Lesson Objective: Add and subtract whole numbers, fractions, and mixed numbers.

Vocabulary Box

greatest common factor (GCF) – The largest number that divides two or more numbers evenly. Examples: 3 is the GCF of 9 and 12; 5 is the GCF of 10 and 15.

improper fraction – A fraction with a numerator that is greater than or equal to the denominator. Examples: $\frac{8}{3}$; $\frac{10}{2}$.

least common denominator (LCD) – The least number other than zero that is a multiple of the denominators of two or more fractions; sometimes referred to as the LCM, least common multiple. Example: 18 is the LCD for $\frac{1}{6}$ and $\frac{1}{9}$.

simplest form – Lowest terms, reached when the GCF of the numerator and denominator of a fraction is 1. Examples: $\frac{6}{18}$ in simplest form is $\frac{1}{3}$; $\frac{10}{15}$ in simplest form is $\frac{2}{3}$.

equivalent fractions – Fractions that simplify to the same number. Examples: $\frac{4}{2}$ and $\frac{10}{5}$; $\frac{2}{3}$ and $\frac{4}{6}$.

Independent Practice

Directions: You will complete the following practice problems on your own. Then your teacher will review the answers. Make sure you show all your work.

I. Find the LCD and equivalent fractions with that LCD for the following sets of fractions.

1. $\frac{3}{4}$ and $\frac{2}{5}$
2. $\frac{5}{7}$ and $\frac{1}{4}$
3. $\frac{2}{3}$ and $\frac{5}{6}$

II. Solve each of the following problems. Make sure your answers are in simplest form.

1. $1\frac{1}{2} + 9\frac{7}{9}$

2. $12\frac{2}{3} - 8\frac{2}{6}$

3. $33\frac{1}{2} - 15\frac{3}{4}$

III. Complete the following by filling in the blank with the vocabulary terms from this session.

1. $\frac{25}{24}$ is an example of an _____.

2. $\frac{6}{8}$ and $\frac{12}{16}$ are _____.

3. 12 is the_____ for $\frac{1}{6}$ and $\frac{1}{4}$.

4. 4 is the_____ of 12 and 16.

1. $2\frac{1}{6} + 1\frac{2}{3} + 4\frac{1}{8}$

2. $10 - 2\frac{5}{8}$

Problem Solving

Think about the strategy you will use for each of the problems below. Work each problem independently and show how you solved it. Your teacher will discuss the answers with you when you have finished.

1. Carlos lives $1\frac{2}{3}$ miles from school, and Maria lives $\frac{3}{4}$ mile from school. How much farther from school does Carlos live than Maria?

2. Last week Lee worked 2 days at the grocery store. If he worked $2\frac{1}{2}$ hours on Monday and $4\frac{3}{4}$ hours on Friday, how many total hours did he work?

3. So far Jill has planted $\frac{1}{4}$ of her garden as flowers and $\frac{3}{8}$ as vegetables. How much of the garden does she still have to plant?

Directions: Solve the questions, showing all your work.

1. $$\begin{array}{r} 2\frac{3}{7} \\ +\ 5\frac{1}{5} \\ \hline \end{array}$$

2. $$\begin{array}{r} 3\frac{1}{3} \\ -\ \frac{7}{8} \\ \hline \end{array}$$

3. Miguel's car had $5\frac{1}{4}$ gallons of gas. He added another $4\frac{5}{6}$ gallons. How much gas is in the car now?

Lesson Objective: Multiply fractions, mixed numbers, and whole numbers.

Vocabulary Box

mixed number – A number with a whole number part and a fraction part. Examples: $3\frac{2}{3}$, $6\frac{2}{8}$.

cross cancellation – The process of simplifying two fractions by dividing the numerator of one fraction and the denominator of the opposite fraction by a common factor and then multiplying the fractions. Example: $\frac{6}{8}\times\frac{4}{3}=\frac{\cancel{6}^{2}}{\cancel{8}_{2}}\times\frac{\cancel{4}^{1}}{\cancel{3}_{1}}=\frac{2}{2}=1$.

Guided Practice

Directions: Complete the following practice problems. Your teacher will review the answers. Make sure you show all your work, and remember to write each answer in simplest form.

I. Work with a partner to solve each problem.

1. $\frac{1}{7}$ x $\frac{3}{5}$

2. $\frac{7}{8}$ x $\frac{7}{3}$

3. $\frac{3}{4}$x$\frac{1}{2}$

4. $\frac{1}{12}$x$\frac{5}{4}$

5. $\frac{1}{11} x \frac{2}{3}$

6. $\frac{1}{3} x \frac{2}{9}$

II. Work with a partner to write each mixed number as an improper fraction.

1. $14\frac{1}{2}$

2. $7\frac{1}{4}$

3. $6\frac{5}{12}$

III. Use cross cancellation to solve each problem. You may work with a partner.

1. $\frac{5}{3} \times \frac{15}{2}$

2. $\frac{7}{1} \times \frac{1}{14}$

3. $\frac{6}{15} \times \frac{5}{8}$

IV. Solve each problem, using cross cancellation. Please work independently.

1. $\frac{2}{3}$ x 6

2. $4\frac{1}{2}$ x $\frac{4}{5}$

3. $5\frac{1}{3} \times 2\frac{1}{4}$

Summary/Closure

A. Vocabulary Words

1. Write three examples of mixed numbers.

2. Explain how cross cancellation makes some multiplication problems easier to solve.

B. Summarize What We Learned Today

Write a sample multiplication problem that uses cross cancellation of fractions. Solve the problem, and use complete sentences to explain how to cross cancel fractions.

Next, write a sample multiplication problem that multiplies a whole number by a fraction. Solve the problem, and explain what you had to do to the whole number in order to complete the problem.

Finally, write a sample problem that multiplies a mixed number by a mixed number. Solve the problem, and explain what you had to do to the mixed numbers before you multiplied them.

lesson six - student resource sheet

Lesson Objective: Multiply fractions, mixed numbers, and whole numbers.

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cross cancellation – The process of simplifying two fractions by dividing the numerator of one fraction and the denominator of the opposite fraction by a common factor and then multiplying the fractions. Example: $\frac{6}{8}\times\frac{4}{3}=\frac{\cancel{6}^{2}}{\cancel{8}}\times\frac{\cancel{4}^{1}}{\cancel{3}}=\frac{2}{2}=1$.

Independent Practice

Directions: Solve each multiplication problem. Use cross cancellation when appropriate, and be sure to write each answer in simplest form.

1. $\frac{9}{10}\times\frac{3}{2}$

2. $\frac{15}{8}\times\frac{5}{4}$

3. $\frac{4}{7}\times\frac{8}{3}$

4. $\frac{1}{6}\times\frac{7}{5}$

5. $\frac{1}{9}\times\frac{27}{5}$

6. $\frac{3}{6} \times \frac{4}{9}$

7. $\frac{5}{8} \times \frac{3}{25}$

8. $\frac{7}{2} \times \frac{4}{21}$

9. $1\frac{6}{7} \times 2\frac{2}{3}$

10. $1\frac{1}{7} \times 2\frac{2}{3}$

BONUS?

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1. $5\frac{5}{8} \times 2\frac{6}{7} =$

2. $2\frac{1}{3} \times 3\frac{1}{4} =$

Directions: Solve these word problems, using good problem-solving strategies. Be sure to show all your work, and write each answer in simplest form, using a complete sentence.

1. Danielle ate $2\frac{1}{2}$ finger sandwiches during a party. Manuel ate 3 times as many sandwiches as Danielle. How many sandwiches did Manuel eat?

2. On Monday, the Nelsons drove $5\frac{1}{2}$ hours. On Tuesday, they drove $2\frac{1}{4}$ times as long. How many hours did they drive on Tuesday*?*

3. Patrick worked $10\frac{2}{3}$ hours at the car shop last week. This week, he worked $\frac{3}{4}$ as many hours. How many hours did Patrick work this week?

4. A baker made 50 dozen cookies. He sold $\frac{4}{5}$ of them in a day. How many dozen cookies did he sell?

Directions: Use what you know about multiplying fractions to answer each question.

1. $1\frac{1}{4} \times 2\frac{2}{5} =$ _____

2. $5 \times \frac{4}{7} =$ _____

3. Write $3\frac{3}{4}$ as an improper fraction. _____