MATH NEWS

Grade 5, Module 2, Topic B

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 B.

Topic B. The Standard Algorithm for Multi-Digit Whole Number Multiplication

Words to Know

- Area Model
- Standard Algorithm
- Numerical Expression
- Estimate
- Product
- Factor
- Decompose

Things to Remember!!!

- **Standard Algorithm**
  Step-by-step procedure to solve a problem
- **Numerical Expression**
  A mathematical phrase involving only numbers and one or more operational symbol **Example: 11 x (6+13)**
- Symbol for **'about'** ≈
- **Product**

The answer when two or more numbers are multiplied together.

7 x 3 = 21
Factor Factor Product

Objectives of Topic B

- Connect visual models and the distributive property to partial products of the standard algorithm without renaming.
- Fluently multiply multi-digit whole numbers using the standard algorithm to solve multi-step word problems.
- Connect area diagrams and the distributive property to partial products of the standard algorithm with and without renaming.
- Fluently multiply multi-digit whole numbers using the standard algorithm to solve multi-step word problems and using estimation to check for reasonableness of the product.

Focus Area– Topic B

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

Problem 1: 432 x 24

Draw using **area model** and then solve using the **standard algorithm**. Use arrows to match the partial products from the **area model** to the partial products of the **algorithm**.

To find the answer to this problem, first we represent units of 432.
Decompose 432 to make finding the partial product easier.
400 + 30 + 2

How many four hundred thirty-twos are we counting? (24)
Decompose 24 (20 + 4)

Multiply:
What is the **product** of 4 and 2? 8
What is the **product** of 4 and 30? 120
Continue recording the **product** in the **area model**.
Now add each row of partial products.
Solve using the **standard algorithm**. Compare the partial products in the **area model** to the partial products in the algorithm.

	400 +	30 +	2	
4 +	1600	120	8	=1,728
20	8000	600	40	=8,640

```
     1
   4 3 2
 x   2 4
   1
  1 7 2 8
 +8 6 4 0
 1 0,3 6 8
```

What are 24 groups of 432? 10,368

Problem 2: 532 x 283

Estimate the **product**. Solve using **standard algorithm**. Use your **estimate** to check the reasonableness of the **product**.
To **estimate** the product round each **factor**.
532 → closer to 5 hundreds than 6 hundreds on the number line
283 → closer to 3 hundreds than 2 hundreds on the number line
Multiply the rounded **factors** to **estimate** the **product**.

Multiply the rounded **factors** to **estimate** the **product**.

532 x 283
≈ 500 x 300
= 150,000

```
      5 3 2
    x 2 8 3
    1 1
    1 1 5 9 6
    4 2 5 6 0
 +1 0 6 4 0 0
  1 5 0,5 5 6
```

Problems and Answers

The Grand Theatre purchased 257 new theatre seats for their auditorium at $129 each. What's the total cost of the new theatre seats?

To find the answer to this problem, first we draw an **area model**. We represent the number of seats in the **area model** by **decomposing** 257 to make finding the partial product easier. Next, **decompose** 129 which is the cost of each seat. Record the **products**.

	200 +	50 +	7	
9 +	1,800	450	63	= 2,313
20 +	4,000	1,000	140	= 5,140
100	20,000	5,000	700	= 25,700

```
    2 5 7
  x 1 2 9
   1
    2 3 1 3
  1 5 1 4 0
 +2 5 7 0 0
  3 3,1 5 3
```

The total cost of the theatre seats is <u>$33,153.</u>

Peter has collected 15 boxes of football cards. Each box has 312 cards in it. Peter estimates he has about 6,000 cards, so he buys 10 albums that hold 600 cards each.

A. Did Peter purchase too many, not enough, or just the right amount of albums to hold his football cards? Explain your answer?

Step 1: To solve this problem, first **estimate** the number of cards in each box. 312 closer to 300 than 400

Multiply the number of boxes times **estimated** number of cards in each box.

312 x 15
≈ 300 x 15
= (3 x 100) x 15
= (3 x 15) x 100
= 45 x 100
= 4500 Peter has about 4,500 cards.

Note: *You may round 15 to 20 and then multiply 300 x 20 which equals 6,000. Therefore you could say that Peter has about 6,000 cards. Since both factors were rounded up, the actual number of cards is less than 6,000.*

Step 2: Find the total number of cards the 10 albums hold altogether.

600 x 10 = 6,000 The 10 albums can hold 6,000 cards.

Step 3: Peter purchased too many albums to hold his football cards. He has about 4,500 cards and ten albums would hold 6,000 cards. (Explanation could be justified by statement written in the note above.)

B. How many cards does Peter have? Use the standard algorithm to solve the problem.

```
    3 1 2
   x  1 5
  1 5 6 0
 + 3 1 2 0
  4,6 8 0
```

Peter has a total of 4,680 cards.

C. How many albums will he need for all his cards?

1 album 600 cards	2 albums 1,200 cards	3 albums 1,800 cards	4 albums 2,400 cards	5 albums 3,000 cards	6 albums 3,600 cards	7 albums 4,200 cards	8 albums 4,800 cards

Peter will need 8 albums for all his cards.