

Multiply Decimals

When multiplying a decimal by a decimal, multiply as with whole numbers. To place the decimal point, find the sum of the number of decimal places in each factor. The product has the same number of decimal places.

Tutor

STOP and Reflect

How is the product of 4.2×6.7 similar to the product of 42×67 ? How are they different? Explain below.

Examples

1. Find 3.6×0.05 .

Estimate $3.6 \times 0.05 \rightarrow 4 \times 0$ or 0

3.6 ← one decimal place
 $\times 0.05$ ← two decimal places
 0.180 ← three decimal places

The product is 0.180 or 0.18.

• Do NOT line up decimal places!
 • Line both factors up on the right!

Once you place the decimal point, you can drop the zero at the right.

2. Find 0.112×7.2 .

Estimate $0.112 \times 7.2 \approx .1 \times 7$ or $.7$

0.112 has 3 decimal places.

7.2 has 1 decimal place.

So the product has 3 + 1, or 4 decimal places.

	0.	1	1	2	
×			7.	2	
<hr/>					
+					
<hr/>					

← 2 numbers
 } 2 lines of work

The product is _____.

Check for reasonableness _____ \approx _____ ✓

Show your work.

a. _____

b. _____

c. _____

Got it? Do these problems to find out.

a. 5.7×2.8

b. 4.12×0.05

c. 0.014×3.7

Annex a Zero

If there are not enough decimal places in the product, you need to annex zeros to the left.



Examples

3. Find 1.4×0.067 .

$$\begin{array}{r}
 0.067 \quad \leftarrow \text{three decimal places} \\
 \times 1.4 \quad \leftarrow \text{one decimal place} \\
 \hline
 268 \\
 + 67 \\
 \hline
 0.0938 \quad \leftarrow \text{Annex a zero to make four decimal places.}
 \end{array}$$

Remember:
To "Annex" a zero
just means put
a zero in an empty
spot!

4. Find 0.45×0.053 .

The product will have decimal places. Annex zeros, if needed.

$$\begin{array}{r}
 0.45 \\
 \times 0.053 \\
 \hline
 0.00000 \\
 + 0.00000 \\
 \hline
 0.00000
 \end{array}$$

\leftarrow 2 non-zero #s
} 2 lines of work

Check Multiply related whole numbers.

$$\begin{array}{r}
 45 \\
 \times 53 \\
 \hline
 0000 \\
 + 0000 \\
 \hline
 0000
 \end{array}$$

Move the decimal to the left 5 places. What is the number? _____

Is the answer the same?

Got it? Do these problems to find out.

d. 0.04×0.32

e. 0.26×0.205

f. 1.33×0.06

Show your work. \rightarrow

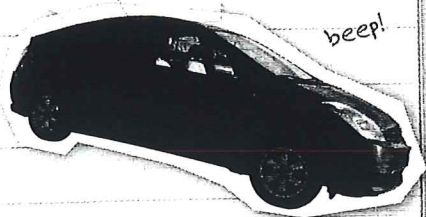
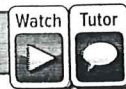
d. _____

e. _____

f. _____



Example



5. A certain car can travel 28.45 miles with one gallon of gasoline. The gasoline tank can hold 11.5 gallons. How many miles can this car travel on a full tank of gas? Justify your answer.

Estimate $28.45 \times 11.5 \rightarrow 30 \times 12$ or 360

$$\begin{array}{r}
 28.45 \quad \leftarrow \text{two decimal places} \\
 \times 11.5 \quad \leftarrow \text{one decimal place} \\
 \hline
 14225 \\
 2845 \\
 + 2845 \\
 \hline
 327.175 \quad \leftarrow \text{The product has three decimal places.}
 \end{array}$$

Handwritten notes: 3 #s, 3 lines of work

The car could travel 327.175 miles. Since 327.175 is close to 360, the answer is reasonable.

Guided Practice



Multiply. (Examples 1-4)



1. $0.6 \times 0.5 =$ _____

2. $27.43 \times 1.089 =$ _____

3. $0.98 \times 7.3 =$ _____

4. $2.7 \times 1.35 =$ _____

5. $0.03 \times 0.09 =$ _____

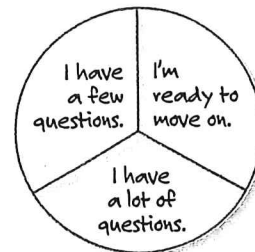
6. $0.04 \times 2.12 =$ _____

7. A mile is equal to approximately 1.609 kilometers. How many kilometers is 2.5 miles? Justify your answer. (Example 5) _____

8. **Building on the Essential Question** Why is estimating not as helpful when multiplying very small numbers such as 0.007 and 0.053? _____

Rate Yourself!

Are you ready to move on? Shade the section that applies.



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Independent Practice

Go online for Step-by-Step Solutions



Multiply. (Examples 1–4)

1. $0.7 \times 0.4 =$ _____



2. $0.4 \times 3.7 =$ _____

3. $0.52 \times 2.1 =$ _____

4. $6.2 \times 0.03 =$ _____

5. $14.7 \times 11.361 =$ _____

6. $0.28 \times 0.08 =$ _____

7 STEM A giraffe can run up to 46.93 feet per second. How far could a giraffe run in 1.8 seconds? Justify your answer. (Example 5)



8. A nutrition label indicates that one serving of apple crisp oatmeal has 2.5 grams of fat. How many grams of fat are there in 3.75 servings? Justify your answer. (Example 5)

9 Financial Literacy Pears cost \$0.92 per pound and apples cost \$1.10 per pound. Mr. Bonilla bought 3.75 pounds of pears and 2.1 pounds of apples. How much did he pay for the pears and apples? Explain your answer.

Multiply.

10. $25.04 \times 3.005 =$ _____

11. $1.03 \times 1.005 =$ _____

12. $5.12 \times 4.001 =$ _____