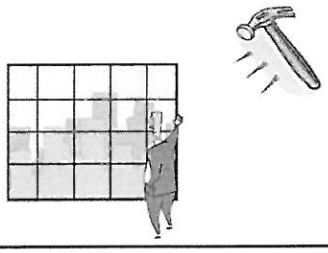
1)

Decomposing Model a.k.a. "The Area Model"

A whole new way to multiply!



2)

So what's it all about?

- *Like the Break Apart model*, take a large number and decompose it into smaller numbers
- Use those smaller numbers to create "smaller" more manageable problems
- Be quicker and more accurate with finding your product
- We will use PLACE VALUE, (the actual value of digits)

Step One:

3)

Here's what to do!

- Decompose or "break apart" the two numbers in the multiplication problem

  12 x 18
  - break 12 → (1 ten and 2 ones) 10 + 2
  - break 18 → (1 ten and 8 ones) 10 + 8

Step Two:

4)

Setting it up...

- Now set up the "Area Model"

	10	8
10		
2		

What do you notice about the sizes of these boxes? How are they different?

- Label each part of the decomposed numbers outside the "figure"

Step Three:

5) **Then the multiplication begins!**

- Multiply each outside dimension to solve each "part" within the area...

	10	8
10	**100** (10 x 10) = 100	**80** (10 x 8) = 80
2	**20** (2 x 10) = 20	**16** (2 x 8) = 16

Step Four:

6) **And the next step...**

- Add the products from each box...

	10	8
10	100	80
2	20	16

- 12 x 18 = (10 x 10) + (10 x 8) + (2 x 10) + (2 x 8)
- 12 x 18 = 100 + 80 + 20 + 16
- 12 x 18 = 180 + 36
- 12 x 18 = **216**

Step Five:

7) **Write it all out...**

- Here's what the complete math looks like:

12 x 18= (10 + 2) x (10 + 8)
12 x 18= (10 x 10) + (10 x 8) + (2 x 10) + (2 x 8)
12 x 18= 100 + 80 + 20 + 16
12 x 18= **216**

8) **Now let's try another!**

- Can you solve 15 x 23?
- Make your "figure"...

	20	3
10		
5		