

Long multiplication

Multiplying a large number by a single-digit number

This isn't as hard as it looks, but you will need to know your times tables up to 10×10 pretty well before you try this.

Write the large number above the small one.

$$\begin{array}{r} \text{HTU} \\ 786 \\ \times 2 \\ \hline \end{array}$$

Multiply the single-digit number on the bottom by the units, then tens, then hundreds of the number at the top.

786 Multiply by units

$$\begin{array}{r} 786 \\ \times 2 \\ \hline 12 \end{array} \rightarrow 6 \times 2 = 12$$

786 Multiply by tens

$$\begin{array}{r} 786 \\ \times 2 \\ \hline 12 \\ 160 \end{array} \rightarrow 80 \times 2 = 160$$

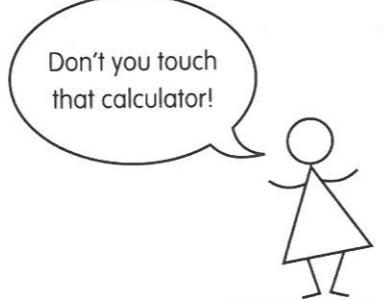
786 Multiply by hundreds

$$\begin{array}{r} 786 \\ \times 2 \\ \hline 12 \\ 160 \\ 1400 \end{array} \rightarrow 700 \times 2 = 1,400$$

Finally, add up the answers to those three multiplications.

$$\begin{array}{r} 12 \\ 160 \\ + 1400 \\ \hline 1572 \end{array}$$

So: $786 \times 2 = 1,572$



Now let's try the fast way

A quicker way of doing this is to write the answer to each multiplication on the same line, going from right to left. If you get an answer of ten or more when you're multiplying the units, tens, or hundreds, you "carry" the first digit of that answer, adding it to the column to the left.

$$\begin{array}{r} 285 \\ \times 3 \\ \hline 5 \end{array} \quad 5 \times 3 = 15$$

Carry 1 to tens column.

$$\begin{array}{r} 285 \\ \times 3 \\ \hline 55 \end{array} \quad \begin{array}{l} 8 \times 3 = 24 \\ 24 + 1 = 25 \end{array}$$

Carry 2 to hundreds column.

$$\begin{array}{r} 285 \\ \times 3 \\ \hline 855 \end{array} \quad \begin{array}{l} 2 \times 3 = 6 \\ 6 + 2 = 8 \end{array}$$

Now have a go

$\begin{array}{r} 385 \\ \times 2 \\ \hline \end{array}$
 $\begin{array}{r} 723 \\ \times 4 \\ \hline \end{array}$
 $\begin{array}{r} 210 \\ \times 3 \\ \hline \end{array}$
 $\begin{array}{r} 974 \\ \times 8 \\ \hline \end{array}$

Multiplying two large numbers together

If you are multiplying together two numbers that have more than one digit, things get a little trickier. Keep practising and you'll soon pick it up.



First concentrate on the unit digit at the bottom, and multiply it by each number on the top row in turn.

HTU
 $\begin{array}{r} 824 \\ \times 36 \\ \hline \end{array}$ Ignore this 3 at first. Multiply 6 by 4, then 2, then 8.

$$\begin{array}{r} 824 \\ \times 36 \\ \hline 4 \end{array} \quad 6 \times 4 = 24 \quad \text{carry the 2}$$

$$\begin{array}{r} 824 \\ \times 36 \\ \hline 44 \end{array} \quad \begin{array}{l} 6 \times 2 = 12 \\ 12 + 2 = 14 \end{array} \quad \text{carry the 1}$$

$$\begin{array}{r} 824 \\ \times 36 \\ \hline 4944 \end{array} \quad 6 \times 8 = 48 \quad 48 + 1 = 49$$

Now look at the tens digit at the bottom, and multiply it by the units, tens and hundreds digits in the top row. But first you need to add a zero, because you're multiplying by numbers in the tens column.

$$\begin{array}{r} 824 \\ \times 36 \\ \hline 4944 \\ 20 \end{array} \quad \begin{array}{l} 3 \times 4 = 12 \\ \text{Add a zero} \\ \text{carry the 1} \end{array}$$

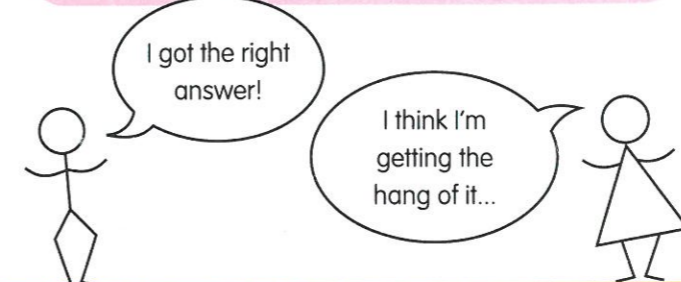
$$\begin{array}{r} 824 \\ \times 36 \\ \hline 4944 \\ 720 \end{array} \quad \begin{array}{l} 3 \times 2 = 6 \\ 6 + 1 = 7 \end{array}$$

$$\begin{array}{r} 824 \\ \times 36 \\ \hline 4944 \\ 24720 \end{array} \quad 3 \times 8 = 24$$

$$\begin{array}{r} 824 \\ \times 36 \\ \hline 4944 \\ + 24720 \\ \hline 29664 \end{array}$$

Finally, add together the two rows of numbers.

The answer is 29,664.



Now have a go

$\begin{array}{r} 285 \\ \times 23 \\ \hline \end{array}$
 $\begin{array}{r} 457 \\ \times 18 \\ \hline \end{array}$
 $\begin{array}{r} 628 \\ \times 71 \\ \hline \end{array}$
 $\begin{array}{r} 767 \\ \times 58 \\ \hline \end{array}$
 $\begin{array}{r} 526 \\ \times 99 \\ \hline \end{array}$
 $\begin{array}{r} 614 \\ \times 63 \\ \hline \end{array}$