

8. [Large Number ×]

Skill 8.1 Multiplying a large number by a single digit without carry over, using columns.

MM3.2 11 22 33 44
MM4.1 1 22 33 44

- Multiply the units, tens, hundreds and thousands by the single digit.
- Multiply from right to left.

Q.

$$\begin{array}{r} 312 \\ \times 3 \\ \hline \end{array}$$

A.

$$\begin{array}{r} \text{hundreds} \quad \text{tens} \quad \text{units} \\ 312 \\ \times 3 \\ \hline 936 \end{array}$$

Units first!

Units:
 $3 \times 2 = 6 \Rightarrow 6 \text{ units}$

Tens:
 $3 \times 1 = 3 \Rightarrow 3 \text{ tens}$

Hundreds:
 $3 \times 3 = 9 \Rightarrow 9 \text{ hundreds}$

a)

$$\begin{array}{r} 97 \\ \times 1 \\ \hline \end{array}$$

Units first!

b)

$$\begin{array}{r} 22 \\ \times 4 \\ \hline \end{array}$$

c)

$$\begin{array}{r} 23 \\ \times 3 \\ \hline \end{array}$$

d)

$$\begin{array}{r} 68 \\ \times 1 \\ \hline \end{array}$$

e)

$$\begin{array}{r} 32 \\ \times 3 \\ \hline \end{array}$$

f)

$$\begin{array}{r} 41 \\ \times 2 \\ \hline \end{array}$$

g)

$$\begin{array}{r} 43 \\ \times 2 \\ \hline \end{array}$$

h)

$$\begin{array}{r} 32 \\ \times 2 \\ \hline \end{array}$$

i)

$$\begin{array}{r} 123 \\ \times 3 \\ \hline \end{array}$$

Units first!

j)

$$\begin{array}{r} 332 \\ \times 2 \\ \hline \end{array}$$

k)

$$\begin{array}{r} 808 \\ \times 1 \\ \hline \end{array}$$

l)

$$\begin{array}{r} 112 \\ \times 3 \\ \hline \end{array}$$

m)

$$\begin{array}{r} 340 \\ \times 2 \\ \hline \end{array}$$

n)

$$\begin{array}{r} 131 \\ \times 3 \\ \hline \end{array}$$

o)

$$\begin{array}{r} 413 \\ \times 2 \\ \hline \end{array}$$

p)

$$\begin{array}{r} 322 \\ \times 3 \\ \hline \end{array}$$

Skill 8.2 Multiplying a large number by a single digit with carry over, using columns.

MM3.2 1 1 2 2 3 3 4 4
MM4.1 1 1 2 2 3 3 4 4

- Multiply the units, tens, hundreds and thousands by the single digit.
- Multiply from right to left.
- If there is a 'carry over': First multiply. Then add on the carry over.

Q.

$$\begin{array}{r} 119 \\ \times 8 \\ \hline \end{array}$$

A.

$$\begin{array}{r} \text{hundreds} \quad \text{tens} \quad \text{units} \\ 1 \quad 1 \quad 9 \\ \times 8 \\ \hline 9 \quad 5 \quad 2 \end{array}$$

Units first!

Units:

$$8 \times 9 = 72$$

72 units = 7 tens and 2 units \Rightarrow 2 units
Carry over the 7 tens to the tens column.

Tens:

$$8 \times 1 = 8$$

$$8 + 7 \text{ (carry over)} = 15$$

15 tens = 1 hundred and 5 tens \Rightarrow 5 tens
Carry over the 1 hundred to the hundreds column.

Hundreds:

$$8 \times 1 = 8$$

$$8 + 1 \text{ (carry over)} = 9 \Rightarrow 9 \text{ hundreds}$$

a)

$$\begin{array}{r} 4 \quad 8 \quad 0 \\ \times 5 \\ \hline 4 \quad 0 \quad 0 \end{array}$$

Units first!

b)

$$\begin{array}{r} 9 \quad 0 \\ \times 4 \\ \hline \end{array}$$

c)

$$\begin{array}{r} 9 \quad 4 \\ \times 2 \\ \hline \end{array}$$

d)

$$\begin{array}{r} 1 \quad 5 \\ \times 3 \\ \hline \end{array}$$

e)

$$\begin{array}{r} 2 \quad 6 \\ \times 3 \\ \hline \end{array}$$

f)

$$\begin{array}{r} 2 \quad 3 \\ \times 7 \\ \hline \end{array}$$

g)

$$\begin{array}{r} 4 \quad 3 \\ \times 5 \\ \hline \end{array}$$

h)

$$\begin{array}{r} 8 \quad 2 \\ \times 6 \\ \hline \end{array}$$

i)

$$\begin{array}{r} 1 \quad 6 \quad 4 \\ \times 2 \\ \hline 3 \quad 2 \quad 8 \end{array}$$

Units first!

j)

$$\begin{array}{r} 2 \quad 0 \quad 7 \\ \times 5 \\ \hline \end{array}$$

k)

$$\begin{array}{r} 1 \quad 0 \quad 9 \\ \times 7 \\ \hline \end{array}$$

l)

$$\begin{array}{r} 2 \quad 0 \quad 8 \\ \times 4 \\ \hline \end{array}$$

m)

$$\begin{array}{r} 1 \quad 4 \quad 0 \\ \times 6 \\ \hline \end{array}$$

n)

$$\begin{array}{r} 1 \quad 6 \quad 7 \\ \times 3 \\ \hline \end{array}$$

o)

$$\begin{array}{r} 4 \quad 1 \quad 0 \\ \times 8 \\ \hline \end{array}$$

p)

$$\begin{array}{r} 4 \quad 2 \quad 2 \\ \times 5 \\ \hline \end{array}$$

Skill 8.3 Multiplying a large number by a two-digit number, using columns.

MM3.2 11 22 33 44
MM4.1 11 22 33 44

- Multiply by the unit digit first, working from right to left.
Reminder: Put a zero in the units place before you start multiplying by the tens.
- Then multiply by the ten digit, working from right to left.
- Add the results last.

Q.

$$\begin{array}{r} 85 \\ \times 14 \\ \hline \end{array}$$

A.

$$\begin{array}{r} 85 \\ \times 14 \\ \hline 340 \\ \hline \end{array}$$

thousands
hundreds
tens
units

$\times 4$
first!

$$\begin{array}{r} 85 \\ \times 14 \\ \hline 1340 \\ 850 \\ \hline 1190 \end{array}$$

$\times 1$
next!

+

last!

First multiply 85 by the 4 units.

Units:

$4 \times 5 = 20$

$20 \text{ units} = 2 \text{ tens and } 0 \text{ units} \Rightarrow 0 \text{ units}$

Carry over the 2 tens to the tens column.

Tens:

$4 \times 8 = 32$

$32 + 2 \text{ (carry over)} = 34$

$34 \text{ tens} = 3 \text{ hundreds and } 4 \text{ tens} \Rightarrow 4 \text{ tens}$

Hundreds:

$\Rightarrow 3 \text{ hundreds}$

Then multiply 85 by the 1 ten.

Units:

Write 0 as a place holder for the ten.

$\Rightarrow 0 \text{ units}$

Tens:

$1 \times 5 = 5$

$\Rightarrow 5 \text{ tens}$

Hundreds:

$1 \times 8 = 8$

$\Rightarrow 8 \text{ hundreds}$

Add these results: $340 + 850 = 1190$

a)

$$\begin{array}{r} 34 \\ \times 21 \\ \hline 134 \\ 680 \\ \hline 714 \end{array}$$

$\times 1$ first!
 $\times 2$ next!
Use zero as a place holder
+ last!

b)

$$\begin{array}{r} 15 \\ \times 32 \\ \hline 30 \\ \hline \end{array}$$

$\times 2$ first!
 $\times 3$ next!
Use zero as a place holder

c)

$$\begin{array}{r} 24 \\ \times 43 \\ \hline \end{array}$$

$\times 3$ first!

d)

$$\begin{array}{r} 71 \\ \times 62 \\ \hline \end{array}$$

e)

$$\begin{array}{r} 55 \\ \times 45 \\ \hline \end{array}$$

f)

$$\begin{array}{r} 82 \\ \times 73 \\ \hline \end{array}$$

g)

$$\begin{array}{r} 46 \\ \times 38 \\ \hline \end{array}$$

h)

$$\begin{array}{r} 33 \\ \times 96 \\ \hline \end{array}$$