

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.

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

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 $\frac{5}{8}$.

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. $\frac{1}{6}$, _____, _____, _____, _____

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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 $\frac{2}{5}$.

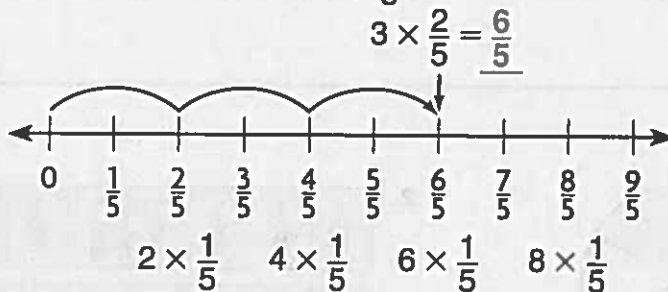
Make a table.

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

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 $\frac{2}{5}$.



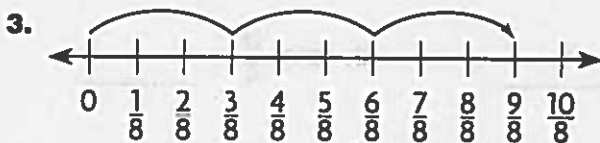
So, $3 \times \frac{2}{5} = \frac{6}{5}$, or $6 \times \frac{1}{5}$.

List the next four multiples of the fraction.

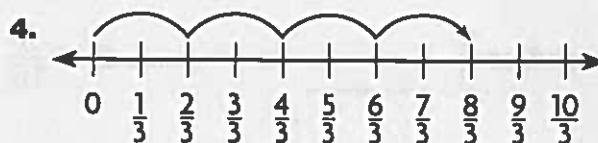
1. $\frac{3}{4}$, _____, _____, _____, _____

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

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



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



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

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

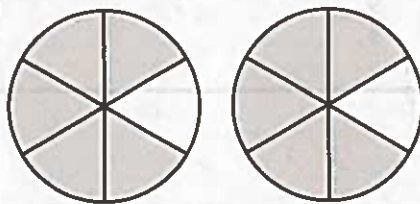


4 groups of $\frac{3}{5} = \frac{12}{5}$

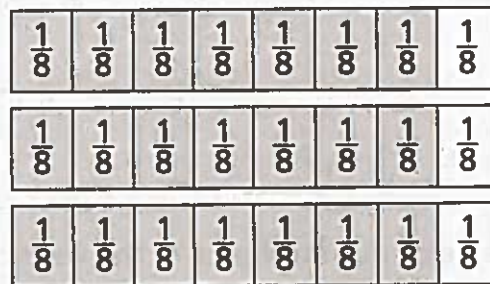
So, $4 \times \frac{3}{5} = \frac{12}{5}$.

Multiply.

1.



2.



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

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

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

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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.

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

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

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

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

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

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