



# MATH NEWS

## Grade 5 | Module 2 | Topic C | Decimal Multi-Digit Multiplication

### Welcome

This document is created to give parents and students a better understanding of the math concepts found in the Eureka Math (© 2013 Common Core, Inc.) that is also posted in the Engage New York material taught in the classroom. Grade 5 Module 2 of Eureka Math (Engage New York) Multi-Digit Whole Number and Decimal Fraction Operations. This newsletter will address decimal multi-digit multiplication.

### Words to Know

- Product
- Estimate
- Decimal Fraction
- Factor
- Standard Algorithm

### Online Practice

Looking for assistance for to help complete nightly homework? Check out the following website to get digital copies of homework, as well as detailed explanations in video format: [http://www.oakdale.k12.ca.us/cms/page\\_view?d=x&piid=&vpid=1401784829350](http://www.oakdale.k12.ca.us/cms/page_view?d=x&piid=&vpid=1401784829350). Visit [www.zearn.com](http://www.zearn.com) for extra practice as well!

### Important Information

#### *Objectives of Topic C*

- Multiply decimal fractions with tenths by multi-digit whole numbers using place value understanding to record partial products.
- Multiply decimal fractions by multi-digit whole numbers through conversion to a whole number problem and reasoning about the placement of the decimal.
- Reason about the product of a whole number and a decimal with hundredths using place value understanding and estimation.

#### *Things to Remember*

- A decimal fraction uses a point to separate the whole number part from the fractional part of a number. Example: in the number 36.9 the point separates the 36 (the whole number part) from the 9 (the fractional part, which means 9 tenths). So 36.9 is 36 and nine tenths.
- When multiplying by a decimal fraction, convert the decimal fraction to a whole number by multiplying it by the power of 10 (10 or 100) depending on the number of places after the decimal point. The problem now resembles a whole number multiplication problem. Once you finish multiplying, you need to divide the answer by the power of 10 you multiplied by.
- If the decimal fraction has one place after the decimal, you multiply by 10. The digits will shift one place to the left. The result is a number that is 10x greater than the original number. If the decimal has two places after the decimal, you multiply by 100. The digits will shift two places to the left. The result is a number that is 100x greater than the original number.
- When a number is divided by 10, the digits shift one place to the right. The result is a number  $\frac{1}{10}$  as large as the original number. When a number is divided by 100, the digits shift two places to the right. The result is a number  $\frac{1}{100}$  as large as the original number.

## Example Problems

**Problem 1:** Solve using **standard algorithm**.

$$54 \times 3.5$$

$54 \times 3.5 \xrightarrow{\times 10} 540 \times 0.35 \xrightarrow{+ 10} 189.0$   

$$\begin{array}{r} 3.5 \\ \times 54 \\ \hline 140 \\ + 1750 \\ \hline 1890 \\ 1890 \div 10 = 189.0 \end{array}$$

**Problem 2:** Round the **factors** to **estimate** the **products**. (Symbol  $\approx$  means about).

Solve.

$7.5 \times 52$	$17.6 \times 22$	$95 \times 3.3$
$\approx 8 \times 50$	$\approx 18 \times 20$	$\approx 100 \times 3$
$= 400$	$= 360$	$= 300$

**Problem 3:** **Estimate** the **product**. Solve using an **area model** and the **standard algorithm**.

Solve  $4.7 \times 24$       Estimation:  $4.7 \times 24 \approx 5 \times 20$

### Standard Algorithm

$$\begin{array}{r} 4.7 \\ \times 24 \\ \hline 188 \\ + 940 \\ \hline 1128 \\ 1128 \div 10 = 112.8 \end{array}$$

### Area Model

	40	7 tenths	
4	160	28	= 188
20	800	140	= 940
			1128 tenths = 112.8

When we compare our answer (112.8) to our estimate (100), we can conclude that our answer is reasonable.

## Application Problems and Answers

**Problem:** Pat rides his bike a total of 6.83 miles to and from school every day. How many miles does he ride

$$25 \times 6.83 \xrightarrow{\times 100} 17075 \xrightarrow{\div 100} 170.75$$

6.83 miles x 25 days	6.83 (x 100)	<u>683</u>
	x 25	x 25
		<u>3415</u>
		+ 13660
		17075

$17075 \div 100 = 170.75$   
 Pat rides his bike a total of 170.75 miles in 25 days.

**A.** Courtney buys 79 protractors at \$1.09 and 32 composition notebooks at \$2.19 each. About how much money did she spend?

$\$1.09 / \text{protractor} \times 79 \text{ protractors} \approx \$1 \times 80 = \$80$

$\$2.19 / \text{notebook} \times 32 \text{ notebooks} \approx \$2 \times 30 = \$60$

$\$80 + \$60 = \$140$

Courtney spent about \$140 on protractors and notebooks.

**B.** How much money did she actually spend?

79 x \$1.09	\$1.09 (x 100)	<u>109</u>
	x 79	x 79
		<u>1981</u>
		+ 7630
		8611

$8611 \div 100 = \$86.11$  cost of protractor

32 x \$2.19	\$2.19 (x 100)	<u>219</u>
	x 32	x 32
		<u>1438</u>
		+ 6570
		7008

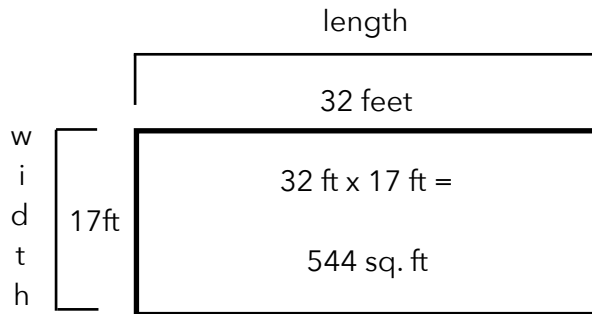
$7008 \div 100 = \$70.08$  cost of notebooks

$\$86.11$  cost of protractors  
 $+ \$70.08$  cost of notebooks  
 $\$156.19$  total cost of supplies

Courtney actually spent \$156.19.

### Application Problems and Answers (cont.)

**Problem:** A kitchen measures 32 feet by 17 feet. If tile costs \$7.98 per square foot, what is the total cost of putting tile in the kitchen?



$$\begin{array}{r} \$7.98 \text{ (x 100)} \longrightarrow 312 \\ \times \quad 544 \\ \hline 3192 \\ 31920 \\ + 399000 \\ \hline 434112 \\ 434112 \div 100 = \$4,341.12 \end{array}$$

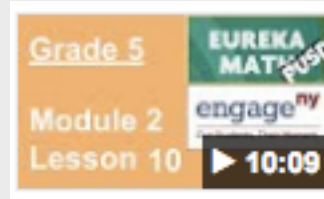
The total cost of putting tile in the kitchen is \$4,341.12.

**Note:** Area refers to the number of square units needed to cover the inside of a shape. To determine the area of this rectangle you multiply the length times the width. The formula for **area** is **Area = length x width**.

### Flipped Learning

Flipped learning is a great way to review topics that your student is learning in the classroom. The following are links to videos that give detailed explanations for each lesson in this topic.

Lesson 10: [https://www.youtube.com/watch?v=EzgtnQQ\\_S0Q](https://www.youtube.com/watch?v=EzgtnQQ_S0Q)



Lesson 11: <https://www.youtube.com/watch?v=8D8MUUz70BA>



Lesson 12: [https://www.youtube.com/watch?v=3M5nHME\\_nzg](https://www.youtube.com/watch?v=3M5nHME_nzg)

