Learning Objective: Students will be able to use a model and a formal rule to divide with mixed numbers.

Warm Up

1. $\dfrac{5}{6} \times \dfrac{1}{2}$

5. $\dfrac{7}{9} \times \dfrac{1}{2}$

9. $\dfrac{1}{2} \times \dfrac{1}{3}$

2. $\dfrac{4}{9} \times \dfrac{2}{3}$

6. $\dfrac{5}{11} \times \dfrac{1}{3}$

10. $\dfrac{1}{8} \times \dfrac{1}{4}$

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Warm Up Answers

1. $\dfrac{5}{6} \times \dfrac{1}{2}$

   $= \dfrac{5}{12}$

5. $\dfrac{7}{9} \times \dfrac{1}{2}$

   $= \dfrac{7}{18}$

9. $\dfrac{1}{2} \times \dfrac{1}{3}$

   $= \dfrac{1}{6}$

2. $\dfrac{4}{9} \times \dfrac{2}{3}$

   $= \dfrac{8}{27}$

6. $\dfrac{5}{11} \times \dfrac{1}{3}$

   $= \dfrac{5}{33}$

10. $\dfrac{1}{8} \times \dfrac{1}{4}$

    $= \dfrac{1}{32}$

Learning Objective: Students will be able to use a model and a formal rule to divide with mixed numbers.

Homework Answers

2.2 Record and Practice Journal

Complete the statement.

1. $\dfrac{3}{8} \times \underline{\dfrac{8}{3}} = 1$

2. $7 \times \underline{\dfrac{1}{7}} = 1$

3. $3 \div \underline{\dfrac{1}{12}} = 36$

4. $\dfrac{4}{9} \div \underline{\dfrac{1}{27}} = 12$

Evaluate the expression.

5. $\dfrac{1}{3} \div \dfrac{1}{6}$

2

6. $\dfrac{3}{8} \div \dfrac{5}{8}$

$\dfrac{3}{5}$

7. $6 \div \dfrac{2}{5}$

15

8. $\dfrac{4}{9} \div \dfrac{2}{3} \div \dfrac{5}{6}$

$\dfrac{4}{5}$

9. $\dfrac{1}{3} + \dfrac{4}{7} \div \dfrac{3}{10}$

$2\dfrac{5}{21}$

10. $\dfrac{7}{8} \cdot \dfrac{4}{5} \div \dfrac{7}{20}$

2

11. In a jewelry store, rings make up $\dfrac{5}{9}$ of the inventory. Earrings make up $\dfrac{4}{15}$ of the inventory. How many times greater is the ring inventory than the earring inventory?

$2\dfrac{1}{12}$

Learning Objective: Students will be able to use a model and a formal rule to divide with mixed numbers.

Lesson 2.3   October 8, 2014

Essential Question:

How can you model division by a mixed number?

Lesson 2.3   October 8, 2014

Lesson Objective:

Students will be able to:

use a model and a formal rule to divide with mixed numbers.

Self-Evaluation Scale

Score	Description
4	I can teach other students how to use a model and a formal rule to divide with mixed numbers.
3	I can use a model and a formal rule to divide with mixed numbers.
2	I recognize, but still need help to use a model and a formal rule to divide with mixed numbers.
1	I do not know how to use a model and a formal rule to divide with mixed numbers.

**October 8, 2014 Period 4 Lesson 2.3**

Activity 1 & 2

With a partner, work on Activity 1 & 2 on pages 39 & 40 of your Big Ideas Record and Practice Journal.

Learning Objective: Students will be able to use a model and a formal rule to divide with mixed numbers.
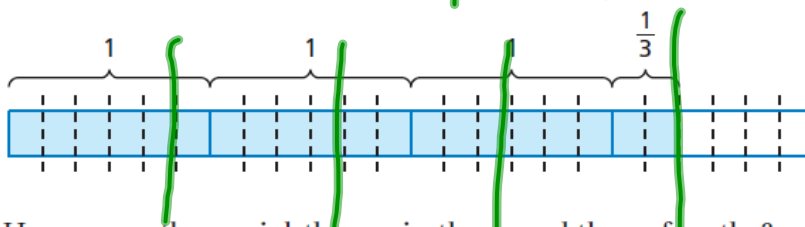
2 ACTIVITY: Dividing Mixed Numbers

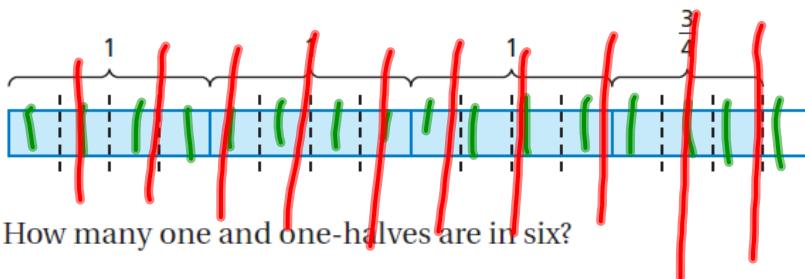Work with a partner. Write the division problem and solve it using a model.

a. How many three-fourths are in four and one-half?
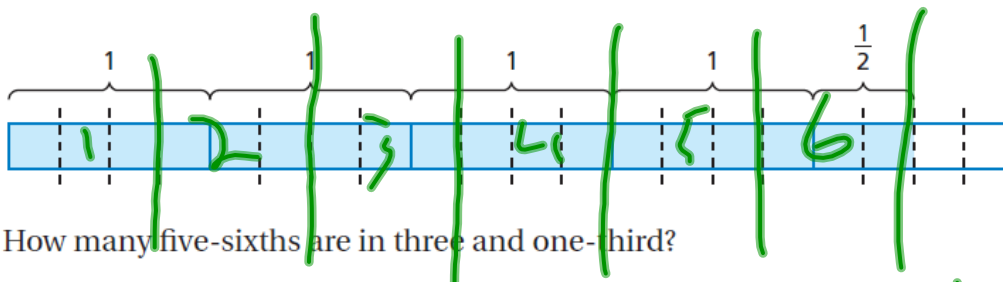
b. How many five-sixths are in three and one-third?

c. How many three-eighths are in three and three-fourths?

d. How many one and one-halves are in six?

e. How many one and one-fifths are in five?

f. How many one and one-fourths are in four and one-half?

g. How many two and one-thirds are in five and five-sixths?

October 8, 2014 Period 4 Lesson 2.3

$$10 \div 5 = \frac{\cancel{10}^{2}}{1} \cdot \frac{1}{\cancel{5}_{1}} = \frac{2}{1} = 2$$

🔑 Key Idea

Dividing Mixed Numbers

Write each mixed number as an improper fraction. Then divide as you would with proper fractions.

Learning Objective: Students will be able to use a model and a formal rule to divide with mixed numbers.

1 Dividing a Mixed Number by a Fraction
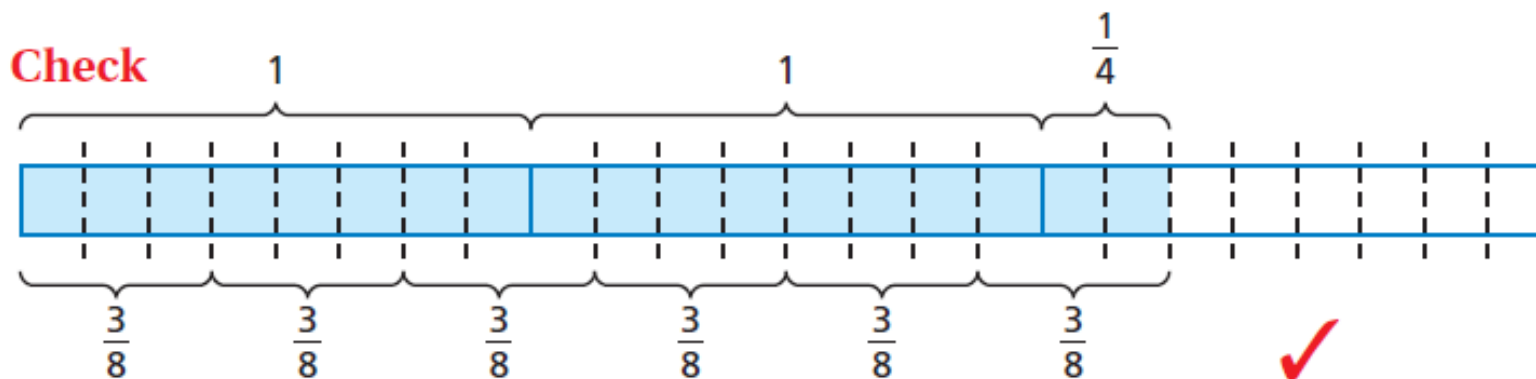
Find $2\dfrac{1}{4} \div \dfrac{3}{8}$.

$$2\frac{1}{4} \div \frac{3}{8} = \frac{9}{4} \div \frac{3}{8}$$

Write $2\dfrac{1}{4}$ as the improper fraction $\dfrac{9}{4}$.

$$= \frac{9}{4} \times \frac{8}{3}$$

Multiply by the reciprocal of $\dfrac{3}{8}$, which is $\dfrac{8}{3}$.

$$= \frac{\overset{3}{\cancel{9}} \times \overset{2}{\cancel{8}}}{\underset{1}{\cancel{4}} \times \underset{1}{\cancel{3}}}$$

Multiply fractions. Divide out common factors.

$$= 6$$

Simplify.

Check

Learning Objective: Students will be able to use a model and a formal rule to divide with mixed numbers.

First = Total of grouping
2nd = size of grouping

2 Dividing Mixed Numbers

Find $3\frac{5}{6} \div 1\frac{2}{3}$.

Estimate $4 \div 2 = 2$

$3\frac{5}{6} \div 1\frac{2}{3} = \frac{23}{6} \div \frac{5}{3}$

Write each mixed number as an improper fraction.

$= \frac{23}{6} \times \frac{3}{5}$

Multiply by the reciprocal of $\frac{5}{3}$, which is $\frac{3}{5}$.

$= \frac{23 \times \overset{1}{\cancel{3}}}{\underset{2}{\cancel{6}} \times 5}$

Multiply fractions. Divide out common factors.

$= \frac{23}{10}$, or $2\frac{3}{10}$

Simplify.

∴ So, the quotient is $2\frac{3}{10}$.

Reasonable? $2\frac{3}{10} \approx 2$ ✓

Learning Objective: Students will be able to use a model and a formal rule to divide with mixed numbers.

On Your Own

Divide. Write the answer in simplest form.

1. $1\frac{3}{7} \div \frac{2}{3}$

2. $2\frac{1}{6} \div \frac{3}{4}$

3. $8\frac{1}{4} \div 1\frac{1}{2}$

4. $6\frac{4}{5} \div 2\frac{1}{8}$

$$\frac{10}{7} \div \frac{2}{3}$$

$$\frac{10}{7} \times \frac{3}{2} = \frac{15}{7} = 2\frac{1}{7}$$

$$\frac{34}{5} \div \frac{17}{8}$$

$$\frac{34}{5} \cdot \frac{8}{17} = \frac{16}{5} = 3\frac{1}{5}$$

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3 Using Order of Operations

Evaluate $5\frac{1}{4} \div 1\frac{1}{8} - \frac{2}{3}$.

$5\frac{1}{4} \div 1\frac{1}{8} - \frac{2}{3} = \frac{21}{4} \div \frac{9}{8} - \frac{2}{3}$ Write each mixed number as an improper fraction.

$= \frac{21}{4} \times \frac{8}{9} - \frac{2}{3}$ Multiply by the reciprocal of $\frac{9}{8}$, which is $\frac{8}{9}$.

$= \frac{\overset{7}{\cancel{21}} \times \overset{2}{\cancel{8}}}{\underset{1}{\cancel{4}} \times \underset{3}{\cancel{9}}} - \frac{2}{3}$ Multiply $\frac{21}{4}$ and $\frac{8}{9}$. Divide out common factors.

$= \frac{14}{3} - \frac{2}{3}$ Simplify.

$= \frac{12}{3}$, or 4 Subtract.

Learning Objective: Students will be able to use a model and a formal rule to divide with mixed numbers.

4 **Real-Life Application**

One serving of tortilla soup is $1\frac{2}{3}$ cups. A restaurant cook makes 50 cups of soup. Is there enough to serve 35 people? Explain.

Divide 50 by $1\frac{2}{3}$ to find the number of available servings.

$$50 \div 1\frac{2}{3} = \frac{50}{1} \div \frac{5}{3}$$ Rewrite each number as an improper fraction.

$$= \frac{50}{1} \cdot \frac{3}{5}$$ Multiply by the reciprocal of $\frac{5}{3}$, which is $\frac{3}{5}$.

$$= \frac{\overset{10}{\cancel{50}} \cdot 3}{1 \cdot \underset{1}{\cancel{5}}}$$ Multiply fractions. Divide out common factors.

$$= 30$$ Simplify.

∴ No. Because 30 is less than 35, there is not enough soup to serve 35 people.

Learning Objective: Students will be able to use a model and a formal rule to divide with mixed numbers.

On Your Own

Evaluate the expression. Write the answer in simplest form.

5. $1\dfrac{1}{2} \div \dfrac{1}{6} - \dfrac{7}{8}$

6. $3\dfrac{1}{3} \div \dfrac{5}{6} + \dfrac{8}{9}$

7. $\dfrac{2}{5} + 2\dfrac{4}{5} \div 1\dfrac{3}{4}$

8. $\dfrac{2}{3} - 1\dfrac{4}{7} \div 4\dfrac{5}{7}$

9. In Example 4, can 30 cups of tortilla soup serve 15 people? Explain.

Learning Objective: Students will be able to use a model and a formal rule to divide with mixed numbers.

Assignment

Complete problems:

5, 10, 15, 20, 23, 24, 26, 30, 34, & 39

on pages 74 & 75 in your Big Ideas Text Book.

Learning Objective: Students will be able to use a model and a formal rule to divide with mixed numbers.

Lesson 2.3   October 8, 2014

Essential Question:

How can you model division by a mixed number?

Lesson 2.3

October 8, 2014

Lesson Objective:

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Self-Evaluation Scale

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October 8, 2014 Period 4 Lesson 2.3

Learning Objective: Students will be able to use a model and a formal rule to divide with mixed numbers.

Homework

In your Big Ideas Record and Practice Journal page 42.