Multiplication Notes from the Classroom

Use the multiplication algorithm (algorithm = steps in a process) to solve multiple digit multiplication problems

- Be able to multiple 2 or 3 digit number with 1 digit number – and show your work
  - Example 25 x 4 =

```
 2
 25      4 x 5 = 20 write 0 carry 2
 x4      4 x 2 = 8 + 2 = 10  no other number in
100      factor to multiple so write 10
```

  - Example 346 x 6 =

```
 23
 346     6 x 6 = 36      write 6 carry 3
 x  6    6 x 4 = 24 + 3 = 27    write 7 carry 2
2076     6 x 3 = 18 + 2 = 20  no other number
         in factor to multiple so write 20
```

- Be able to multiple 2 or 3 digit number with 2 digit number – and show your work
  - Example 236 x 26 =

```
  1
 23
 236     6 x 6 = 36      write 6 carry 3
 x 26    6 x 3 = 18 + 3 = 21    write 1 carry 2
 1416    6 x 2 = 12 + 2 = 14  no other number +
+4720    in factor to multiple so write 20
 6136    Write in zero place holder
         Because the problem is really 236 x 20
         2 x 6 = 12      write 2 carry 1
         2 x 3 = 6 + 1 = 7
         2 x 2 = 4   no other number in factor
         to multiple so write 4
         Then add
```

Estimate the product (First Round, then multiple)

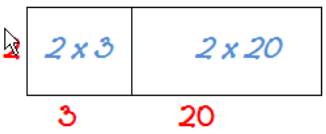
- Example: $535 x 7 = _____ 535 → 500
  - 500 x 7 = → 5 x 7 = 35 then add the zeros 500 x 7 = 3500

Model a multiplication problem

- (several ways, but one way students must know is the area model (distributive method)

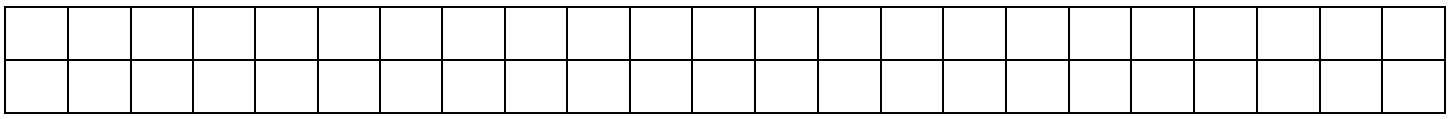
Model 23 x 2

(area model)



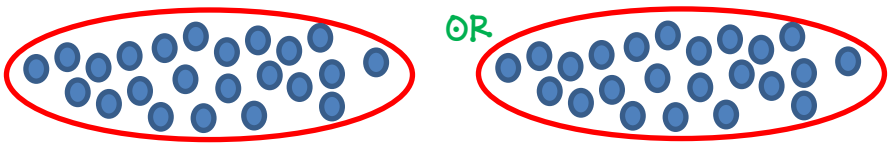
(distributive method or an area model)

OR



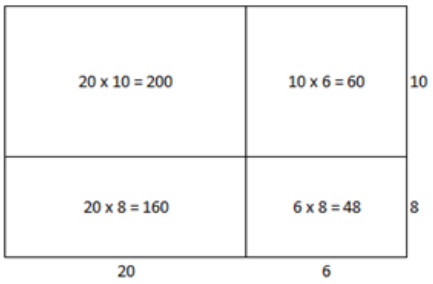
OR

XXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXX



OR

Model 26 x 18



200
60
160
+ 48
468

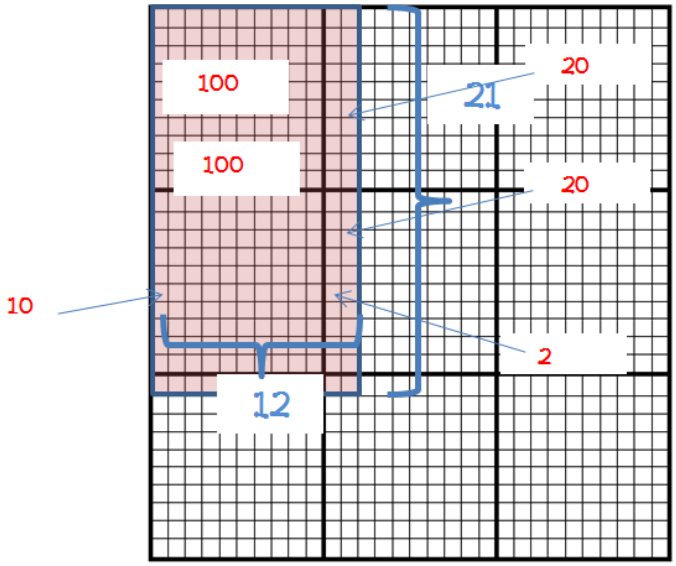
(area model)

26 x 18 = 468

Using Base 10 Grid Paper to draw a model. Note: this is the same as an area model, we are simply drawing it on grid paper with the little squares *Model 12 x 21*

12 X 21 =_____

100 + 100 + 10 + 2 + 20 + 20
= 252



<u>The 5 multiplication properties</u>

- Zero Property of Multiplication 0 x n = 0 ex.: 0 x 5 = 0
  - Product of any number multiplied with zero will be zero
- Identify Property or Property of One 1 x n = n ex.: 1 x 5 = 5
  - Product of any number multiplied with one will be that number
- Commutative Property - any order n x m = m x n ex.: 5 x 4 = 4 x 5
  - The product will be the same regardless of the order you multiple the factors
- Associative Property – any grouping (n x m) x p = (p x m) x n ex.: (3 x 4) x 5 = (5 x 4) x 3
  - The product will be the same regardless of how you group the factors to multiply
- Distributive Property - split up one of the factors
  - (n x m) = (n x r) + (n x s) *where r + s = m*
    ex.: (4x 23) = (4 x 20) + (4 x 3) → 20 + 3 = 23
    = 92 = 80 + 12 = 92

<u>Using the above properties to solve equations easily</u>

- Ex: 5 x _____ = 1 x 5 *uses identity property therefore the answer is 1*

- Ex: 4 x _____ = 3 x 4 *uses commutative property therefore the answer is 3*
- Ex: (4 x 5) x 6 = (6 x 4) x _____ *uses associative property therefore the answer is 5*

Multiplication Part II Study Guide

- Be able to identify the Multiplication properties
- Be able to use the Multiplication properties to solve equations easily
- Be able to multiple 2 or 3 digit number with 1 digit number
- Be able to multiple 2 or 3 digit number with 2 digit number
- Be able to estimate the product
- Be able to write an expression or equation using variables that represents a word problem
- Be able to model and identify models that represent multiplication
- Be able to model and identify models that represent the properties of multiplication
- Be able to solve word problems involving multiplication, subtraction, and addition
- Be able to solve inequalities of multiplication

Review

- Be able to add and subtract large numbers
- Know your math facts
- Be able to identify large numbers by their place value
- Know the three forms of a number – standard, word, and expanded