

6th Grade Common Core Unit #3: Fractions

Resources: Big Ideas Chapter 2

Common Core Standards: 6.NS.1

Main Focus: Fluently add, subtract, multiply, and divide fractions and mixed numbers.

Number	Learning Targets	Common Core Standard	Resources
1	I can multiply fractions.	6.NS.1 (Background)	2.1
2	I can divide fractions and identify reciprocals of a number.	6.NS.1	2.2
3	I can divide mixed numbers to solve real world problems.	6.NS.1	2.3
4	I can understand when to multiply and when to divide fractions.	6.NS.1	2.4 Extra

My Practice:

Number	Pre-test:	Exit slip scores	Day #2 Homework	Extra Targeted Practice	Post-test:
1	_____/5				_____/
2	_____/4				_____/
3	_____/3				_____/
4	_____/3				_____/

My Final Pretest Score: _____ /15

My Final Pretest Percent _____ %

My Final Posttest Score: _____ /

My Final Posttest Percent: _____ %

My percent of increase between the Pre and Post test scores = _____ !!

2.1 Multiplying Fractions and Mixed Numbers Notes

Objective: Students will demonstrate an understanding of the process for multiplying fractional numbers.

Vocabulary:

Mixed Number- a _____ and a _____ combined into one "mixed" number

Improper Fraction- a fraction whose _____ is larger than the

- Steps:**
1. Write all numbers in fraction form.
 2. Cross-Simplify (Divide out common factors)
 3. Multiply Numerators
 4. Multiply Denominators
 5. Make sure the answer is in simplest form.

Examples:

1.) $\frac{8}{9} \times \frac{3}{4} =$	2.) $3 \times \frac{4}{15} =$
3.) $\frac{1}{2} \times 2\frac{3}{4} =$	4.) $5\frac{5}{7} \times 2\frac{1}{10} =$

5.) You have $\frac{2}{3}$ of a bag of flour. You use $\frac{3}{4}$ of the flour to make bread dough. How much of the entire bag do you use to make the dough?

2.1**Practice**
Homework Day One

Multiply. Write the answer in simplest form.

1. $\frac{1}{6} \times \frac{5}{8}$

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

3. $\frac{8}{9} \times \frac{3}{5}$

4. $\frac{7}{8} \times 2\frac{1}{3}$

5. $7 \times 3\frac{9}{14}$

6. $5\frac{5}{9} \times 2\frac{7}{10}$

7. You reserve $\frac{2}{5}$ of the seats on a tour bus. You are able to fill $\frac{5}{8}$ of the seats you reserve. What fraction of the seats on the bus are you able to fill?

8. A triangle has a base of $5\frac{2}{3}$ inches and a height of 3 inches. What is the area of the triangle? (remember Area = $\frac{1}{2}$ bh or one-half base times height)

2.1 Practice A DAY TWO HOMEWORK

Multiply. Write the answer in simplest form.

BOTH SIDES

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

2. $\frac{1}{3} \times \frac{4}{7}$

3. $\frac{7}{8} \times 12$

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

5. $6\frac{2}{3} \times 12$

6. $5\frac{1}{2} \times \frac{7}{11}$

7. Describe and correct the error in finding the product.

$$\times \quad 3\frac{7}{8} \times 6\frac{2}{5} = 18\frac{14}{40} = 18\frac{7}{20}$$

8. Two-fifths of the students in your class are in the band. Of these, one-fourth play the saxophone.

a. What fraction of your class plays the saxophone?

b. There are 30 students in your class. How many students in your class play the saxophone?

9. Five years ago, an alligator was $2\frac{1}{6}$ feet long. Today, the alligator is three times longer. How long is the alligator now?

10. A poster is $8\frac{1}{2}$ inches by 11 inches. You enlarge the poster by increasing each dimension by a factor of $2\frac{1}{2}$. What is the area of the new poster?

2.2 Dividing Fractions Student Notes

Objective: Students will apply the concept of reciprocals when dividing with fractional numbers.

Vocabulary:

- The **inverse** of an operation in math is its _____. It un-does the problem.
 - The inverse of division is _____.
- The **reciprocal** of a fraction is like an inverse. It's the fraction turned upside down or "_____".
 - When we multiply a fraction by its reciprocal, the product is _____.
 - $\frac{4}{7} \times \frac{7}{4} = \underline{\hspace{1cm}}$ which is _____ when simplified.

Dividing Proper Fractions:

$$1.) \frac{3}{5} \div \frac{1}{2} =$$

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

$$\frac{3}{5} \times \frac{2}{1} = \underline{\hspace{1cm}}$$

$$= \underline{\hspace{1cm}}$$

← 1.) Exchange the division sign for its **inverse** - _____

← 2.) Replace the _____ fraction with its **reciprocal**.

← 3.) _____ and re-write as a mixed number.

When we have *two opposites*, or _____ in the same problem, they cancel each other out. This is why multiplying by the reciprocal works for dividing fractions!

$$2.) \frac{7}{8} \div \frac{3}{4} = \underline{\hspace{1cm}}$$

Once you have re-written the math problem with multiplying by the reciprocal, we can _____ the numbers just like how we do when we multiply fractions.

$$3.) 9 \div \frac{2}{6} = \underline{\hspace{1cm}}$$

2.2**Practice**
Homework Day One

Write the reciprocal of the number.

1. $\frac{5}{8}$

2. 6

3. $\frac{1}{3}$

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

Evaluate the expression.

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

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

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

8.)

$\frac{10}{27} \div \frac{2}{3}$

9.)

$\frac{18}{25} \div \frac{8}{15}$

10.)

$\frac{7}{12} \div 14$

11. You have $\frac{3}{5}$ of an apple pie. You divide the remaining pie into 5 equal slices. What fraction of the original pie is each slice?

2.2

Practice A Homework Day Two

Complete the statement.

BOTH SIDES

1. $\frac{3}{8} \times \underline{\hspace{2cm}} = 1$

2. $7 \times \underline{\hspace{2cm}} = 1$

3. $3 \div \underline{\hspace{2cm}} = 36$

4. $\frac{4}{9} \div \frac{1}{27} = \underline{\hspace{2cm}}$

Divide. Write the answer in simplest form.

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

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

7. $\frac{3}{5} \div \frac{2}{15}$

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

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

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

11. Describe and correct the error in finding the quotient.

$\times \quad \frac{3}{4} \div 6 = \frac{3}{4} \div \frac{6}{1} = \frac{18}{4} = \frac{9}{2} = 4\frac{1}{2}$



Determine whether the numbers are reciprocals. If not, write the reciprocal of each number.

12. $\frac{5}{8}, \frac{16}{10}$

Reciprocals? YES NO

13. $\frac{1}{12}, 12$

Reciprocals? YES NO

14. $\frac{2}{3}, \frac{12}{18}$

Reciprocals? YES NO

15. $\frac{4}{7}, \frac{7}{8}$

Reciprocals? YES NO

16. You have $\frac{2}{3}$ of a pizza. You divide the remaining pizza into 4 equal pieces. What fraction of the pizza is each piece?

17. You have five quarts of paint. It takes $\frac{5}{8}$ quart to paint each chair you are asked to paint. How many chairs can you paint?

18. Is the reciprocal of a fraction always a whole number? Explain.

2.3 Dividing Mixed Numbers Student Notes

Objective: Students will apply a correct algorithm to divide mixed numbers.

- Steps:
- 1.) Write all numbers in fraction form.
 - 2.) Rewrite the problem-multiply by the reciprocal.
("Keep, Change, Flip")
 - 3.) Cross-simplify if you can
 - 4.) Multiply numerators.
 - 5.) Multiply denominators.
 - 6.) Simplify answer, if needed.

Be sure to always convert any mixed numbers into _____ fractions to complete the problem!

1.) $9\frac{1}{3} \div \frac{2}{6} = \underline{\hspace{2cm}}$

2.) $6\frac{2}{3} \div 2\frac{2}{5} = \underline{\hspace{2cm}}$

- 3.) Mr. Diveley purchased a piece of wood at Home Depot that is $12\frac{3}{4}$ feet long. If he is building a table that needs segments of wood that are $\frac{3}{4}$ feet long, how many segments will he be able to cut from his original piece of lumber?

2.3**Practice**
Homework Day One

Divide. Write the answer in simplest form.

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

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

3. $8\frac{1}{6} \div 2\frac{1}{24}$

4. $2\frac{3}{10} \div 3\frac{3}{5}$

5. $6\frac{6}{7} \div 3\frac{3}{5}$

6. $3\frac{3}{5} \div 6\frac{6}{7}$

7. At a road race, you have $60\frac{3}{4}$ feet available for a water station. Your tables are $6\frac{3}{4}$ feet long. How many tables can you line up for the water station?

2.3 Practice A Day Two Homework

Divide. Write the answer in simplest form.

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

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

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

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

5. $9\frac{4}{5} \div 7$

6. $3\frac{5}{9} \div 16$

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

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

9. $6\frac{2}{9} \div 6\frac{2}{3}$

10. Describe and correct the error in finding the quotient.

$$\times \quad 8 \div 2\frac{3}{4} = \frac{1}{8} \div \frac{11}{4} = \frac{1}{8} \times \frac{4}{11} = \frac{1}{22}$$

2.4 Multiplying and Dividing Fractions Word Problems STUDENT NOTES

Essential Questions: How can you identify the math operation needed for working with fractions in a word problem? How can you make sense of the math problem?

Lesson Objective: Students will work together to determine key math operations in fraction word problems and use rules for multiplying and dividing fractions to solve these problems.

Steps:

1. _____ the problem and underline words that can be math operations.
2. Draw a _____ if that is a useful strategy.
3. Decide if you are breaking apart or putting together for the final product or quotient. This helps determine if you are _____ or multiplying.

Examples:

1. How many $\frac{3}{4}$ pound packages can you make with 6 pounds of sunflower seeds?

Circle one: **MULTIPLY** or **DIVIDE**

Now Solve:

2. Maddie makes $3\frac{1}{2}$ cups of homemade applesauce. If she splits the homemade applesauce into $\frac{1}{8}$ cups per serving, how many servings can she get from the applesauce?

Circle one: **MULTIPLY** or **DIVIDE**

Now Solve:

2.4**2.4**
Homework Day One

- 1.) Trish has a mini swimming pool for her dog. It can hold $8\frac{2}{3}$ gallons of water. If she fills it $\frac{3}{4}$ of the way full, how many gallons of water are in the swimming pool?

Circle one: **MULTIPLY** or **DIVIDE**

Solve:

- 2.) There are 15 people in a room. Each person ate $\frac{2}{3}$ of a pizza. There was no pizza remaining. How many pizzas were in the room?

Circle one: **MULTIPLY** or **DIVIDE**

Solve:

- 3.) The recipe for chocolate chip cookies calls for $2\frac{3}{4}$ cups of flour. You want to triple the recipe. How much flour will you need?

Circle one: **MULTIPLY** or **DIVIDE**

Solve:

- 4.) Sam made trail mix to pass out to his family. He made $10\frac{1}{2}$ cups of trail mix. If he splits it between the 6 people in his family, how much does each person get?

Circle one: **MULTIPLY** or **DIVIDE**

Solve:

2.4 Day 2 Homework

Practice Homework Day Two

BOTH SIDES

- 1.) Andrew bought 224 games. He bought $\frac{3}{4}$ of his games on the Internet. How many games did he buy on the Internet?

Circle one: MULTIPLY or DIVIDE

Now Solve:

- 2.) Your book has a total of 108 pages. You read $\frac{2}{9}$ of the book over the weekend. How many pages did you read?

Circle one: MULTIPLY or DIVIDE

Now Solve:

- 3.) Your teacher rents a movie that is $4\frac{1}{2}$ hours long. Your class periods are only $\frac{3}{4}$ of an hour long. How many class periods will it take to watch the movie.

Circle one: MULTIPLY or DIVIDE

Now Solve:

- 4.) A car is traveling $40\frac{1}{2}$ miles in $\frac{3}{5}$ of an hour. On average, how far do you travel in one hour?

Circle one: MULTIPLY or DIVIDE

Now Solve:

Section 4 Extra - Practice Homework Day 2 (cont.)

- 5.) Marcus had \$450 to spend. He spent $\frac{2}{5}$ of it on a DVD player. How much money did he spend?

Circle one: MULTIPLY or DIVIDE

Now Solve:

- 6.) You order 6 pizzas for a party. If each person can eat $\frac{1}{3}$ of a pizza, how many people can attend the party?

Circle one: MULTIPLY or DIVIDE

Now Solve:

- 7.) $\frac{2}{9}$ of the people at a restaurant are adults. If there are 117 people at the restaurant, how many are children?

Circle one: MULTIPLY or DIVIDE

Now Solve: