



# MATH NEWS



Grade 5, Module 2, Topic C

## 5<sup>th</sup> Grade Math

Module 2: Multi-Digit Whole Number and Decimal Fraction Operations

### Math Parent Letter

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

Topic C. Decimal Multi-Digit Multiplication

### Words to know

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

### 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 really means 9 tenths). So 36.9 is 36 and nine tenths.
- When multiplying by a decimal fraction, you convert the decimal fraction to a whole number by multiplying it by a 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 then have to divide the answer by the same power of 10 you multiplied by.
- If the decimal fraction has one place after the decimal, you multiply by 10. The digits will then shift one place to the left. The result is a number that is 10 times 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 100 times 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 that is  $\frac{1}{10}$  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 that is  $\frac{1}{100}$  as large as the original number.

## 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.

## Focus Area– Topic C

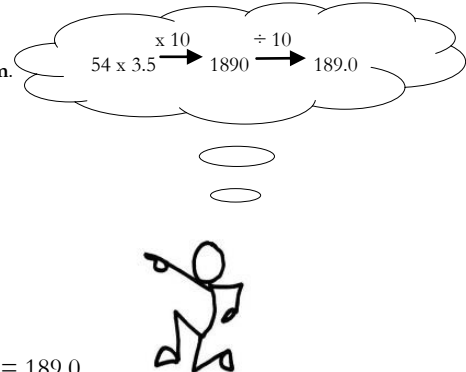
Module 2: Multi-Digit Whole Number and Decimal Fraction Operations

### Problem 1

Solve using **standard algorithm**.

$$54 \times 3.5$$

$$\begin{array}{r}
 3.5 \xrightarrow{\times 10} 35 \\
 \times 54 \\
 \hline
 140 \\
 + 1750 \\
 \hline
 1890 \\
 1890 \div 10 = 189.0
 \end{array}$$



### Problem 2

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

Solve

$$\begin{array}{lll}
 7.5 \times 52 & 17.6 \times 22 & 95 \times 3.3 \\
 \approx 8 \times 50 & \approx 18 \times 20 & \approx 100 \times 3 \\
 = 400 & = 360 & = 300
 \end{array}$$



### Problem 3

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

Solve:  $4.7 \times 24$

$$\left. \begin{array}{l} 4.7 \times 24 \\ \approx 5 \times 20 \end{array} \right\} \text{Estimation}$$

### Standard Algorithm

$$\begin{array}{r}
 4.7 \xrightarrow{\times 10} 47 \\
 \times 24 \\
 \hline
 188 \\
 + 940 \\
 \hline
 1128 \\
 1128 \div 10 = 112.8
 \end{array}$$

### Area Model

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

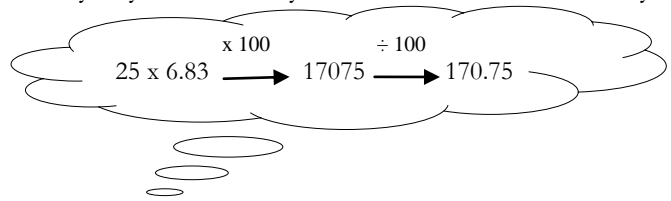
When we compare our answer (112.8) to our estimate (100), we can conclude that our answer is reasonable.



*Example Problems and Answers*

Pat rides his bike a total of 6.83 miles to and from school every day. How many miles does he ride in 25 days?

$$\begin{array}{r}
 6.83 \text{ miles} \times 25 \text{ days} \\
 \begin{array}{r}
 6.83 \text{ (x 100)} \longrightarrow 683 \\
 \times 25 \\
 \hline
 3415 \\
 + 13660 \\
 \hline
 17075 \\
 17075 \div 100 = \underline{170.75}
 \end{array}
 \end{array}$$



**Pat rides his bike a total of 170.75 miles in 25 days.**



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

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

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

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

**Courtney spent about \$140 on protractors and notebooks.**

B. How much money did she actually spend?

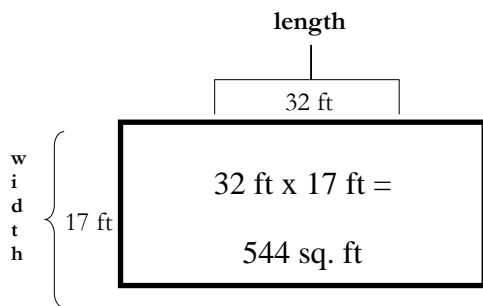
$  \begin{array}{r}  79 \times \$1.09 \\  \begin{array}{r}  \$1.09 \text{ (x 100)} \longrightarrow 109 \\  \times 79 \\  \hline  981 \\  + 7630 \\  \hline  8611 \\  8611 \div 100 = \$86.11 \text{ cost of protractor}  \end{array}  \end{array}  $	$  \begin{array}{r}  32 \times \$2.19 \\  \begin{array}{r}  \$2.19 \text{ (x 100)} \longrightarrow 219 \\  \times 32 \\  \hline  438 \\  + 6570 \\  \hline  7008 \\  7008 \div 100 = \$70.08 \text{ cost of notebooks}  \end{array}  \end{array}  $
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$$\begin{array}{r}
 \$86.11 \text{ cost of protractors} \\
 + \$70.08 \text{ cost of notebooks} \\
 \hline
 \$156.19 \text{ total cost of supplies}
 \end{array}$$

**Courtney actually spent \$156.19.**



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



$$\begin{array}{r}
 \$7.98 \text{ (x 100)} \longrightarrow 798 \\
 \times 544 \\
 \hline
 3192 \\
 31920 \\
 + 399000 \\
 \hline
 434112 \\
 434112 \div 100 = \$4,341.12
 \end{array}$$

**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**.