

Name _____ Class _____ Date _____

Multiplying Decimals: The Power of 10

Quick Tip: To multiply a decimal by a power of 10, move the decimal point to the left or right based on the number of zeroes in the power of 10.

- $2.388 \times 0.01 = 0.02388$ (move decimal left two places because there are 2 zeroes to the left of 1)
 $2.388 \times 0.1 = 0.2388$ (move decimal left one place because there is 1 zero to the left of 1)
 $2.388 \times 10 = 23.88$ (move decimal right one place because there is 1 zero to the right of 1)
 $2.388 \times 100 = 238.8$ (move decimal right two places because there are 2 zeros to the right of 1)
 $2.388 \times 1,000 = 2388$ (move decimal right three places because there are 3 zeroes to the right of 1)

Find the products.

87.91×10	459.27×0.1	13.5×0.01	$9.5 \times 1,000$
$0.0384 \times 1,000$	2345.291×100	0.2×10	$46.399 \times 10,000$

Dividing Decimals: The Power of 10

Quick Tip: To divide a decimal by a power of 10, move the decimal point to the left or right based on the number of zeroes in the power of 10.

- $456.7 \div 0.01 = 45670$ (move decimal right two places because there are 2 zeroes to the right of 1)
 $456.7 \div 0.1 = 4567$ (move decimal right one place because there is 1 zero to the right of 1)
 $456.7 \div 10 = 45.67$ (move decimal left one place because there is 1 zero to the left of 1)
 $456.7 \div 100 = 4.567$ (move decimal left two places because there are 2 zeros to the left of 1)
 $456.7 \div 1000 = 0.4567$ (move decimal left three places because there are 3 zeroes to the left of 1)

Find the quotients.

$578.1 \div 10$	$12.92 \div 0.1$	$3.7 \div 1000$	$9.0064 \div 0.01$
$0.873 \div 100$	$0.6 \div 10$	$0.42 \div 0.01$	$0.1 \div 0.1$

What is the Difference Between Multiplying Decimals & Multiplying Whole Numbers?

Answer:

<p><u>Set up as if multiplying whole numbers</u> You do not have to line up the decimal points. Stack according to the number of digits.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> $\begin{array}{r} 0.761 \\ \times 2.5 \\ \hline \end{array}$ <p>Even though 0.761 has a smaller value, it has more digits than 2.5. That is why it is positioned on top.</p> </div>	<p><u>Use algorithm for multiplying decimals</u> Don't use the decimal points during this step!</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> $\begin{array}{r} 0.761 \\ \times 2.5 \\ \hline 3805 \\ + 15220 \\ \hline 19025 \end{array}$ </div>	<p><u>Count the number of decimal digits</u> How many digits are to the right of the decimal points (behind them)? Count them.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> $\begin{array}{r} 0.761 \\ \times 2.5 \\ \hline 3805 \\ + 15220 \\ \hline 19025 \end{array}$ <p>There are 4 decimal digits.</p> </div>	<p>The number of decimal digits in the product is equal to the sum of the decimal digits from the factors.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> $\begin{array}{r} 0.761 \\ \times 2.5 \\ \hline 3805 \\ + 15220 \\ \hline 1,9025 \end{array}$ </div>
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Find the Products.

(1) 23.4×8.5	(2) 44.13×0.91	(3) 5.706×4.62
(4) 291.05×3.8	(5) 0.0498×0.76	(6) 6.5×32.003

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How can grids help us learn about multiplying decimals?

Answer:

Find the product of 38.14×6.9

1. Fill in spaces with decimals and decimal points. Line up the decimals and annex (add) zeroes where necessary.

			3	8	.	1	4
			x	6	.	9	0

2. Multiply decimals like whole numbers. Do not use the decimal point in this step. Shade the decimal digits.

			3	8	.	1	4
			x	6	.	9	0
		3	4	3	2	6	0
+	2	2	8	8	4	0	0
	2	6	3	1	6	6	0

3. Count the shaded decimal digits and shade the same number of digits in product. Rewrite product with decimal point.

			3	8	.	1	4
			x	6	.	9	0
		3	4	3	2	6	0
+	2	2	8	8	4	0	0
	2	6	3	1	6	6	0
2	6	3	.	1	6	6	0

The product of 38.14×6.9 is 263.1660 or 263.166.

What is the product of 7.2×3.81 ?

What is the product of 9.5×0.408 ?

What is the product of 0.2×0.577 ?

What is the product of 132.8×4.1 ?

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Missing Pieces

Math-Mazing Thing: Multiplying Decimals

I am one of the oldest living things on Earth. I am over 5,000 years old.
No one knows my exact location, but I live in a park somewhere in California.

There are others like me, but they are younger than I am. Who am I?

To learn the name of this Math-Mazing thing, find the products.

Use each code letter to fill in the blank spaces above the numbers.

P. 5.2×3.8	S. 0.21×0.6	O. 0.5×5.5	B. 1.3×0.03
E. 12.6×0.7	R. 1.53×11	N. 4.4×0.03	T. 37.5×0.04
L. 9×0.4	I. 8.7×2.5	C. 6.99×0.9	

0.039	16.83	21.75	0.126	1.5	3.6	8.82	6.291	2.75	0.132	8.82

19.76	21.75	0.132	8.82

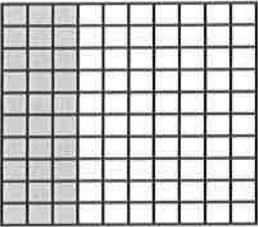
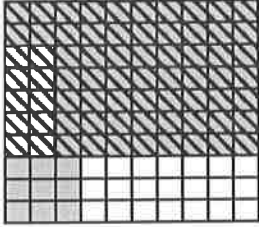
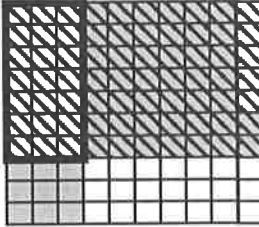
Use a QR Reader on a smartphone or tablet to view an image.

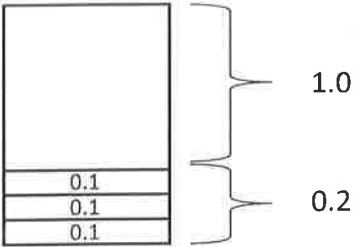


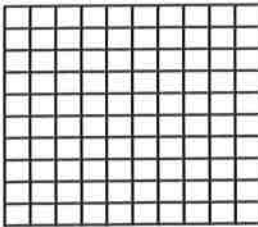
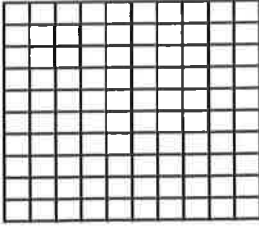
_____ grow in several Western states in the United States, including Colorado and California. They can be found in high elevations. They grow very slowly, but can reach heights of more than 50 feet. They thrive despite living in areas with high winds and freezing temperatures. They are special because they can live for thousands of years. The oldest one is more than 5,000 years old. Its location has not been identified to protect it from harm.

*Circle the number in the paragraph that represents the product of $6,205 \times 0.8$.

Modeling Decimal Multiplication

10 x 10 Grids		
Model the first factor	Model the second factor	Count the "shared squares"
<p>To model 0.3×0.7, start by shading 0.3.</p> 	<p>Model 0.7 perpendicular to 0.3. Use lines or dots to show a difference in the factors.</p> 	<p>The product is represented by the squares where the patterns overlap.</p>  <p style="text-align: center;">21 squares overlap so the product. $0.3 \times 0.7 = 0.21$</p>

Area Models																																		
<p>To model 1.3×2.2, start by drawing a square that represents 1.0 and rectangles that represents 0.3.</p> 	<p>Add squares and rectangles to model 2.2. The smaller rectangles represent 0.01.</p> <table border="1" style="margin: 0 auto; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 25%; height: 40px;">1.0</td> <td style="width: 25%; height: 40px;">1.0</td> <td style="width: 12.5%; height: 40px;">0.1</td> <td style="width: 12.5%; height: 40px;">0.1</td> </tr> <tr> <td style="height: 20px;"> </td> <td style="height: 20px;"> </td> <td style="height: 20px;"> </td> <td style="height: 20px;"> </td> </tr> <tr> <td style="height: 20px;"> </td> <td style="height: 20px;"> </td> <td style="height: 20px;"> </td> <td style="height: 20px;"> </td> </tr> <tr> <td style="height: 20px;"> </td> <td style="height: 20px;"> </td> <td style="height: 20px;"> </td> <td style="height: 20px;"> </td> </tr> </table> <p style="font-size: small; text-align: center;">More shapes are added to bottom of the model because multiplying by 2.2 means adding $1.3 + 1.3$ (2.6) and part of 1.3 (0.26).</p>	1.0	1.0	0.1	0.1													<p>Count the values of the squares and rectangles to find the product.</p> <table border="1" style="margin: 0 auto; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 25%; height: 40px;">1.0</td> <td style="width: 25%; height: 40px;">1.0</td> <td style="width: 12.5%; height: 40px;">0.1</td> <td style="width: 12.5%; height: 40px;">0.1</td> </tr> <tr> <td style="height: 20px;">0.1</td> <td style="height: 20px;">0.1</td> <td style="height: 20px;">0.01</td> <td style="height: 20px;">0.01</td> </tr> <tr> <td style="height: 20px;">0.1</td> <td style="height: 20px;">0.1</td> <td style="height: 20px;">0.01</td> <td style="height: 20px;">0.01</td> </tr> <tr> <td style="height: 20px;">0.1</td> <td style="height: 20px;">0.1</td> <td style="height: 20px;">0.01</td> <td style="height: 20px;">0.01</td> </tr> </table> <p style="text-align: center; font-size: small;"> $(2 \times 1.0) + (8 \times 0.1) + (6 \times 0.01) = 2.86$ Therefore, $1.3 \times 2.2 = 2.86$ </p>	1.0	1.0	0.1	0.1	0.1	0.1	0.01	0.01	0.1	0.1	0.01	0.01	0.1	0.1	0.01	0.01
1.0	1.0	0.1	0.1																															
1.0	1.0	0.1	0.1																															
0.1	0.1	0.01	0.01																															
0.1	0.1	0.01	0.01																															
0.1	0.1	0.01	0.01																															

Your Turn														
<p>Model the product of 0.4×0.5 on the grid.</p>  <p style="margin-top: 20px;">What is the product? _____</p>	<p>Model the product of 0.9×0.6 on the grid.</p>  <p style="margin-top: 20px;">What is the product? _____</p>	<p>Find the value of 1.4×2.1 based on the area model</p> <table border="1" style="margin: 0 auto; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 33%; height: 40px;">1.0</td> <td style="width: 33%; height: 40px;">1.0</td> <td style="width: 33%; height: 40px;">0.1</td> </tr> <tr> <td style="height: 20px;">0.1</td> <td style="height: 20px;">0.1</td> <td style="height: 20px;">0.01</td> </tr> <tr> <td style="height: 20px;">0.1</td> <td style="height: 20px;">0.1</td> <td style="height: 20px;">0.01</td> </tr> <tr> <td style="height: 20px;">0.1</td> <td style="height: 20px;">0.1</td> <td style="height: 20px;">0.01</td> </tr> </table> <p style="margin-top: 20px;">What is the product? _____</p>	1.0	1.0	0.1	0.1	0.1	0.01	0.1	0.1	0.01	0.1	0.1	0.01
1.0	1.0	0.1												
0.1	0.1	0.01												
0.1	0.1	0.01												
0.1	0.1	0.01												

Multiplying Decimals Exit Ticket

Name _____
Class _____
Date _____

Find the product.

1. 376.82×0.01

2. 12.89×4.05

Multiplying Decimals Exit Ticket

Name _____
Class _____
Date _____

Find the product.

1. 376.82×0.01

2. 12.89×4.05

Multiplying Decimals Exit Ticket

Name _____
Class _____
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Name _____
Class _____
Date _____

Find the product.

1. 376.82×0.01

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Multiplying Decimals Exit Ticket

Name _____
Class _____
Date _____

Find the product.

1. 376.82×0.01

2. 12.89×4.05

Multiplying Decimals Exit Ticket

Name _____
Class _____
Date _____

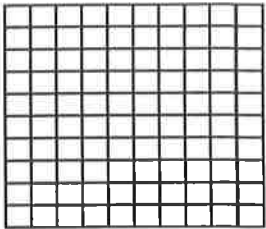
Find the product.

1. 376.82×0.01

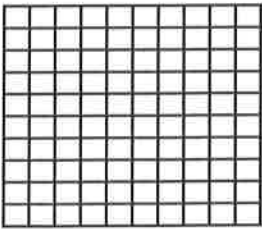
2. 12.89×4.05

Multiplying Decimals Homework

Part I: Decimal Operations Review

<p>1. What is the sum of 76.009 and 8.412?</p>	<p>2. What is the difference between 0.9 and 0.0863?</p>	<p>3. Model the sum of $0.14 + 0.7$ on the grid.</p> <div style="text-align: center;">  </div>
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Part II: Multiplying Decimals

<p>4. What is the product of 3.9×0.441?</p>	<p>5. What is the product of 2.51×0.96?</p>						
<p>6. What is the product of 0.821×0.4?</p>	<p>7. What is the product of 0.9×1.37?</p>						
<p>8. Model the product of 0.7×0.3 on the grid.</p> <div style="text-align: center;">  </div>	<p>9. Write the expression and the product represented by the model.</p> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse;"> <tr> <td style="padding: 5px;">1.0</td> <td style="padding: 5px;">0.1</td> </tr> <tr> <td style="padding: 5px;">0.1</td> <td style="padding: 5px;">0.01</td> </tr> <tr> <td style="padding: 5px;">0.1</td> <td style="padding: 5px;">0.01</td> </tr> </table> </div>	1.0	0.1	0.1	0.01	0.1	0.01
1.0	0.1						
0.1	0.01						
0.1	0.01						

10. Neal stated that the product of 34.982×10 was 3.4982. What was Neal's mistake? What is the value of 34.982×10 ?
