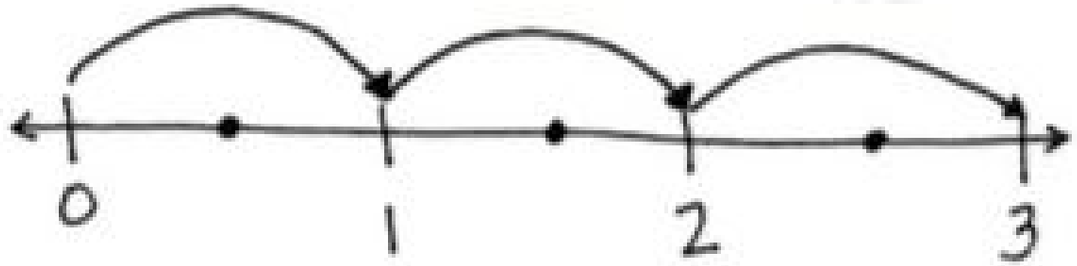
3 groups of 2/2 is equal to _____ ?

True or False?
Discuss.

$$6 \times \frac{1}{2} = 3 \times \frac{2}{2}.$$

Multiply a whole number times a unit fraction using the associative property.

Let's solve $6 \times \frac{1}{2}$ using unit form. $6 \times \frac{1}{2}$ is 6 halves.



How does this show three groups of 2 halves?

$6 \text{ halves} = (3 \times 2) \text{ halves} = 3 \times (2 \text{ halves}) = 3 \times \left(\frac{2}{2}\right) = 3 \times 1 = 3$

Discuss the above equation.
Why did it start with (3x2) halves? Why not (2 x 3) halves?

Repeat for 10 x ⅕

Express the product of a whole number times a unit fraction as a mixed number.

9 copies of ¼

How many fourths make 1?

To make ones, how many 4 fourths are in 9 fourths?

Two groups of 4 fourths makes 8 fourths. There is 1 fourth remaining.

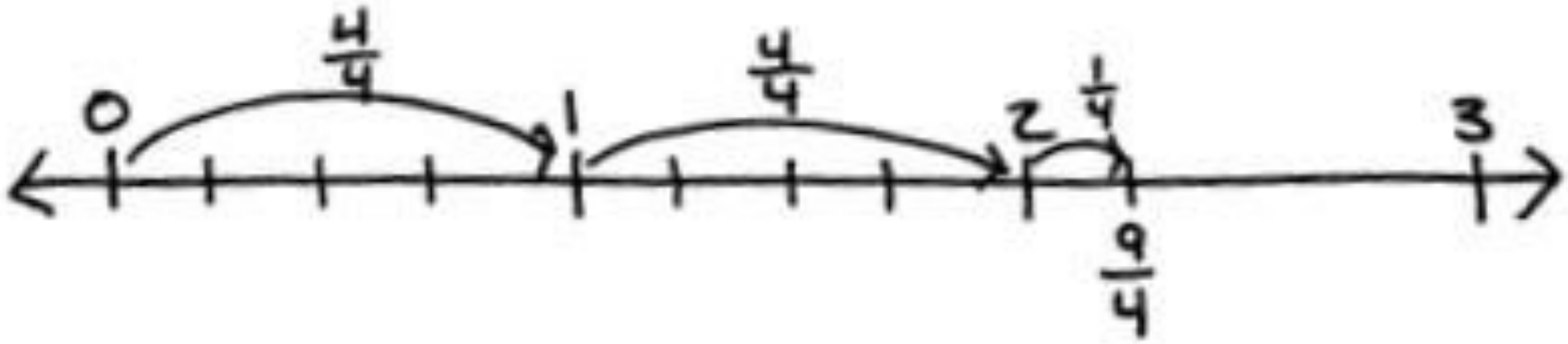
$$9 \times \frac{1}{4} = \left(2 \times \frac{4}{4}\right) + \frac{1}{4} = 2 + \frac{1}{4} = 2\frac{1}{4}.$$

Express the product of a whole number times a unit fraction as a mixed number.

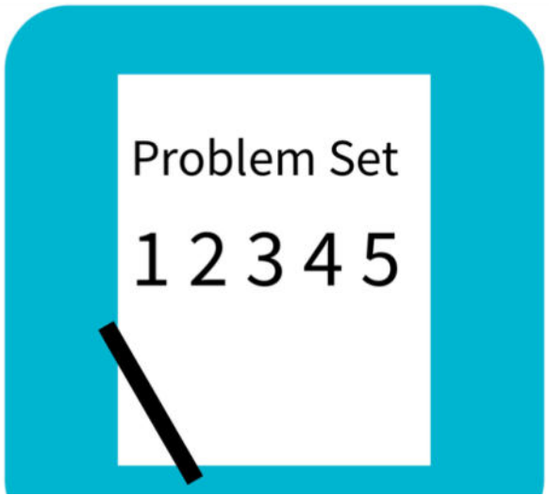
$$9 \times \frac{1}{4} = \left(2 \times \frac{4}{4}\right) + \frac{1}{4} = 2 + \frac{1}{4} = 2\frac{1}{4}.$$

Draw a number line with endpoints 0 and 3. Label the ones and partition fourths..

With your partner, show (2 x 4/4) + ¼



$$9 \times \frac{1}{4} = \left(2 \times \frac{4}{4}\right) + \frac{1}{4} = 2 + \frac{1}{4} = 2\frac{1}{4}$$



Problem Set

Name _____ Date _____

1. Circle any fractions that are equivalent to a whole number. Record the whole number below the fraction.

   a. Count by 1 thirds. Start at 0 thirds. End at 6 thirds.

   $\frac{0}{3}, \frac{1}{3},$

   0

   b. Count by 1 halves. Start at 0 halves. End at 8 halves.

2. Use parentheses to show how to make ones in the following number sentence.

$$\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=3$$

Debrief

- How is your work in Problem 1(a) related to your work in Problem 3(a)? How is adding like-unit fractions related to multiplying unit fractions? Is this true for Problems 1(b) and 3(b)?
- Using Problem 3(a), explain how $6 \times \frac{1}{3}$ is the same as $2 \times \frac{3}{3}$.
- Explain why Problems 3(b) and 3(c) equal the same whole number.
- Which is greater, $6 \times \frac{1}{3}$ or $6 \times \frac{1}{2}$?
- How are parentheses helpful as you solve Problem 2?
- Look at Problem 2 and Problem 3. Is there a way to tell when the product will be a whole number before multiplying? Explain your thinking.
- How did the Application Problem connect to today's lesson?

Exit Ticket

Name _____ Date _____

Multiply and write the product as a mixed number. Draw a number line to support your answer.

1. $8 \times \frac{1}{2}$