Oak Park Elementary School District 97

MATH NEWS

Grade 5 | Module 2 | Topic B | Whole Number and Decimal Fraction Operations

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 focus on The Standard Algorithm for Multi-Digit Whole Number and Decimal Fraction Operations.

Objectives

- 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 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

Important Information

Words to Know:

- Area Model
- Standard Algorithm
- Numerical Expressions
- 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 meaning 'about'
- **Product:** The answer when two or more numbers are multiplied together

7 x 3 = 21

factor factor product

Example Problems

Problem 1: 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

283 ⟶ closer to 3 hundreds than 2 hundreds

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

532 x 283

≈ 500 x 300

= 150,000

```
      532
  x   283
      1 1
    1 1596
     43560
 +  106400
   150,000
```

Example Problems (cont.)

Problem 2: 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
    432
x    24
     1
   1728
+  8640
 10,368
```

What are 24 groups of 432?

10,368

Application Problems and Answers

Problem: 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**.

Problem continued in next column

Application Problems and Answers (cont.)

	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

```
     257
x    129
     1
    2313
   1 5140
+  25700
  33,153
```

The total cost of the seats is $33,153.

Problem: 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*) 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
= 4,500

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).

Application Problems and Answers (cont.)

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

$$\begin{array}{r} 312 \\ \times \quad 15 \\ \hline 1560 \\ +\ 3120 \\ \hline 4{,}680 \end{array}$$

Peter has a total of 4,680 cards.

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

Number of Albums	Number of 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.

Homework Help

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?d=x&piid=&vpid=1401784829350

Online Resources

Flipped learning is a great way to review topics that your student is learning in the classroom. The following are links to videos that give detailed explanations for each lesson in this topic.

Lesson 3: https://www.youtube.com/watch?v=EJoMoKq_Tak

Lesson 4: https://www.youtube.com/watch?v=z0Vzo1PR7qg

Lesson 5: https://www.youtube.com/watch?v=0QIzKOqDiu0

Lesson 6: https://www.youtube.com/watch?v=bHwxH617pKs

Lesson 7: https://www.youtube.com/watch?v=WV2nG2VFNQ8

Lesson 8: https://www.youtube.com/watch?v=VoolKDEDg1Y

Lesson 9: https://www.youtube.com/watch?v=bjYzVtjFQzE