



MATH NEWS



Grade 5, Module 2, Topic A

5th 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 discuss Module 2, Topic A.

Topic A. Mental Strategies for Multi-Digit Whole Number Multiplication

Words to know

- Product
- Associative Property
- Commutative Property
- Distributive Property
- Estimate
- Factor
- Equation

Things to Remember:

- **Commutative Property** – The word "commutative" comes from "commute" or "move around", so the Commutative Property is the one that refers to moving stuff around. Example: $2 \times 3 = 3 \times 2$
- **Associative Property** - The word "associative" comes from "associate" or "group"; the Associative Property is the rule that refers to grouping. Example: $5 \times 7 \times 2 = (5 \times 2) \times 7$
- **Distributive Property** - The Distributive Property is easy to remember, if you recall that "multiplication *distributes* over addition". Example: $43 \times 6 = (40 \times 6) + (3 \times 6)$
- Symbol for meaning 'about' - $\approx$
- When multiplying whole numbers by multiples of 10 you **cannot always count zeros in the factors** and end up with the correct product.

$$\begin{array}{rcl}
 5,000 \times 60 & \neq & 30,000 \\
 (3 \text{ zeros}) \quad (1 \text{ zero}) \quad (4 \text{ zeros}) & & \\
 5,000 \times 60 & = & 5 \times 1,000 \times 6 \times 10 \\
 & = & (5 \times 6) \times (1,000 \times 10) \\
 & = & 30 \times 10,000 = 300,000
 \end{array}$$

OBJECTIVES OF TOPIC A

- Multiply multi-digit whole numbers and multiples of 10 using place value patterns and the distributive and associative properties.
- Estimate multi-digit products by rounding factors to a basic fact and using place value patterns.

Focus Area– Topic A

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

Find the **product**. Show your thinking

$$\begin{array}{rcl}
 6 \times 70 & & 80 \times 50 \\
 = 6 \times 7 \times 10 & & = (8 \times 10) \times (5 \times 10) \\
 = 42 \times 10 & & = (8 \times 5) \times (10 \times 10) \leftarrow \text{Associative Property} \\
 = 420 & & = 40 \times 100 \\
 & & = 4,000
 \end{array}$$

$$\begin{array}{rcl}
 542 \times 3 & & \\
 = (500 \times 3) + (40 \times 3) + (2 \times 3) \leftarrow \text{Distributive Property} \\
 = 1,500 + 120 + 6 \\
 = 1,626
 \end{array}$$



Round the **factors** to **estimate** the **products**.

$$\begin{array}{rcl}
 867 \times 46 \approx 900 \times 50 & & 7,231 \times 25 \approx 7,000 \times 30 \\
 = 45,000 & & = 210,000
 \end{array}$$



Determine if these **equations** are true or false. Defend your answer using your knowledge of place value and the **commutative, associative and/or distributive property**.

$$\begin{array}{rcl}
 850 \times 6 \times 10 & = & 85 \times 6 \times 100 \text{ -- these equations are TRUE} \\
 \downarrow & & \swarrow \\
 (85 \times 10) \times 6 \times 10 & = & 85 \times 6 \times (10 \times 10) \\
 85 \times 6 \times 10 \times 10 & = & 85 \times 6 \times 10 \times 10
 \end{array}$$

$$77 \times 30 \times 10 = 770 \times 3 \text{ -- these equations are FALSE}$$

$$\begin{array}{rcl}
 (77 \times 10) \times 30 & = & 770 \times 3 \\
 \downarrow & & \\
 770 \times 30 & \neq & 770 \times 3
 \end{array}$$



Example Problems and Answers

Laura wants to buy a new car. If the car payment each month is \$367 for 5 years, about how much will the car cost her after the five year?

\$367 is about \$400 --- there are 12 months in a year

$$\begin{aligned} & \$400 \times 12 \\ &= (4 \times 100) \times 12 \\ &= (4 \times 12) \times 100 \\ &= 48 \times 100 \\ &= 4,800 \end{aligned}$$

For 5 years --- $\$4,800 \times 5$

$$\begin{aligned} & \downarrow \\ &= (48 \times 100) \times 5 \\ &= 48 \times 5 \times 100 \\ &= (40 \times 5) + (8 \times 5) \times 100 \\ &= (200 + 40) \times 100 \\ &= 240 \times 100 \\ &= 24,000 \end{aligned}$$

The car will cost her about \$24,000.



Tickets to a baseball game are \$23 for an adult and \$12 for a student. If 37 adult tickets and 325 student tickets were bought, about how much money would it cost for everyone to attend the baseball game?

$$\$23 \times 37 \text{ adults} \approx \$20 \times 40 = \$800$$

$$\$12 \times 325 \text{ children} \approx \$10 \times 300 = \$3,000 \quad \text{OR}$$

$$\$800 + \$3,000 = \$3,800$$

$$\begin{aligned} & \$12 \times 300 \\ & \downarrow \\ &= 12 \times (3 \times 100) \\ &= (12 \times 3) \times 100 \\ &= 36 \times 100 \\ &= 3,600 \end{aligned}$$

$$\$800 + \$3,600 = \$4,200$$

It will cost about \$3,800 for everyone to attend the game. Or It will cost about \$4,200 for everyone to attend the game.