



# MATH NEWS



Grade 5, Module 2, Topic G

## 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 discuss Module 2, Topic G.

Topic G. *Partial Quotients and Multi-Digit Decimal Division*

### Words to know

- multiple
- factor
- divisor
- approximate/estimate ( $\approx$ )
- dividend (whole)
- quotient
- round
- decompose

### Things to Remember!!!

- The dividend is referred to as the whole.
- When dividing by a power of 10 (10, 100, 1000) the digits in the whole (dividend), shift to the right. When dividing by 10, the digits shift 1 place to the right. When dividing by 100, the digits shift 2 places to the right and when dividing by 1,000, the digits shift 3 places to the right. *This is how it would look on a place value chart.*

$$36 \xrightarrow{\div 10} 3.6 \xrightarrow{\div 10} .36 \xrightarrow{\div 10} .036$$

tens	ones	.	tenths	hundredths	thousandths
3	6	.			
	3	.	6		
		.	3	6	
		.	0	3	6

## Focus Area– Topic G

Multi-Digit Whole Number and Decimal Fraction Operations

**Divide.** Show division in two steps.

Let's **decompose** 60 with 10 as a **factor**.  
 $10 \times 6 = 60$

$$2.4 \div 60 =$$

$$2.4 \div 10 \div 6$$

$$= (2.4 \div 10) \div 6$$

$$= 0.24 \div 6$$

$$= 0.04$$

**Step 1:**  
Divide 2.4 by 10

**Step 2:**  
Divide 0.24 by 6

Would the **quotient** be affected if we divided by 6 first then by 10?



$$2.4 \div 6 \div 10$$

$$= (2.4 \div 6) \div 10$$

$$= 0.4 \div 10$$

$$= 0.04$$

The **divisor** didn't change so the **quotient** didn't change.



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**Divide.** Show division in two steps.

$0.36 \div 90$	<b>OR</b>	$0.36 \div 90$
$= (0.36 \div 10) \div 9$		$= (0.36 \div 9) \div 10$
$= 0.036 \div 9$		$= 0.04 \div 10$
$= 0.004$		$= 0.004$

$84.2 \div 200$	<b>OR</b>	$84.2 \div 200$
$= (84.2 \div 2) \div 100$		$= (84.2 \div 100) \div 2$
$= 42.1 \div 100$		$= 0.841 \div 2$
$= 0.421$		$= 0.421$

\*\*\*\*\*

**Estimate the quotients.**

- $4.23 \div 62 \longleftrightarrow 62 \text{ rounds to } 60.$   
 $\approx 4.2 \div 60$   
 $= (4.2 \div 10) \div 6$   
 $= 0.42 \div 6$   
 $= 0.07$   
*4.2 is a divisible by 6, so, the **dividend** becomes 4.2.*
- $53.9 \div 91 \longleftrightarrow 91 \text{ rounds to } 90.$   
 $\approx 54 \div 90$   
 $= (54 \div 9) \div 10$   
 $= 6 \div 10$   
 $= 0.6$   
*53 is not a **multiple** of 9, but 54 is and it close to 53, so, the **dividend** becomes 54.*

## OBJECTIVES OF TOPIC G

- Divide decimal dividends by multiples of 10, reasoning about the placement of the decimal point and making connections to a written method.
- Use basic facts to approximate decimal quotients with two-digit divisors, reasoning about the placement of the decimal point.
- Divide decimal dividends by two-digit divisors, estimating quotients, reasoning about the placement of the decimal point, and making connections to a written method.

At times you may have to extend the dividend to tenths and hundredths.

**The weight of 35 identical toy cars is 844.2 grams. What is the weight of each toy car?**

Strategy:  $844.2 \div 35$

- Can we make a group of 35 with 8 hundreds? (No)
- Since there are 10 tens in 1 hundred, **decompose** 8 hundreds to 80 tens. There are already 4 tens, so there is a total of 84 tens. Can we make a group of 35 with 84 tens? (Yes)  
First division step  $\rightarrow 84 \text{ tens} \div 35$   
Estimate  $\approx 80 \text{ tens} \div 40$   
 $= 2 \text{ tens or } 20$  (2 is placed in the tens place of the **quotient**.)

$$\begin{array}{r} 2 \\ 35 \overline{) 844.2} \\ \underline{70} \\ 14 \end{array}$$

- After subtracting, there are 14 tens left. Can we make a group of 35 with 14 tens? (No)  
Since there are 10 ones in 1 ten, we **decompose** 14 tens to 140 ones. There are already 4 ones, so there is a total of 144 ones. Can we make a group of 35 with 144 ones? (Yes)  
Next division step  $\rightarrow 144 \text{ ones} \div 35$   
 $\approx 120 \text{ ones} \div 40$   
 $= 3$  (3 is placed in the ones place.)

$$\begin{array}{r} 23 \\ 35 \overline{) 844.2} \\ \underline{70} \\ 144 \\ \underline{105} \\ 39 \end{array} \qquad \begin{array}{r} 24 \\ 35 \overline{) 844.2} \\ \underline{70} \\ 144 \\ \underline{140} \\ 4 \end{array}$$

(We can get another group of 35 with 39; so we can get 4 groups of 35 instead of 3 groups in 144 ones.)

- After subtracting, there are 4 ones left. Can we make a group of 35 with 4 ones? (No)  
Since there are 10 tenths in 1 one, we **decompose** 4 ones to 40 tenths. There are already 2 tenths, so there is a total of 42 tenths. Can we make a group of 35 with 42 tenths? (Yes)  
Next division step  $\rightarrow 42 \text{ tenths} \div 35$   
 $\approx 40 \text{ tenths} \div 40$   
 $= 1 \text{ tenth}$  (1 is placed in the tenths place.)

$$\begin{array}{r} 24.1 \\ 35 \overline{) 844.2} \\ \underline{70} \\ 144 \\ \underline{140} \\ 42 \\ \underline{35} \\ 7 \end{array}$$

- After subtracting, there are 7 tenths left. Can we make a group of 35 with 7 tenths? (No)  
Since there are 10 hundredths in 1 tenth, we **decompose** 7 tenths to 70 hundredths. A zero is added to dividend to show hundredths.  
Next division step  $\rightarrow 70 \text{ hundredths} \div 35$   
 $\approx 80 \text{ hundredths} \div 40$   
 $= 2 \text{ hundredths}$  (2 is placed in the hundredths place.)

$$\begin{array}{r} 24.12 \\ 35 \overline{) 844.20} \\ \underline{70} \\ 144 \\ \underline{140} \\ 42 \\ \underline{35} \\ 70 \\ \underline{70} \end{array}$$

- Now check to make certain **quotient** is correct.

$$\begin{array}{r} 24.12 \text{ same as } 2412 \text{ hundredths} \\ \begin{array}{r} \underline{x} \quad 35 \\ 12060 \\ \underline{72360} \\ 84420 \end{array} \text{ hundredths} = 844.20 \end{array}$$

**Each toy car weighs 24.12 grams.**

**A member of the cross country track team ran a total of 300.9 miles in practice over 59 days. If the member ran the same number of miles each day, how many miles did the member run per day?**

Strategy:  $300.9 \div 59$

- Can we make a group of 59 with 3 hundreds? (No)
- There are 10 tens in 1 hundred, so **decompose** 3 hundreds to 30 tens.  
Can we make a group of 59 with 30 tens? (No)
- There are 10 ones in 1 ten, so **decompose** 30 tens to 300 ones. Can we make a group of 59 with 300 ones? (Yes)  
First division step  $\rightarrow 300 \text{ ones} \div 59$   
 $\approx 300 \text{ ones} \div 60$   
 $= 5$  (5 is placed in the ones place.)

$$\begin{array}{r} 5 \\ 59 \overline{) 300.9} \\ \underline{295} \\ 5 \end{array}$$

- After subtracting, there are 5 ones left. Can we make a group of 59 with 5 ones? (No)
- There are 10 tenths in 1 one, so **decompose** 5 ones to 50 tenths. There are already 9 tenths, so there is a total of 59 tenths. Can we make a group of 59 with 59 tenths? (Yes)  
Next division step  $\rightarrow 59 \text{ tenths} \div 59$   
 $= 1 \text{ tenth}$  (1 is placed in the tenths place.)

$$\begin{array}{r} 5.1 \\ 59 \overline{) 300.9} \\ \underline{295} \\ 59 \\ \underline{59} \end{array}$$

Check:

$$\begin{array}{r} 5.1 \text{ same as } 51 \text{ tenths} \\ \underline{x} \quad 59 \\ 459 \\ \underline{2550} \\ 3009 \end{array}$$

3009 tenths = 300.9

**The member ran 5.1 miles each day.**