Name:_____ Date:_____

Multiplication Algorithm

While effective, the partial product table method is very tedious. However, using the logic of that method allows us to find a faster way of multiplication. Let's see what the process was using the partial products table and try to find a simpler method:

Partial Product Steps:

1) Compute the partial products by expanding each number and multiplying each place value.
2) Add them.

Ex.

54 × 37 = ?

×	50	4
30	1500	120
7	350	28

54
× 37
28
350
120
+ 1500
1998

What if we condensed our partial products into 54 × 7 = 7 x 54 + 30 x 54?

We know that products involving multiples of tens will always end in a certain number of 0's. Instead of writing each product involving a multiple of ten under the factors,we can indicate this using a superscript above the factors.

	Step 1: 4×7	Step 2: 50×7	Totalling	Final
2				2
54	# 1's: 8	# 1's: 0	total # 1's: 8	54
x 7	# 10's: 2	# 10's: 5	total # 10's: 7	x 7
---	# 100's: 0	# 100's: 3	total # 100's: 3	----
8				378

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The general method

1. Multiply each digit of the 2nd (bottom) factor by the 1st (top) factor, starting with the rightmost digit of the top number and moving left.
2. Carry over the 10s digit of the temporary product until you finish with that place value
3. Move on to a new line every time you finish with a digit on the bottom number, taking care to have the correct number of 0's
4. Add the resulting lines.

Try it!

$$\begin{array}{r} 15 \\ \times\ 34 \\ \hline \end{array} \qquad \begin{array}{r} 72 \\ \times\ 51 \\ \hline \end{array}$$

$$\begin{array}{r} 419 \\ \times\ 76 \\ \hline \end{array} \qquad \begin{array}{r} 48 \\ \times\ 53 \\ \hline \end{array}$$