

Lesson 4-9

Friday, October 11, 2019 2:06 PM

Lesson 4-9 Multiply Decimals

Name: _____

Kate's teacher asked the students to write one digit on each blank and find the products. How would you complete the expressions? Write the products? Solve these problems any way you choose!

a. $0. _ \times 0. _$
 b. $0. _ \times _$
 c. $0. _ \times 0.0 _$
 d. $_ \times 0 _$

I CAN... multiply decimals using the standard algorithm.

Curriculum Standard: 5.NF.B.7
Mathematical Practices: MP1, MP3, MP4, MP7, MP8

Estimate and solve: 3.5×0.21

$3.5 \times 0.21 = x$
 $4 \times 0.2 = 0.8$

3.5 1dp
 $\times 0.21$ +2dp
 $\hline 35$
 $+700$
 $\hline 0.735$

0.21
 $\times 3.5$
 $\hline 105$
 $+1630$
 $\hline 0.735$

Look Back! **MP8 Generalize** How many decimal places will there be in the product of 3.5 and 0.21? Explain.

3 decimal places. 3.5 has 1 decimal place, 0.21 has 2 decimal places. The product has 3 decimal places (unless it is an equivalent decimal).

How Can You Use the Standard Algorithm to Multiply Decimals?

Melissa is making fruit punch. She wants to make 2.5 batches using the recipe shown.

Are! Sandy's Fruit Punch:

- 0.5 liter sparkling water
- 1.5 liters strawberry juice
- 1 liter orange juice
- 6 tablespoons sugar

You can use the standard multiplication algorithm to multiply 1.5×2.5 .

Step 1 Estimate the product. Use compatible numbers that you can multiply mentally.

1.5×2.5
 $2 \times 2.5 = 5$ liters

Step 2 Multiply as you would with whole numbers.

25
 $\times 15$
 $\hline 125$
 $+250$
 $\hline 375$

Since 2 is greater than 1.5, 5 is an overestimate.

Step 3 Add the number of decimal places in each factor to find the number of decimal places in the product.

Since there is a total of 2 decimal places in the factors, there will be 2 decimal places in the product. Melissa needs to use 3.75 liters of cranberry juice.

3.75 liters is a little less than the estimate of 5 liters, so the answer is reasonable.

Convince Me! **MP7 Look for Relationships** How many tablespoons of sugar does Melissa need? Explain how you found the answer.

$6 \times 2.5 = 15$
 $6 \times 3 = 18$
 15 tablespoons

32.5 1dp
 $\times 6$ +0dp
 $\hline 195.0$ 1dp

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Name: _____

Another Example

Find 0.5×0.03 .

Multiply as you would with whole numbers.

5
 $\times 3$
 $\hline 15$

0.5 1 decimal place
 $\times 0.03$ 2 decimal places
 $\hline 0.015$ 3 decimal places

Remember, a tenth times a hundredth equals a thousandth.

Use number sense or estimation to check your answer.

Since $0.5 < 1$, the product must be less than the other factor, 0.03. $0.015 < 0.03$, so the answer is reasonable.

Guided Practice

Do You Understand?

1. Sasha wants to multiply 0.5×0.8 . How many decimal places will the product have? Explain.

$0.5 \times 0.8 = 0.40 = 0.4$
 1dp + 1dp = 2dp
 1 decimal place. It's an equivalent decimal.

2. If $112 \times 38 = 4,256$, what is the product of 1.12×3.8 ?

1.12 is $\frac{112}{100}$
 3.8 is $\frac{38}{10}$
 $\frac{112}{100} \times \frac{38}{10} = \frac{4256}{1000} = 4.256$

Do You Know How?

In 3–6, find each product. Use number sense or estimation to check your answer.

12.5 4. 9.1
 $\times 0.22$ $\times 6.8$
 \hline \hline

0.8 0.4 0.07
 $\times 5.4$
 \hline

1 decimal place. It's an equivalent decimal. 0.8×5.4
 2. If $112 \times 38 = 4,256$, what is the product of 1.12×3.8 ? 4.256

1.12 is $\frac{100}{100}$ of 112
 3.8 is $\frac{10}{10}$ of 38

Independent Practice

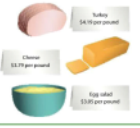
In 7-14, find each product. Use number sense or estimation to check your answer.

7. 0.4×1.3 8. 0.63×5.5 10. 10.3×0.3
 11. 2.9×2.9 12. 27×4.9 14. 5.6×100
- Handwritten notes for problem 8:*
 $0.63 \times 5.5 = 3.465$
 $\frac{63}{100} \times \frac{55}{10} = \frac{3465}{1000} = 3.465$

Math Practices and Problem Solving

15. **MP.6 Be Precise** Preston bought a drum set priced at \$187.90. The sales tax was found by multiplying the price of the drum set by 0.08. What was the total cost of the drum set with sales tax? Round to the nearest cent.
 16. Ms. White drives 8 miles each way to her office. If she does this 5 days each week for 10 weeks, how many total miles will she drive?

17. **MP.1 Make Sense and Persevere** Jordan bought 3.8 pounds of turkey, 2.2 pounds of cheese, and 3.6 pounds of egg salad for a party. What was the total cost before sales tax? Round your answer to the nearest cent.



18. **Higher Order Thinking** How many decimal places do you think are in the product of $3.2 \times 0.77 \times 1.6$? Explain. Then multiply to check.

$3.2 \times 0.77 \times 1.6 = 3.9424$

Common Core Assessment

19. Ella measured some of the distances on a map of her county. On the map, each inch represents 4.5 miles.



Part A
 What is the actual distance between the airport and the railway museum?

Part B
 What is the actual distance between the airport and the fairgrounds?

$$\begin{array}{r} 32 \\ \times 0.77 \\ \hline 224 \\ +2240 \\ \hline 2.464 \end{array}$$

$$\begin{array}{r} 2.464 \\ \times 1.6 \\ \hline 14784 \\ +24640 \\ \hline 3.9424 \end{array}$$

$3 \times 5 = 15$
 2.5×4.5

$$\begin{array}{r} 2.5 \\ \times 4.5 \\ \hline 125 \\ +1000 \\ \hline 11.25 \text{ miles} \end{array}$$

$2 \times 5 = 10$
 1.75×4.5

$$\begin{array}{r} 1.75 \\ \times 4.5 \\ \hline 875 \\ +7000 \\ \hline 7.875 \text{ miles} \end{array}$$