

## MULTIPLYING LARGE NUMBERS

**FACT 1:** Arrange the digits of the numbers in columns by their place values and then multiply using the distribution property.

Multiply 547 by 213

(a) There are as many partial products as there are digits in the multiplier.

(b) Write the partial products, from right to left, starting from the column of the digit of the multiplier.

(c) Omit trailing zeroes of the partial product.

Do this multiplication on paper and then check out the product **116,511** on a calculator.

$$\begin{array}{r}
 5 \ 4 \ 7 \\
 \times 2 \ 1 \ 3 \\
 \hline
 1 \ 6 \ 4 \ 1 \\
 5 \ 4 \ 7 \\
 \hline
 1 \ 0 \ 9 \ 4 \\
 \hline
 1 \ 1 \ 6 \ 5 \ 1 \ 1
 \end{array}$$

Multiply 526 by 602

(a) When there is a '0' digit in the multiplier, its partial product is zero, and it may be omitted.

(b) Keep in mind that the row for the next partial product should line up with the column of the digit in the second factor.

Do this multiplication on paper and then check out the product **316,652** on a calculator.

$$\begin{array}{r}
 5 \ 2 \ 6 \\
 \times 6 \ 0 \ 2 \\
 \hline
 1 \ 0 \ 5 \ 2 \\
 3 \ 1 \ 5 \ 6 \\
 \hline
 3 \ 1 \ 6 \ 6 \ 5 \ 2
 \end{array}$$

**FACT 2:** We may multiply in two different ways with the same factors to verify the product. The product should be the same in both cases.

Multiply 21 by 3005

$$\begin{array}{r}
 & 2 & 1 \\
 \times & 3 & 0 & 0 & 5 \\
 \hline
 & 1 & 0 & 5 \\
 6 & 3 \\
 \hline
 6 & 3 & 1 & 0 & 5
 \end{array}$$

$$\begin{array}{r}
 3 \ 0 \ 0 \ 5 \\
 \times 2 \ 1 \\
 \hline
 3 \ 0 \ 0 \ 5 \\
 6 \ 0 \ 1 \ 0 \\
 \hline
 6 \ 3 \ 1 \ 0 \ 5
 \end{array}$$

1. Multiply the following numbers by columns. Verify your answers on a calculator.

(a) 325 x 221	(f) 1700 x 400	(k) 121 x 989
(b) 496 x 143	(g) 2370 x 2000	(l) 8530 x 778
(c) 333 x 333	(h) 3059 x 206	(m) 249 x 117
(d) 574 x 203	(i) 4444 x 2222	(n) 3000 x 3000
(e) 408 x 307	(j) 5333 x 1071	(o) 2200 x 3030

**End of Lesson**