Exploring the Distributive Property

Printable Pre-Algebra/Algebra Lesson from Bethany @ Math Geek Mama

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lesson!



The **Problem:** Mrs. Jones is going shopping for her twins' birthday! She can spend any amount of money, but whatever is bought for one MUST be bought for the other as well.

Help Mrs. Jones decide on her gifts, and figure out the total cost.

## Step 1:

Ghoose 3 gifts for Mrs. Jones to buy for her twins, and the price of each item.

Gift Item:	Price (for one)

## Step 2:

Using hands on manipulatives, by drawing a picture or table, or by explaining in words, determine the TOTAL cost of the 3 gifts for her two children.



The **Problem**: Mrs. Smith is going shopping for her triplets' birthday! She can spend any amount of money, but whatever is bought for one MUST be bought for all three kids.

Help Mrs. Smith decide on her gifts, and figure out the total cost.

## Step 1:

Ghoose 3 gifts for Mrs. Smith to buy for her triplets, and the price of each item.

Gift Item:	Price (for one)

### Step 2:

Using hands on manipulatives, by drawing a picture or table, or by explaining in words, determine the TOTAL cost of the 3 gifts for her three children.





- Gan you write a mathematical statement or expression to represent how you calculated to cost for Mrs. Jones?
- Gan you write a mathematical statement or expression to represent how you calculated to cost for Mrs. Smith?
- What was the difference in how you calculated Mrs. Jones' total cost and how you calculated Mrs. Smith's total cost?
- You have been using what is known in math as the **Distributive Property**. To solve, you either doubled each item or tripled each item. When a number is written outside a parenthesis, it means you multiply **EVERY item** inside by that number. Try to solve the following problems in a similar way to how you found the total cost of the birthday presents.

**1.** 4 (12 + 3 + 9) =

**2.** 2 ( 5 + x ) =

3. 2.5 (17 - 8 + 12) =

**4.** -6 ( 4 + 8x ) =

• How did you solve the problems with variables and not just numbers? (HINT: You will still have variables in your answer).

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Answer Key

- Can you write a mathematical statement or expression to represent how you calculated to cost for Mrs. Jones? This will look slightly different for each student depending on what prices they used, but it should be the price of each object multiplied by 2, i.e.  $2a + 2b + 2c \ OR \ 2 \ (a+b+c)$ .
- Gan you write a mathematical statement or expression to represent how you calculated to cost for Mrs. Smith? Again, this will look slightly different for each student depending on what prices they used, but it should be the price of each object multiplied by 3, i.e. 3a + 3b + 3c OR 3 (a+b+c).
- What was the difference in how you calculated Mrs. Jones' total cost and how you calculated Mrs. Smith's total cost? For Mrs. Jones, the cost of each present is multiplied by 2 (for the 2 kids) whereas for Mrs. Smith, the cost of each present was multiplied by 3 (3 kids).
- You have been using what is known in math as the **Distributive Property**. To solve, you either doubled each item or tripled each item. When a number is written outside a parenthesis, it means you multiply **EYERY item** inside by that number. Try to solve the following problems in a similar way to how you found the total cost of the birthday presents.

**1.** 4 (12 + 3 + 9) =

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**2.** 2 ( 5 + x ) =

4(12) + 4(3) + 4(9) = 96

2(5) + 2(x) = 10 + 2x

**3.** 2.5 (17 – 8 + 12) =

**4.** -6 ( 4 + 8x ) =

#### 2.5 (17) - 2.5 (8) + 2.5 (12) = 52.5

-6(4) + -6(8x) = -24 - 48x

 How did you solve the problems with variables and not just numbers? (HINT: You will still have variables in your answer). Answers will vary, but should be something like: Multiply each constant and each coefficient, but leave them as separate terms because they are not like terms.

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