MATH NEWS

Grade 5, Module 2, Topic G

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 G.

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

Words to know

- multiple
- factor
- divisor
- approximate/estimate (≈)
- 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

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.

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 x 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 ÷ 90
= (0.36 ÷ 10) ÷ 9
= 0.036 ÷ 9
= 0.004

OR

0.36 ÷ 90
= (0.36 ÷ 9) ÷ 10
= 0.04 ÷ 10
= 0.004

84.2 ÷ 200
= (84.2 ÷ 2) ÷ 100
= 42.1 ÷ 100
= 0.421

OR

84.2 ÷ 200
= (84.2 ÷ 100) ÷ 2
= 0.841 ÷ 2
= 0.421

****

Estimate the **quotients.**

1. 4.23 ÷ 62
≈ 4.2 ÷ 60
= (4.2 ÷ 10) ÷ 6
= 0.42 ÷ 6
= 0.07

*62 **rounds** to 60. 4.2 is a divisible by 6, so, the **dividend** becomes 4.2.*

2. 53.9 ÷ 91
≈ 54 ÷ 90
= (54 ÷ 9) ÷10
= 6 ÷ 10
= 0.6

*91 **rounds** to 90. 53 is not a **multiple** of 9, but 54 is and it close to 53. so, the **dividend** becomes 54.*

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 ÷ 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 → 84 tens ÷ 35
  Estimate ≈ 80 tens ÷ 40
  = 2 tens or 20 (2 is placed in the tens place of the **quotient**.)

```
    2
35|844.2
  70
  14
```

- 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 → 144 ones ÷ 35
  ≈ 120 ones ÷ 40
  = 3 (3 is placed in the ones place.)

```
    23
35|844.2
  70
  144
  105
   39
```

```
    24
35|844.2
  70
  144
  140
    4
```

(**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 → 42 tenths ÷ 35
  ≈ 40 tenths ÷ 40
  = 1 tenth (1 is placed in the tenths place.)

```
    24.1
35|844.2
  70
  144
  140
    42
    35
     7
```

- 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 → 70 hundredths ÷ 35
  ≈80 hundredths ÷ 40
  = 2 hundredths (2 is placed in the hundredths place.)

```
    24.12
35|844.20
  70
  144
  140
    42
    35
     70
     70
```

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

```
24.12   same as   2412 hundredths
x  35             x 35
                 12060
                 72360
                 84420 hundredths = 844.20
```

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 ÷ 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 → 300 ones ÷ 59
  ≈ 300 ones ÷ 60
  = 5 (5 is placed in the ones place.)

```
    5
59|300.9
  295
    5
```

- 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 → 59 tenths ÷ 59
  = 1 tenth (1 is placed in the tenths place.)

```
    5.1
59|300.9
  295
   59
   59
```

Check:

```
5.1   same as   51 tenths
x 59            x 59
                459
               2550
               3009 tenths = 300.9
```

The member ran 5.1 miles each day.