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.

\[
\frac{7}{10} = \frac{7}{10} \times \frac{1}{10}
\]

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

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.

<table>
<thead>
<tr>
<th>(1 \times \frac{1}{8})</th>
<th>(2 \times \frac{1}{8})</th>
<th>(3 \times \frac{1}{8})</th>
<th>(4 \times \frac{1}{8})</th>
<th>(5 \times \frac{1}{8})</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\frac{1}{8})</td>
<td>(\frac{2}{8})</td>
<td>(\frac{3}{8})</td>
<td>(\frac{4}{8})</td>
<td>(\frac{5}{8})</td>
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<tr>
<td>(\frac{1}{8})</td>
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<tr>
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<td>(\frac{3}{8})</td>
<td>(\frac{4}{8})</td>
<td>(\frac{5}{8})</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>$1 \times \frac{2}{5}$</th>
<th>$2 \times \frac{2}{5}$</th>
<th>$3 \times \frac{2}{5}$</th>
<th>$4 \times \frac{2}{5}$</th>
<th>$5 \times \frac{2}{5}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{2}{5}$</td>
<td>$\frac{4}{5}$</td>
<td>$\frac{6}{5}$</td>
<td>$\frac{8}{5}$</td>
<td>$\frac{10}{5}$</td>
</tr>
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<td>$\frac{2}{5}$</td>
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<td>$\frac{6}{5}$</td>
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<td>$\frac{6}{5}$</td>
<td>$\frac{8}{5}$</td>
<td>$\frac{10}{5}$</td>
</tr>
</tbody>
</table>

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.

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 \( \frac{2}{3} \) cups of flour. How many cups of flour will you need for 2 loaves of bread?

Step 1 Write and solve an equation.

\[
2 \times 2 \frac{1}{4} = \frac{2}{1} \times \frac{9}{4}
\]

Write 2 as \( \frac{2}{1} \). Write \( 2 \frac{1}{4} \) as a fraction.

\[
= \frac{2 \times 9}{1 \times 4}
\]

Multiply the numerators. Then multiply the denominators.

\[
= \frac{18}{4}
\]

Simplify.

Step 2 Write the product as a mixed number.

\[
\frac{18}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}
\]

\[
= \frac{4}{4} + \frac{4}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}
\]

Combine the wholes. Then combine the remaining parts.

\[
= \frac{4}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}
\]

Add. Write the sum as a mixed number.

So, you will need ___ 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?

<table>
<thead>
<tr>
<th>Read the Problem</th>
<th>Solve the Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>What do I need to find?</td>
<td>Draw a comparison model. Compare the heights above sea level of the Great Salt Lake and Lake Titicaca, in miles.</td>
</tr>
<tr>
<td>I need to find about how high above sea level Lake Titicaca is.</td>
<td>Great Salt Lake</td>
</tr>
<tr>
<td>What information do I need to use?</td>
<td></td>
</tr>
<tr>
<td>The Great Salt Lake is about ( \frac{4}{5} ) mile above sea level. Lake Titicaca is about ( \frac{3}{5} ) times as high above sea level.</td>
<td></td>
</tr>
<tr>
<td>How will I use the information?</td>
<td></td>
</tr>
<tr>
<td>I can draw a diagram to compare the heights.</td>
<td></td>
</tr>
</tbody>
</table>

So, Lake Titicaca is about \( \frac{22}{5} \) miles above sea level.

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