

Multiplying in Columns, Standard Way

Here we learn the standard algorithm of multiplication. It is based on the same principle of multiplying in parts: you simply multiply ones and tens separately, and add. In the standard algorithm the *adding* is done at the same time as multiplying. The calculation looks more compact and takes less space.

$$\begin{array}{r} \\ 63 \\ \times 4 \\ \hline \end{array}$$

Multiply the ones first.

$$4 \times 3 = 12$$

Place 2 under the line at the ones place, but the tens digit (1) is written above the tens column as a little memory note. This is called *carrying to tens*.

$$\begin{array}{r} \\ 63 \\ \times 4 \\ \hline 252 \end{array}$$

Then multiply the tens, and *add* the 1 ten that was carried over.

$$4 \times 6 + 1 = 25$$

There is a total of 25 tens, which actually signifies 250. Write the 25 in front of the ones digit (2).

$$\begin{array}{r} 63 \\ \times 4 \\ \hline 12 \\ + 240 \\ \hline 252 \end{array}$$

Compare to the method of “multiplying in parts” that you learned previously, where the adding is done separately.

(In the calculation $4 \times 6 + 1 = 25$, the 6 and the 1 are actually tens. So in reality we calculate $4 \times 60 + 10 = 250$.)

Look at other examples. In each case, some tens are carried as a result of multiplying the ones.

$$\begin{array}{r} \\ 27 \\ \times 4 \\ \hline \end{array} \quad \begin{array}{r} \\ 27 \\ \times 4 \\ \hline 108 \end{array}$$

$4 \times 7 = 28$ $4 \times 2 + 2 = 10$

$$\begin{array}{r} \\ 69 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} \\ 69 \\ \times 7 \\ \hline 483 \end{array}$$

$7 \times 9 = 63$ $7 \times 6 + 6 = 48$

$$\begin{array}{r} \\ 54 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} \\ 54 \\ \times 6 \\ \hline 324 \end{array}$$

$6 \times 4 = 24$ $5 \times 6 + 2 = 32$

$$\begin{array}{r} \\ 83 \\ \times 9 \\ \hline \end{array} \quad \begin{array}{r} \\ 83 \\ \times 9 \\ \hline \end{array}$$

$9 \times 3 =$ $9 \times 8 + 2 =$

$$\begin{array}{r} \\ 77 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} \\ 77 \\ \times 7 \\ \hline \end{array}$$

$7 \times 7 =$

$$\begin{array}{r} \\ 38 \\ \times 5 \\ \hline \end{array} \quad \begin{array}{r} \\ 38 \\ \times 5 \\ \hline \end{array}$$

Compare the earlier method with the one in this lesson:

$$\begin{array}{r}
 75 \\
 \times 8 \\
 \hline
 40 \\
 + 560 \\
 \hline
 600
 \end{array}$$

OR

$$\begin{array}{r}
 4 \\
 75 \\
 \times 8 \\
 \hline
 0
 \end{array}
 \qquad
 \begin{array}{r}
 4 \\
 75 \\
 \times 8 \\
 \hline
 600
 \end{array}$$

$5 \times 8 = 40$,
 4 is carried.

$7 \times 8 + 4 =$
 $56 + 4 = 60$

You can choose which one you use. Discuss it with your teacher.

1. Multiply. Be careful with the carrying.

a.

	5	3
X		8
<hr/>		

b.

	5	1
X		6
<hr/>		

c.

	8	8
X		3
<hr/>		

d.

	7	9
X		3
<hr/>		

e.

	6	2
X		2
<hr/>		

f.

	4	6
X		7
<hr/>		

g.

	1	8
X		5
<hr/>		

h.

	1	9
X		3
<hr/>		

i.

	6	6
X		6
<hr/>		

j.

	3	9
X		9
<hr/>		

k.

	8	7
X		3
<hr/>		

l.

	6	7
X		2
<hr/>		

m.

	2	0
X		9
<hr/>		

n.

	5	4
X		8
<hr/>		

o.

	3	4
X		6
<hr/>		

p.

	4	6
X		2
<hr/>		

q.

	1	7
X		9
<hr/>		

r.

	4	3
X		4
<hr/>		

s.

	7	6
X		8
<hr/>		

t.

	3	5
X		9
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