Name: _____ Period: _____ Date: _____

Math Unit 2: Fractions and Decimals

Lesson 2.3- Dividing Mixed Numbers

SWBAT:	**Paraphrase:**

Essential Question: How can you model division by a mixed number?

Example 1

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

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

Example 2

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? $2\frac{3}{10} \approx 2$ ✓

Your Turn

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

Example 3	**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.
Your Turn	**Evaluate the expression. Write the answer in simplest form.** **5.** $1\frac{1}{2} \div \frac{1}{6} - \frac{7}{8}$ **6.** $3\frac{1}{3} \div \frac{5}{6} + \frac{8}{9}$
Example 4	**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.
Your Turn	One serving of French onion soup is $1\frac{3}{4}$ cups. A restaurant cook makes 75 cups of soup. Is there enough to serve 40 people?