

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## MULTIPLYING DECIMALS

### N-GEN MATH<sup>®</sup> 6



Multiplying decimals is more difficult than adding them. But, we can still understand how to multiply decimals by recalling that they are **fractions with denominators that are powers of 10, like 10, 100, and 1000**. Let's first review an important fact about multiplying and dividing decimals by powers of 10.

**Exercise #1:** What happens when we multiply 2.43 by 10? Find  $10 \times 2.43$  by finishing the multiplication problem below. Express your answer as a decimal.

$$10 \times 2.43 = 10 \times \left( 2 + \frac{4}{10} + \frac{3}{100} \right) =$$

Whenever we multiply by powers of 10 the decimal place moves to the **right**. Whenever we divide by powers of 10 it moves to the **left**. Review this in the following exercise.

**Exercise #2:** Write each of the following as a decimal. Recall that fractions are the same as division.

(a)  $7.389 \times 10$

(b)  $2.935 \times 100$

(c)  $4.2 \times 1000$

(d)  $5.7 \div 10$

(e)  $30 \div 100$

(f)  $7.89 \div 1000$

(g)  $\frac{734}{100}$

(h)  $\frac{1936}{1000}$

We are now ready to start learning the **standard method** (or standard algorithm) for multiplying two numbers that include decimals.

**Exercise #3:** Let's consider the following product:  $0.3 \times 0.7$

(a) Write each decimal as a fraction and perform the multiplication.

(b) Write your fractional answer from (a) as a decimal. How many decimal places does it have?



We could have done the last problem by simply finding the product of 3 and 7, i.e. 21, and then moving the decimal place two places to the left, from 21.0 to 0.21. Let's try another one.

**Exercise #4:** Consider the product  $0.24 \times 0.7$

- (a) Write each decimal as an equivalent fraction with a denominator that is a power of 10.
- (b) Find the product of the two fractions and express your final answer as a decimal.

**Exercise #5:** Matt believes that  $0.3 \times 0.2$  is equal to 0.6. Is Matt correct? If so, explain why. If not, show what the correct answer is.

The general method for finding the product of two decimals is hard to state concisely, but the method is described below.

### STANDARD METHOD FOR MULTIPLYING DECIMALS

Multiply the two numbers as if they are whole numbers (without decimal points). After the whole number product is found, count the number of decimal places from the original two numbers and then move the decimal point of the result that many places to the left.

**Exercise #6:** Find each of the following products using the standard method.

(a)  $0.7 \times 0.2$

(b)  $0.85 \times 0.02$

(c)  $5.2 \times 0.5$

(d)  $2.6 \times 6.7$

(e)  $12 \times 0.27$

(f)  $3.85 \times 0.26$



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**MULTIPLYING DECIMALS**  
**N-GEN MATH<sup>®</sup> 6 HOMEWORK**

**FLUENCY**

1. Find each of the following products by first changing the decimals into equivalent fractions and then changing back to a decimal once you have the product as a fraction.

(a)  $0.5 \times 0.7$

(b)  $0.8 \times 0.2$

(c)  $3.5 \times 0.6$

2. The product of 0.42 with 0.2 can be written in fraction form as which of the following?

(1)  $\frac{84}{10}$

(3)  $\frac{84}{1000}$

(2)  $\frac{84}{100}$

(4)  $\frac{84}{10000}$

3. Find each of the following products using the standard method. Show your steps.

(a)  $0.4 \times 0.4$

(b)  $0.9 \times 0.3$

(c)  $0.2 \times 0.4$

(d)  $5 \times 6.7$

(e)  $2.5 \times 8.1$

(f)  $3.2 \times 0.18$



4. Find each of the following more challenging decimal products using the standard method. Show your work.

(a)  $0.62 \times 8.24$

(b)  $0.785 \times 0.061$

(c)  $14.56 \times 2.82$

### USING YOUR MATH

5. Joey filled up his car with 8.2 gallons of gasoline. If each gallon costs \$3.76, then find the amount of money Joey spent on gasoline. Round your answer to the nearest *hundredth* (the nearest cent). Show your work. Check your answer using a calculator if available.

6. Gold weighs 19.32 grams per cubic centimeter. If a gold coin contains 2.4 cubic centimeters of gold, how much does it weigh in grams? Show your work.

### REVIEWING YOUR MATH

7. If a roll of fabric is  $7\frac{1}{2}$  yards long and is to be cut into pieces that are  $\frac{5}{8}$  of a yard each, how many pieces can be cut? Justify your answer.

