

# Multiplying Decimals

Multiplication by a whole number is repeated addition. For example,  $3 \times 0.9 = 0.9 + 0.9 + 0.9 = 2.7$

Since we added repeatedly a number with tenths, the answer also had tenths.

Another example:  $5 \times 0.15 = 0.15 + 0.15 + 0.15 + 0.15 + 0.15 = 0.75$

We added repeatedly a number with hundredths, so the answer also had hundredths.

To solve decimal multiplication problems, you can multiply using the algorithm for multiplication in columns. First multiply as if there were no decimal points in the factors (the numbers to be multiplied). Once you get the answer, then put the decimal point where it belongs.

If we added 1.51 repeatedly 46 times, the answer would have hundredth parts (two decimals). That is why we need to put the decimal point in the answer so it leaves two decimals.

$$\begin{array}{r} 1.51 \\ \times 46 \\ \hline 906 \\ 6040 \\ \hline 69.46 \end{array}$$

If we added 0.175 repeatedly 38 times, the answer would have thousandth parts (three decimals). So we need to have three decimals in the answer.

$$\begin{array}{r} 0.175 \\ \times 38 \\ \hline 1400 \\ 5250 \\ \hline 6.650 \end{array}$$

**Note:** To solve  $6 \times 0.05$ , you can multiply  $6 \times 5 = 30$  in your head. When you put a decimal point to the answer 30, it needs to have two decimals, so the answer is .30 or 0.30.

Similarly,  $6 \times 0.005$  needs to have *three* decimals, so the answer will be 0.030. We actually need to put a zero in front of the "30." You can also simply think about thousandth parts:

$$6 \times \frac{5}{1000} = \frac{30}{1000} = 0.030. \text{ Another example: } 1000 \times 0.007. \text{ Multiply } 1000 \times 7 = 7000,$$

and since we need three decimals, the answer is 7.000 or 7.

1. Put the decimal point in the answer.

a. $8 \times 0.4 = 32$	g. $7 \times 0.05 = 35$	m. $4 \times 0.004 = 16$
b. $10 \times 0.4 = 40$	h. $8 \times 0.05 = 40$	n. $5 \times 0.008 = 40$
c. $100 \times 0.4 = 400$	i. $10 \times 0.05 = 50$	o. $3 \times 0.012 = 36$
d. $10 \times 0.4 = 40$	j. $10 \times 0.09 = 90$	p. $10 \times 0.003 = 30$
e. $100 \times 0.4 = 400$	k. $100 \times 0.09 = 900$	q. $100 \times 0.003 = 300$
f. $1000 \times 0.4 = 4000$	l. $1000 \times 0.09 = 9000$	r. $1000 \times 0.003 = 3000$