

Exploring Multiplication Using the Distributive Property



Here's a fun way to think about multiplication.
Take a look at this problem:

2 kids each had 12 cars. How many cars were there total?
 $2 \times 12 = ?$

If you didn't know your "time twelves" you can solve this using multiples of ten (easy to work with) and the Distributive Property:

$$2 \times 12 = (2 \times 10) + (2 \times 2) = 20 + 4 = 24$$

Try this problem using the Distributive Property and multiples of 10:

4 kids bring 24 cars to share and trade. How many cars are there?
 $4 \times 24 = ?$

$$4 \times 24 = (\underline{\quad} \times 20) + (\underline{\quad} \times 4) = 80 + 16 = 96 \text{ cars}$$

Now let's try these using the distributive property. Show your work:

$$\begin{array}{r} \text{Kids} \times \text{Cars} = \text{Total Cars} \\ 3 \quad \times \quad 99 = \underline{\hspace{2cm}} \end{array}$$

$$6 \quad \times \quad 51 = \underline{\hspace{2cm}}$$

$$5 \quad \times \quad 95 = \underline{\hspace{2cm}}$$

$$3 \quad \times \quad 76 = \underline{\hspace{2cm}}$$

On the back tell why this method is fast (or slow) and easy (or hard)
(Scroll down for answers)

Answers:

$$3 \times 99 = (3 \times 90) + (3 \times 9) = 270 + 27 = 297 \text{ cars}$$

$$6 \times 51 = (6 \times 50) + (6 \times 1) = 300 + 6 = 306 \text{ cars}$$

$$5 \times 95 = (5 \times 90) + (5 \times 5) = 450 + 25 = 475 \text{ cars}$$

$$3 \times 76 = (3 \times 70) + (3 \times 6) = 210 + 18 = 228 \text{ cars}$$

Here's a way to use this knowledge in an Algorithm
The Partial Products Algorithm:

$$24 \times 4 = ?$$

$$\begin{array}{r} 24 \\ \times 4 \\ \hline 16 \quad (4 \times 4) \\ 80 \quad (4 \times 20) \\ \hline 96 \end{array}$$

To solve ANY multiplication problem all you need to know is your basic facts and this technique. This is how Multiplication works!