

**North Penn School District**  
**Elementary Math Parent Letter**

**Grade 4**

**Unit 4 – Chapter 8: Multiply Fractions by Whole Numbers**

**Examples for each lesson:**

**Lesson 8.1**

**Multiples of Unit Fractions**

A unit fraction is a fraction with a numerator of 1. You can write a fraction as the product of a whole number and a unit fraction.

**Write  $\frac{7}{10}$  as the product of a whole number and a unit fraction.**

Write  $\frac{7}{10}$  as the sum of unit fractions.

$$\frac{7}{10} = \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10}$$

Use multiplication to show repeated addition.

$$\frac{7}{10} = 7 \times \frac{1}{10}$$

So,  $\frac{7}{10} = 7 \times \frac{1}{10}$ .

The product of a number and a counting number is a multiple of the number. You can find multiples of unit fractions.

**List the next 4 multiples of  $\frac{1}{8}$ .**

Make a table and use repeated addition.

$1 \times \frac{1}{8}$	$2 \times \frac{1}{8}$	$3 \times \frac{1}{8}$	$4 \times \frac{1}{8}$	$5 \times \frac{1}{8}$
$\frac{1}{8}$	$\frac{1}{8} + \frac{1}{8}$	$\frac{1}{8} + \frac{1}{8} + \frac{1}{8}$	$\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$	$\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$
$\frac{1}{8}$	$\frac{2}{8}$	$\frac{3}{8}$	$\frac{4}{8}$	$\frac{5}{8}$

The next 4 multiples of  $\frac{1}{8}$  are  $\frac{2}{8}$ ,  $\frac{3}{8}$ ,  $\frac{4}{8}$ , and  $\frac{5}{8}$ .

## Lesson 8.2

### Multiples of Fractions

You have learned to write multiples of unit fractions. You can also write multiples of other fractions.

Write the next 4 multiples of  $\frac{2}{5}$ .

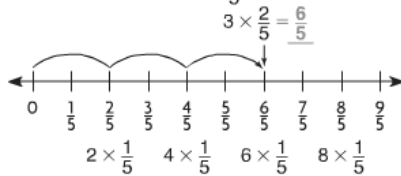
Make a table.

$1 \times \frac{2}{5}$	$2 \times \frac{2}{5}$	$3 \times \frac{2}{5}$	$4 \times \frac{2}{5}$	$5 \times \frac{2}{5}$
$\frac{2}{5}$	$\frac{2}{5} + \frac{2}{5}$	$\frac{2}{5} + \frac{2}{5} + \frac{2}{5}$	$\frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5}$	$\frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5}$
$\frac{2}{5}$	$\frac{4}{5}$	$\frac{6}{5}$	$\frac{8}{5}$	$\frac{10}{5}$

So, the next 4 multiples of  $\frac{2}{5}$  are  $\frac{4}{5}$ ,  $\frac{6}{5}$ ,  $\frac{8}{5}$ , and  $\frac{10}{5}$ .

Write  $3 \times \frac{2}{5}$  as the product of a whole number and a unit fraction.

Use a number line. Make three jumps of  $\frac{2}{5}$ .



So,  $3 \times \frac{2}{5} = \frac{6}{5}$ , or  $6 \times \frac{1}{5}$ .

## Lesson 8.3

### Multiply a Fraction by a Whole Number Using Models

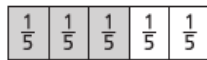
You can use a model to multiply a fraction by a whole number.

Find the product of  $4 \times \frac{3}{5}$ .

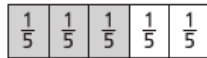
Use fraction strips. Show 4 groups of  $\frac{3}{5}$  each.



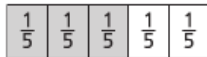
1 group of  $\frac{3}{5} = \frac{3}{5}$



2 groups of  $\frac{3}{5} = \frac{6}{5}$



3 groups of  $\frac{3}{5} = \frac{9}{5}$



4 groups of  $\frac{3}{5} = \frac{12}{5}$

So,  $4 \times \frac{3}{5} = \frac{12}{5}$ .

More information on this strategy is available on Animated Math Model #33.

## Lesson 8.4

### Multiply a Fraction or Mixed Number by a Whole Number

To multiply a fraction by a whole number, multiply the numerators.  
Then multiply the denominators.

**A recipe for one loaf of bread calls for  $2\frac{1}{4}$  cups of flour. How many cups of flour will you need for 2 loaves of bread?**

**Step 1** Write and solve an equation.

$$\begin{aligned} 2 \times 2\frac{1}{4} &= \frac{2}{1} \times \frac{9}{4} && \text{Write 2 as } \frac{2}{1}. \text{ Write } 2\frac{1}{4} \text{ as a fraction.} \\ &= \frac{2 \times 9}{1 \times 4} && \text{Multiply the numerators.} \\ &= \frac{18}{4} && \text{Then multiply the denominators.} \\ &= \frac{18}{4} && \text{Simplify.} \end{aligned}$$

**Step 2** Write the product as a mixed number.

$$\begin{aligned} \frac{18}{4} &= \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} \\ &= \underbrace{\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}}_1 + \underbrace{\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}}_1 + \underbrace{\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}}_1 + \underbrace{\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}}_1 + \frac{1}{4} + \frac{1}{4} \\ &= \frac{4}{4} + \frac{1}{4} + \frac{1}{4} && \text{Combine the wholes. Then combine the remaining parts.} \\ &= \frac{4^2}{4}, \text{ or } \frac{4^1}{2} && \text{Add. Write the sum as a mixed number.} \end{aligned}$$

So, you will need  $4\frac{1}{2}$  cups of flour.

More information on this strategy is available on Animated Math Models #30, 33.

## Lesson 8.5

### Problem Solving • Comparison Problems with Fractions

The Great Salt Lake in Utah is about  $\frac{4}{5}$  mile above sea level. Lake Titicaca in South America is about 3 times as high above sea level as the Great Salt Lake. About how high above sea level is Lake Titicaca?

Read the Problem	Solve the Problem
<p><b>What do I need to find?</b></p> <p>I need to find <u>about how high above sea level Lake Titicaca is.</u></p>	<p>Draw a comparison model. Compare the heights above sea level of the Great Salt Lake and Lake Titicaca, in miles.</p> <p><u>Great Salt Lake</u> <math>\frac{4}{5}</math></p>
<p><b>What information do I need to use?</b></p> <p>The Great Salt Lake is about <math>\frac{4}{5}</math> mile above sea level. Lake Titicaca is about <u>3</u> times as high above sea level.</p>	<p><u>Lake Titicaca</u> <math>\frac{4}{5}</math> <math>\frac{4}{5}</math> <math>\frac{4}{5}</math></p> <p style="text-align: center;">t</p> <p>Write an equation and solve.</p> <p>t is the height above sea level of <u>Lake Titicaca</u>, in miles.</p>
<p><b>How will I use the information?</b></p> <p>I can <u>draw a diagram</u> to compare the heights.</p>	<p><math>t = \frac{3}{1} \times \frac{4}{5}</math> Write an equation.</p> <p><math>t = \frac{12}{5}</math> Multiply.</p> <p><math>t = 2\frac{2}{5}</math> Write the fraction as a mixed number.</p>
<p>So, Lake Titicaca is about <math>2\frac{2}{5}</math> miles above sea level.</p>	

More information on this strategy is available on Animated Math Models #30, 33.

#### Vocabulary

**Factor** – a number that is multiplied by another number to find a product

**Fraction** – a number that names part of a whole or part of a group

**Identity Property of Multiplication** – the property that states the product of any number and 1 is that number

**Multiple** – the product of two counting numbers

**Product** – the answer to a multiplication problem

**Unit fraction** – a fraction that has a numerator of one