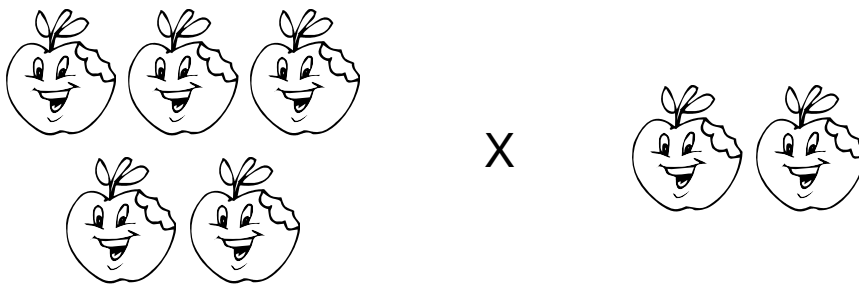


**Properties of Operations as Strategies - Step-by-Step Lesson****Lesson 1 Properties of operations:**

$$2 \times 5 = 2 \times 5$$

What property of multiplication is displayed above?

- a) commutative                      b) zero property  
c) associative                        d) distributive

**Explanation:**

Lets review the properties of multiplication-

**Commutative Property** - When you multiply two numbers their product is always the same. It doesn't matter what order you multiply them in. Take a quick look:

$4 \times 8$  is the 32. So is  $8 \times 4$ .

$12 \times 3$  is the same as  $3 \times 12$ . The product is 36. Get the idea?

**Associative Property** – The associative property is very similar to the commutative property, but just involves more numbers; three or more numbers to be exact. When you multiply three or more the product is the same. Again order or grouping of the numbers does not matter. Let's take a look:

$4 \times 8 \times 5 \times 10$  has the same product as  $5 \times 8 \times 10 \times 4$ . The final product is 1600 regardless of how you order those 4 numbers in the problem.



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**Distributive Property** – This is a very useful property that will save you time in the future. The basic idea is that multiplying two numbers by the same number and adding their sum; gives you the same answer as adding the numbers and then multiplying by that same number. Here is an example.

$5 \times 8 + 5 \times 9$  gives you the same product as  $5 (8 + 9)$ .

**Zero Property** – You were taught this on the first day you learned anything about multiplication. When you multiply anything by 0, your answer is always 0.

**Identity Property** – And now, last but not least, the other thing you learned the first day you met up with multiplication; We you multiply any number by 1 the product is the number itself.

Now let's see how these properties relate to the problem. We could do this:

$$\begin{array}{c} \text{Tomato} \quad \text{Tomato} \quad \text{Tomato} \\ \text{Tomato} \quad \text{Tomato} \end{array} \times \begin{array}{c} \text{Tomato} \quad \text{Tomato} \end{array} = 10$$

$$\begin{array}{c} \text{Tomato} \quad \text{Tomato} \\ \text{Tomato} \quad \text{Tomato} \quad \text{Tomato} \end{array} \times \begin{array}{c} \text{Tomato} \quad \text{Tomato} \end{array} = 10$$

The example given above will yield the same answer when the left and right side of the equation are multiplied.

This is the commutative property of multiplication. So the answer is a).

