

Name \_\_\_\_\_

## 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.

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

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

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.

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

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

**Write the fraction as the product of a whole number and a unit fraction.**

1.  $\frac{2}{5} =$  \_\_\_\_\_

2.  $\frac{5}{12} =$  \_\_\_\_\_

3.  $\frac{7}{2} =$  \_\_\_\_\_

**List the next four multiples of the unit fraction.**

4.  $\frac{1}{4}$ , \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

5.  $\frac{1}{6}$ , \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Name \_\_\_\_\_

## Mixed Numbers and Unit Fractions

Write each mixed number as the product of a whole number and a unit fraction.

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

\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

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


\_\_\_\_\_

7.  $4\frac{2}{5}$

\_\_\_\_\_

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

\_\_\_\_\_

9.  **Write Math** Explain how you found the answer in Exercise 1.

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Name \_\_\_\_\_

## 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  $\frac{2}{5}$ .

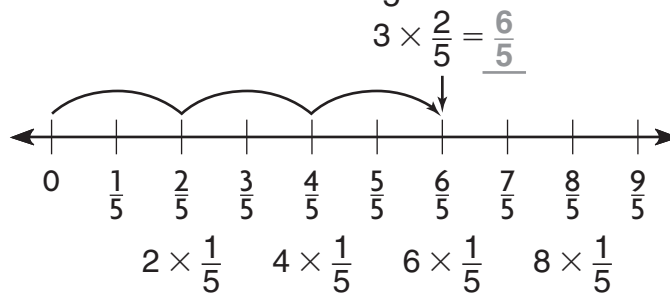
Make a table.

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

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  $\frac{2}{5}$ .



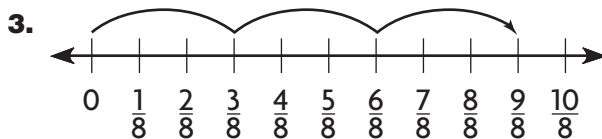
So,  $3 \times \frac{2}{5} = \frac{6}{5}$ , or  $6 \times \frac{1}{5}$ .

List the next four multiples of the fraction.

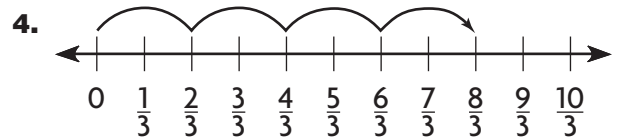
1.  $\frac{3}{4}$ , \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

2.  $\frac{5}{6}$ , \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Write as the product of a whole number and a unit fraction.



$3 \times \frac{3}{8} =$  \_\_\_\_\_



$4 \times \frac{2}{3} =$  \_\_\_\_\_

Name \_\_\_\_\_

## Multiples of Mixed Numbers

List the next three multiples of the mixed number. Write each multiple as a mixed number or as a whole number.

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

\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

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


\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

9.  **Write Math** Describe a method other than multiplication that you can use to find the next three multiples of the mixed number in Exercise 7.

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Name \_\_\_\_\_

## 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  $\frac{3}{5} = \frac{6}{5}$



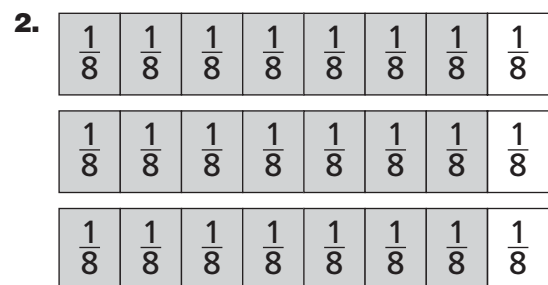
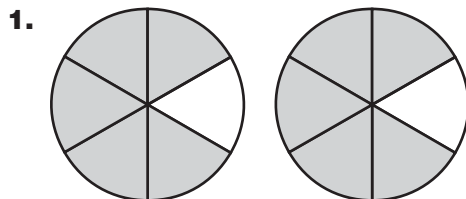
3 groups of  $\frac{3}{5} = \frac{9}{5}$



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

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

### Multiply.



$2 \times \frac{5}{6} = \underline{\hspace{2cm}}$

$3 \times \frac{7}{8} = \underline{\hspace{2cm}}$

3.  $6 \times \frac{2}{3} = \underline{\hspace{2cm}}$

4.  $2 \times \frac{9}{10} = \underline{\hspace{2cm}}$

5.  $5 \times \frac{3}{4} = \underline{\hspace{2cm}}$

6.  $4 \times \frac{5}{8} = \underline{\hspace{2cm}}$

7.  $7 \times \frac{2}{5} = \underline{\hspace{2cm}}$

8.  $8 \times \frac{4}{6} = \underline{\hspace{2cm}}$

Name \_\_\_\_\_

## Fraction of a Whole Number

Find the product. Write the product as a whole number.

1.  $\frac{1}{8} \times 24 =$

\_\_\_\_\_

2.  $\frac{2}{3} \times 15 =$

\_\_\_\_\_

3.  $\frac{3}{5} \times 10 =$

\_\_\_\_\_

4.  $\frac{4}{7} \times 14 =$

\_\_\_\_\_

5.  $\frac{5}{6} \times 18 =$

\_\_\_\_\_

6.  $\frac{3}{4} \times 16 =$

\_\_\_\_\_

7.  $\frac{2}{9} \times 27 =$

\_\_\_\_\_

8.  $\frac{7}{8} \times 32 =$

\_\_\_\_\_

9.  $\frac{9}{10} \times 50 =$

\_\_\_\_\_

10.  $\frac{4}{5} \times 45 =$

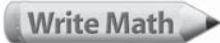
\_\_\_\_\_

11.  $\frac{5}{12} \times 60 =$

\_\_\_\_\_

12.  $\frac{8}{9} \times 54 =$

\_\_\_\_\_

13.  Write Math Explain how you can tell if the product of a fraction and a whole number will be a whole number.

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Name \_\_\_\_\_

## 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.

$$2 \times 2\frac{1}{4} = \frac{2}{1} \times \frac{9}{4} \quad \text{Write 2 as } \frac{2}{1}. \text{ Write } 2\frac{1}{4} \text{ as a fraction.}$$

$$= \frac{2 \times 9}{1 \times 4} \quad \text{Multiply the numerators. Then multiply the denominators.}$$

$$= \frac{18}{4} \quad \text{Simplify.}$$

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

$$\frac{18}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$$

$$= \underbrace{\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}}_1 + \underbrace{\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}}_1 + \underbrace{\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}}_1 + \underbrace{\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}}_1 + \frac{1}{4} + \frac{1}{4}$$

$$= \frac{4}{4} + \frac{1}{4} + \frac{1}{4} \quad \text{Combine the wholes. Then combine the remaining parts.}$$

$$= \frac{4\cancel{2}}{\cancel{4}} \text{, or } 4\frac{1}{2} \quad \text{Add. Write the sum as a mixed number.}$$

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

**Multiply. Write the product as a mixed number.**

1.  $3 \times \frac{2}{5} =$  \_\_\_\_\_

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

3.  $5 \times \frac{1}{3} =$  \_\_\_\_\_

4.  $2 \times 1\frac{3}{10} =$  \_\_\_\_\_

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

6.  $7 \times 1\frac{1}{6} =$  \_\_\_\_\_

Name \_\_\_\_\_

## Unknown Numbers

Find the unknown number that makes each equation true.

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

\_\_\_\_\_

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

\_\_\_\_\_

3.  $7 \times \blacksquare = 1\frac{5}{9}$

\_\_\_\_\_

4.  $2 \times \blacksquare \frac{1}{3} = 6\frac{2}{3}$


\_\_\_\_\_

5.  $\blacksquare \times 1\frac{5}{6} = 9\frac{1}{6}$

\_\_\_\_\_

6.  $\blacksquare \times 2\frac{2}{7} = 13\frac{5}{7}$

\_\_\_\_\_

7.  **Write Math** Explain how you found the unknown number in Exercise 3.

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Name \_\_\_\_\_

## 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> <span style="border: 1px solid black; padding: 2px;"><math>\frac{4}{5}</math></span></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> <span style="display: inline-block; border: 1px solid black; padding: 2px;"><math>\frac{4}{5}</math></span> <span style="display: inline-block; border: 1px solid black; padding: 2px;"><math>\frac{4}{5}</math></span> <span style="display: inline-block; border: 1px solid black; padding: 2px;"><math>\frac{4}{5}</math></span></p> <p style="text-align: center;">} <math>t</math></p> <p>Write an equation and solve.</p> <p><math>t</math> 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>	

1. Amelia is training for a triathlon. She swims  $\frac{3}{5}$  mile. Then she runs about 6 times farther than she swims. About how far does Amelia run?

2. Last week, Meg bought  $1\frac{3}{4}$  pounds of fruit at the market. This week, she buys 4 times as many pounds of fruit as last week. In pounds, how much fruit does Meg buy this week?

Name \_\_\_\_\_

## Heights and Depths

Solve each problem. You may find it helpful to draw a diagram.

- The depth of Lake Carl is about  $1\frac{1}{8}$  miles. Lake Susan is 3 times as deep as Lake Carl. Lake Wayne is 2 times as deep as Lake Susan. How much deeper is Lake Wayne than Lake Susan?

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- Mount Rogers rises  $\frac{1}{4}$  mile above sea level. Mount Taylor rises 6 times as high as Mount Rogers. Mount Sullivan rises 2 times as high as Mount Rogers. What is the difference in the elevation of Mount Taylor and the elevation of Mount Sullivan?

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- A certain tree was  $5\frac{1}{3}$  feet tall when it was first planted. A few years later, the tree is 4 times as tall as it was when it was first planted. How much has the tree grown since it was first planted?

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-  **Explain** how you solved Problem 3.

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