

North Penn School District
Elementary Math Parent Letter

Grade 5

Unit 2 – Chapter 4: Multiply Decimals

Examples for each lesson:

Lesson 4.1

**Algebra • Multiplication Patterns
with Decimals**

You can use patterns and place value to help you place the decimal point.

To multiply a number by a power of 10, you can use the exponent to determine how the position of the decimal point changes in the product.

	Exponent	Move decimal point:
$10^0 \times 5.18 = \underline{5.18}$	0	0 places to the right
$10^1 \times 5.18 = \underline{51.8}$	1	1 place to the right
$10^2 \times 5.18 = \underline{518}$	2	2 places to the right
$10^3 \times 5.18 = \underline{5,180}$	3	3 places to the right

You can use place-value patterns to find the product of a number and the decimals 0.1 and 0.01.

	Multiply by:	Move decimal point:
$1 \times 2,457 = \underline{2,457}$	1	0 places to the left
$0.1 \times 2,457 = \underline{245.7}$	0.1	1 place to the left
$0.01 \times 2,457 = \underline{24.57}$	0.01	2 places to the left

Lesson 4.2

Multiply Decimals and Whole Numbers

You can draw a quick picture to help multiply a decimal and a whole number.

Find the product. 4×0.23

Draw a quick picture. Each bar represents one tenth, or 0.1. Each circle represents one hundredth, or 0.01.

Step 1

Draw 4 groups of 2 tenths and 3 hundredths.



So, $4 \times 0.23 = \underline{0.92}$.

Step 2

Combine the tenths. Then combine the hundredths.



Step 3

There are 12 hundredths. Rename 10 hundredths as 1 tenth. Then you will have 9 tenths and 2 hundredths.



Lesson 4.3

Multiplication with Decimals and Whole Numbers

To find the product of a one-digit whole number and a decimal, multiply as you would multiply whole numbers. To find the number of decimal places in the product, add the number of decimal places in the factors.

To multiply 6×4.25 , multiply as you would multiply 6×425 .

Step 1

Multiply the ones.

$$\begin{array}{r} 3 \\ 425 \\ \times 6 \\ \hline 0 \end{array}$$

So, $6 \times 4.25 = \underline{25.50}$.

Step 2

Multiply the tens.

$$\begin{array}{r} 13 \\ 425 \\ \times 6 \\ \hline 50 \end{array}$$

Step 3

Multiply the hundreds. Then place the decimal point in the product.

$$\begin{array}{r} 13 \\ 4.25 \leftarrow 2 \text{ decimal places} \\ \times 6 \leftarrow + 0 \text{ decimal places} \\ \hline 25.50 \leftarrow 2 \text{ decimal places} \end{array}$$

Lesson 4.4

Multiply Using Expanded Form

You can use a model and partial products to help you find the product of a two-digit whole number and a decimal.

Find the product. 13×6.8

Step 1 Draw a large rectangle. Label its longer side 13 and its shorter side 6.8. The area of the large rectangle represents the product, 13 \times 6.8.

Step 2 Rewrite the factors in expanded form. Divide the large rectangle into four smaller rectangles. Use the expanded forms to label the smaller rectangles.

$$13 = \underline{10} + \underline{3} \quad 6.8 = \underline{6} + \underline{0.8}$$

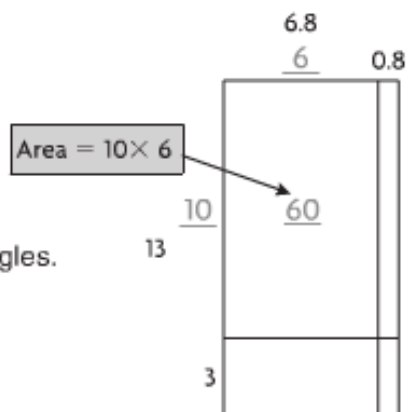
Step 3 Multiply to find the area of each small rectangle.

$$10 \times 6 = \underline{60} \quad 10 \times 0.8 = \underline{8} \quad 3 \times 6 = \underline{18} \quad 3 \times 0.8 = \underline{2.4}$$

Step 4 Add to find the total area.

$$\underline{60} + \underline{8} + \underline{18} + \underline{2.4} = \underline{88.4}$$

So, $13 \times 6.8 = \underline{88.4}$.



Lesson 4.5

Problem Solving • Multiply Money

Three students in the garden club enter a pumpkin-growing contest. Jessie's pumpkin is worth \$12.75. Mara's pumpkin is worth 4 times as much as Jessie's. Hayden's pumpkin is worth \$22.25 more than Mara's. How much is Hayden's pumpkin worth?

Read the Problem	Solve the Problem										
<p>What do I need to find?</p> <p>I need to find <u>how much Hayden's pumpkin is worth</u>.</p>	<p>The amount that Hayden's and Mara's pumpkins are worth depends on how much Jessie's pumpkin is worth. Draw a diagram to compare the amounts without calculating. Then use the diagram to find how much each person's pumpkin is worth.</p> <p>Jessie: <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>\$12.75</td></tr></table></p> <p>Mara: <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>\$12.75</td><td>\$12.75</td><td>\$12.75</td><td>\$12.75</td></tr></table></p> <p>Hayden: <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>\$12.75</td><td>\$12.75</td><td>\$12.75</td><td>\$12.75</td><td>\$22.25</td></tr></table></p> <p>Jessie: \$12.75 Mara: $4 \times \\$12.75 = \\51.00 Hayden: $\\$51.00 + \\$22.25 = \\$73.25$</p>	\$12.75	\$12.75	\$12.75	\$12.75	\$12.75	\$12.75	\$12.75	\$12.75	\$12.75	\$22.25
\$12.75											
\$12.75		\$12.75	\$12.75	\$12.75							
\$12.75	\$12.75	\$12.75	\$12.75	\$22.25							
<p>What information do I need to use?</p> <p>I need to use the worth of <u>Jessie's</u> pumpkin to find how much <u>Mara's</u> and <u>Hayden's</u> pumpkins are worth.</p>											
<p>How will I use the information:</p> <p>I can draw a diagram to show <u>how much Jessie's and Mara's pumpkins are worth to find how much Hayden's pumpkin is worth.</u></p>											
<p>So Hayden's pumpkin is worth <u>\$73.25</u>.</p>											

Lesson 4.6

Decimal Multiplication

You can use decimal squares to multiply decimals.

Multiply. 0.2×0.9

Step 1 Draw a square with 10 equal rows and 10 equal columns.

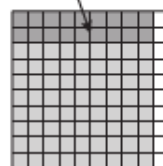
Step 2 Shade 9 columns to represent 0.9.

Step 3 Shade 2 rows to represent 0.2.

Step 4 Count the number of small squares where the shadings overlap: 18 squares, or 0.18.

So, $0.2 \times 0.9 = \underline{0.18}$.

The shadings overlap in 18 squares, or 0.18.



} 2 rows represent 0.2.

9 columns represent 0.9.

Lesson 4.7

Multiply Decimals

Multiply. 9.3×5.27

Step 1 Multiply as with whole numbers.

$$\begin{array}{r} 2\ 6 \\ 2 \\ \hline 527 \\ \times 93 \\ \hline 1,581 \\ + 47,430 \\ \hline 49,011 \end{array}$$

Step 2 Add the number of decimal places in the factors to place the decimal point in the product.

$$\begin{array}{r} 5.27 \leftarrow \underline{2} \text{ decimal places} \\ \times 9.3 \leftarrow + \underline{1} \text{ decimal place} \\ \hline 1,581 \\ + 47,430 \\ \hline 49.011 \leftarrow \underline{3} \text{ decimal places} \end{array}$$

So, $9.3 \times 5.27 = \underline{49.011}$.

More information on this strategy is available on Animated Math Model #19.

Lesson 4.8

Zeros in the Product

Sometimes when you multiply two decimals, there are not enough digits in the product to place the decimal point.

Multiply. 0.9×0.03

Step 1 Multiply as with whole numbers.

$$\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$$

Step 2 Find the number of decimal places in the product by adding the number of decimal places in the factors.

$$\begin{array}{r} 0.03 \leftarrow \underline{2} \text{ decimal places} \\ \times 0.9 \leftarrow + \underline{1} \text{ decimal place} \\ \hline \leftarrow \underline{3} \text{ decimal places} \end{array}$$

Step 3 Place the decimal point.

$$\begin{array}{r} 0.027 \\ \leftarrow \leftarrow \leftarrow \end{array}$$

There are not enough digits in the product to place the decimal point. Write zeros as needed to the left of the product to place the decimal point.

So, $0.9 \times 0.03 = \underline{0.027}$.

More information on this strategy is available on Animated Math Model #19.

Vocabulary

Decimal – a number with one or more digits to the right of the decimal point

Expanded form – a way to write a number that shows the value of each digit

Hundredths – one of one hundred equal parts

Multiplication – the process used to find the total number of items in a given number of groups

Ones – the value of a digit in the ones position on a place-value chart

Pattern – a repeating sequence that follows a rule that repeats

Place value – the value of a digit in a number based on the location of the digit

Product – the result when you multiply two numbers

Tenths – one of ten equal parts

Thousandths – one of one thousand equal parts