

3.4 Multiplying a Decimal Less than 1 by a Whole Number

Explore:

Complete the multiplication statements. You can use a calculator.

$1 \times 1 =$ 1	$0.1 \times 1 =$ 0.1	$0.01 \times 1 =$ 0.01
$1 \times 2 =$ 2	$0.1 \times 2 =$ 0.2	$0.01 \times 2 =$ 0.02
$1 \times 3 =$ 3	$0.1 \times 3 =$ 0.3	$0.01 \times 3 =$ 0.03
$1 \times 4 =$ 4	$0.1 \times 4 =$ 0.4	$0.01 \times 4 =$ 0.04

What pattern do you see?

As the number that the whole number gets multiplied by gets smaller, what happens to the product?

product gets smaller

How are the products each row (---→) alike? How are they different?

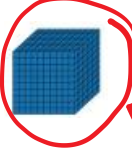
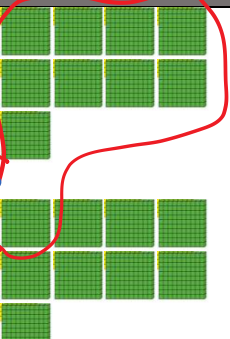
same numbers / different place values

3.4 Multiplying a Decimal Less than 1 by a Whole Number

When you multiply a decimal **less** than 1 by a whole number, the product is **less** than the whole number.

Multiply 0.9×2 .



You can use place value charts to multiply a decimal less than 1 by a whole number:

Multiply	Ones	Tenths
0.9×2		
0.9		
0.9		


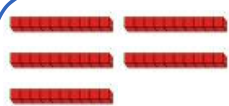

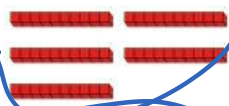

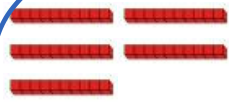

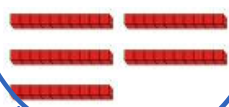


Nine tenths multiplied by 2 is **18 tenths**.

Trade 10 tenths for 1 one. **1 tenth + 8 tenths = 1.8**







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Multiply	Ones	Tenths
$0.9 \times 2 = 1.8$		
1.8		

Multiply 0.15 x 4.

Multiply	Ones	Tenths	Hundredths
0.15 x 4			
0.15			
0.15			
0.15			
0.15			
			
			

=

Multiply	Ones	Tenths	Hundredths
0.15 x 4			
			
			
			
			
			
			

0 ones + 6 tenths + 0 hundredths = 0.60

So, $0.15 \times 4 = 0.60$

Multiply 0.0138 by 9.

You can also use your super written multiplication skills to help you find the answer!

Step 1: Write out the question in two rows.

Step 2: Multiply each digit of your decimal by your whole number (don't worry about the decimal yet).

Step 3: Count how many place values there are in **total** after the decimal in your factors (the numbers being multiplied).

Step 4: place your decimal so that the **total** number of **place values** past the decimal in your factors equals the **total number** of place values in your **product**.

$$\begin{array}{r} \overset{1}{0}.\overset{3}{0}\overset{7}{1}38 \\ \times 9 \\ \hline 0.1242 \end{array}$$

You try:

<p>Multiply 0.5 by 3.</p> $\begin{array}{r} 0.5 \\ \times 3 \\ \hline 1.5 \end{array}$	<p>Multiply 0.72 by 4.</p> $\begin{array}{r} 0.72 \\ \times 4 \\ \hline 2.88 \end{array}$	<p>Multiply 0.042 by 5.</p> $\begin{array}{r} 0.042 \\ \times 5 \\ \hline 0.210 \end{array}$
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Key take away: decimals less than one multiplied by whole numbers result in products that are less than the whole number.

Homework: p. 101 # 1-3 odds, 4, 5 6