



MATH NEWS

Grade 5 | Module 2 | Topic A | Mental Strategies for 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 discuss Module 2, Topic A.

Objectives

- Multiply multi-digit whole numbers and multiplies 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

Online Practice

Check out www.zearn.com for extra practice as well!

Important Information

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 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:** $43 \times 6 = (40 \times 6) + (3 \times 6)$

- \approx Symbol for meaning 'about'

- When multiplying whole numbers by multiples of 10 you **cannot always count zeros in the factors** and end up with the correct product.

$$5,000 \times 60 \neq 3,000$$

$$(3 \text{ zeros}) \quad (1 \text{ zero}) \quad (4 \text{ zeros})$$

$$5,0000 \times 60$$

$$= 5 \times 1,000 \times 6 \times 10$$

$$= (5 \times 6) \times (1,000 \times 10)$$

$$= 30 \times 10,000 = 300,000$$

Homework Help and Flipped Learning:

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?

Focus Area: Topic A

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

Application Problems and Answers

Find the **product**. Show your thinking.

$$6 \times 70$$

$$\begin{aligned} &= 6 \times 7 \times 10 \\ &= 42 \times 10 \\ &= 420 \end{aligned}$$

$$80 \times 50$$

$$\begin{aligned} &= (8 \times 10) \times (5 \times 10) \\ &= (8 \times 5) \times (10 \times 10) \\ &= 40 \times 100 \\ &= 4,000 \end{aligned}$$

Associative Property

$$524 \times 3$$

$$\begin{aligned} &= (500 \times 3) + (40 \times 3) + (2 \times 3) \\ &= 1,500 + 120 + 6 \\ &= 1,626 \end{aligned}$$

Distributive Property

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

$$\begin{aligned} 867 \times 46 &\approx 900 \times 50 \\ &= 45,000 \end{aligned}$$

$$\begin{aligned} 7,231 \times 25 &\approx 7,000 \times 30 \\ &= 210,000 \end{aligned}$$

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**.

These **equations** are TRUE:

$$\begin{aligned} 850 \times 6 \times 10 &= 85 \times 6 \times 100 \\ (85 \times 10) \times 6 \times 10 &= 85 \times 6 \times (10 \times 10) \\ 85 \times 6 \times 10 \times 10 &= 85 \times 6 \times 10 \times 10 \end{aligned}$$

These **equations** are FALSE:

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

Example Problems and Answers

Problem: Laura wants to buy a new car. If the car payment is \$367 for five years, about how much will the car cost after the five years?

$$\begin{aligned} \$367 \text{ is about } \$400 &\quad \& 12 \text{ months in a year} \\ &\$400 \times 12 \\ &= (4 \times 100) \times 12 \\ &= (4 \times 12) \times 100 \\ &= 48 \times 100 \\ &= 4,800 \end{aligned}$$

$$\begin{aligned} \text{For 5 years -- } \$4,800 \times 5 \\ &= (48 \times 100) \times 5 \\ &= 48 \times 5 \times 100 \\ &= (40 \times 5) + (8 \times 5) \times 100 \\ &= (200 + 40) \times 100 \\ &= 240 \times 100 \\ &= 24,000 \end{aligned}$$

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

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

$$\begin{aligned} \$23 \times 37 \text{ adults} &\approx \$20 \times 40 &= \$ 800 \\ \$12 \times 325 \text{ children} &\approx \$10 \times 300 &= + \$3,000 \\ &&\hline &&\$3,800 \end{aligned}$$

OR

$$\begin{aligned} \$23 \times 37 \text{ adults} &\approx \$20 \times 40 \\ \$12 \times 325 \text{ children} &\approx \$12 \times 300 \\ &\downarrow \\ &= 12 \times (3 \times 100) \\ &= (12 \times 3) \times 100 \\ &= 36 \times 100 \\ &= 3,600 \\ &\$ 800 \\ &+ \$3,600 \\ &\hline &\$4,200 \end{aligned}$$

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