October 8, 2014 Period 5 Lesson 2.3

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

Warm Up

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

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

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

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

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

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

October 8, 2014 Period 5 Lesson 2.3

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

Warm Up Answers

1. $\frac{5}{6} \times \frac{1}{2}$
$= \frac{5}{12}$

2. $\frac{4}{9} \times \frac{2}{3}$
$= \frac{8}{27}$

5. $\frac{7}{9} \times \frac{1}{2}$
$= \frac{7}{18}$

6. $\frac{5}{11} \times \frac{1}{3}$
$= \frac{5}{33}$

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

10. $\frac{1}{8} \times \frac{1}{4}$
$= \frac{1}{32}$

October 8, 2014 Period 5 Lesson 2.3

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. $\frac{3}{8} \times \frac{8}{3} = 1$

2. $7 \times \frac{1}{7} = 1$

3. $3 \div \frac{1}{12} = 36$

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

Evaluate the expression.

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

   2

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

   $\frac{3}{5}$

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

   15

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

   $\frac{4}{5}$

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

   $2\frac{5}{21}$

10. $\frac{7}{8} \bullet \frac{4}{5} \div \frac{7}{20}$

    2

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

    $2\frac{1}{12}$

October 8, 2014 Period 5 Lesson 2.3

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 5 Lesson 2.3

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

Activity 1 & 2

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

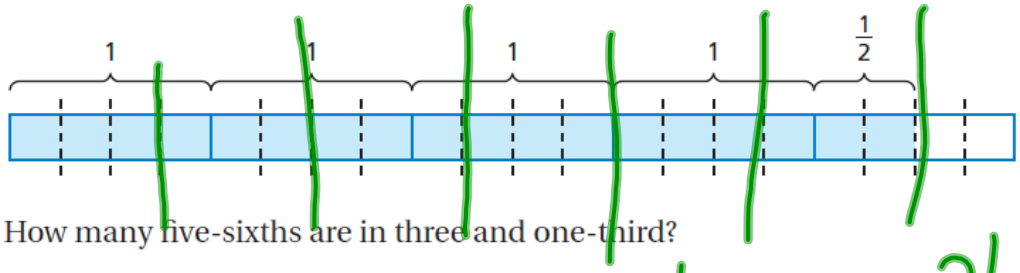
October 8, 2014 Period 5 Lesson 2.3

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.

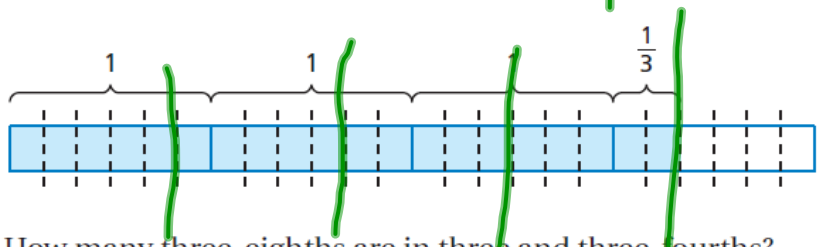
a. How many three-fourths are in four and one-half?



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

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

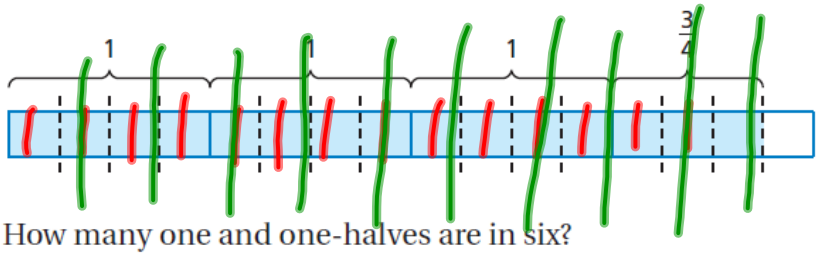
b. How many five-sixths are in three and one-third?



$3\frac{1}{3} \div \frac{5}{6} = 4$

$\frac{10}{3} \div \frac{5}{6} = \frac{2}{1} \cdot \frac{2}{1}$

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



$3\frac{3}{4} \div \frac{3}{8} = 10$

$\frac{15}{4} \div \frac{3}{8} = \frac{5}{1} \cdot \frac{2}{1}$

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 5 Lesson 2.3

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

Key Idea

Dividing Mixed Numbers

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

October 8, 2014 Period 5 Lesson 2.3

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

First = Total
2nd = Size

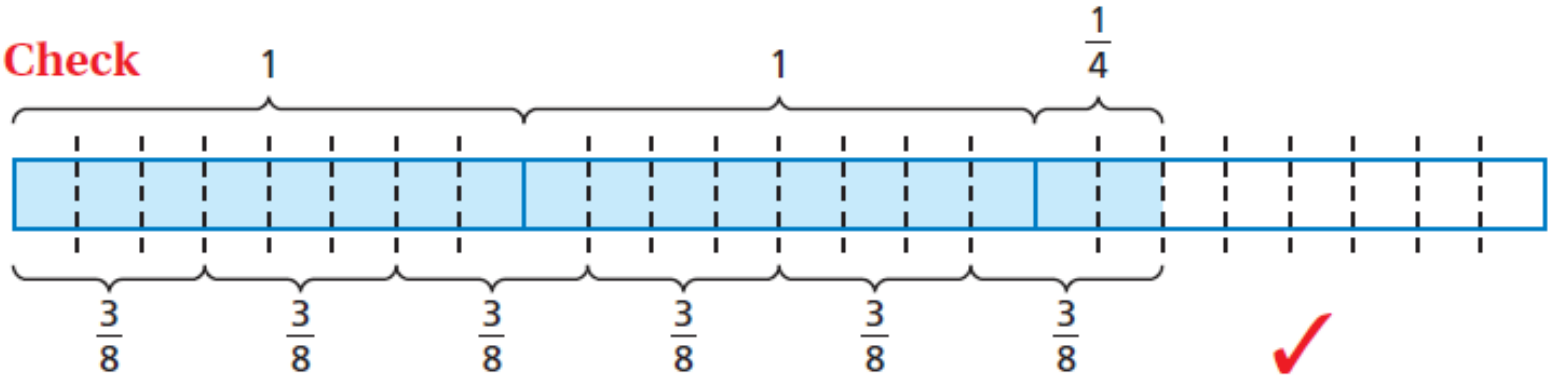
$$2\frac{1}{4} \div \frac{3}{8} = \frac{9}{4} \div \frac{3}{8}$$ Write $2\frac{1}{4}$ as the improper fraction $\frac{9}{4}$.

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

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

$$= 6$$ Simplify.

Check



✓

October 8, 2014 Period 5 Lesson 2.3

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

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 $\frac{3}{5}$.

$= \frac{23 \times \cancel{3}^{1}}{\cancel{6}_{2} \times 5}$ — Multiply fractions. Divide out common factors.

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

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

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

October 8, 2014 Period 5 Lesson 2.3

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

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

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

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

$\frac{15}{7} = 2\frac{1}{7}$

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

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

$2\frac{34}{5} \cdot \frac{8}{17}$

$\frac{16}{5} = 3\frac{1}{5}$

October 8, 2014 Period 5 Lesson 2.3

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

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 $\frac{8}{9}$.

$= \frac{\overset{7}{\cancel{21}} \times \cancel{8}^{2}}{\underset{1}{\cancel{4}} \times \cancel{9}_{3}} - \frac{2}{3}$ 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.

October 8, 2014 Period 5 Lesson 2.3

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.

October 8, 2014 Period 5 Lesson 2.3

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

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

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

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

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

October 8, 2014 Period 5 Lesson 2.3

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.

October 8, 2014 Period 5 Lesson 2.3

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 5 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.