

6. [Large Number \times, \div]

Skill 6.1 Multiplying a large number by a single digit without carry over, using columns.

MMYellow 1 1 2 2 3 3 4 4
MMRed 1 1 2 2 3 3 4 4

- 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.

	hundreds	tens	units
	3	1	2
×			3
9	3	6	

Units first!

Units:

$3 \times 2 = 6$

\Rightarrow 6 units

Tens:

$3 \times 1 = 3$

\Rightarrow 3 tens

Hundreds:

$3 \times 3 = 9$

\Rightarrow 9 hundreds

a)

	9	7
×		1
9	7	

Units first!

b)

	2	2
×		4

c)

	2	3
×		3

d)

	6	8
×		1

e)

	3	2
×		3

f)

	4	1
×		2

g)

	4	3
×		2

h)

	3	2
×		2

i)

	1	2	3
×			3
3	6	9	

Units first!

j)

	3	3	2
×			2

k)

	8	0	8
×			1

l)

	1	1	2
×			3

m)

	3	4	0
×			2

n)

	1	3	1
×			3

o)

	4	1	3
×			2

p)

	3	2	2
×			3

Skill 6.2 Multiplying a large number by a single digit with carry over, using columns.

- 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:
 $8 \times 9 = 72$
 $72 \text{ units} = 7 \text{ tens and } 2 \text{ units} \Rightarrow 2 \text{ units}$
 Carry over the 7 tens to the tens column.

Tens:
 $8 \times 1 = 8$
 $8 + 7 \text{ (carry over)} = 15$
 $15 \text{ tens} = 1 \text{ hundred and } 5 \text{ tens} \Rightarrow 5 \text{ tens}$
 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)

$$\begin{array}{r} 80 \\ \times 5 \\ \hline 400 \end{array}$$

Units first!

b)

$$\begin{array}{r} 90 \\ \times 4 \\ \hline \end{array}$$

c)

$$\begin{array}{r} 94 \\ \times 2 \\ \hline \end{array}$$

d)

$$\begin{array}{r} 15 \\ \times 3 \\ \hline \end{array}$$

e)

$$\begin{array}{r} 26 \\ \times 3 \\ \hline \end{array}$$

f)

$$\begin{array}{r} 23 \\ \times 7 \\ \hline \end{array}$$

g)

$$\begin{array}{r} 43 \\ \times 5 \\ \hline \end{array}$$

h)

$$\begin{array}{r} 82 \\ \times 6 \\ \hline \end{array}$$

i)

$$\begin{array}{r} 164 \\ \times 2 \\ \hline 328 \end{array}$$

Units first!

j)

$$\begin{array}{r} 207 \\ \times 5 \\ \hline \end{array}$$

k)

$$\begin{array}{r} 109 \\ \times 7 \\ \hline \end{array}$$

l)

$$\begin{array}{r} 208 \\ \times 4 \\ \hline \end{array}$$

m)

$$\begin{array}{r} 140 \\ \times 6 \\ \hline \end{array}$$

n)

$$\begin{array}{r} 167 \\ \times 3 \\ \hline \end{array}$$

o)

$$\begin{array}{r} 410 \\ \times 8 \\ \hline \end{array}$$

p)

$$\begin{array}{r} 422 \\ \times 5 \\ \hline \end{array}$$

Skill 6.3 Multiplying a large number by a two-digit number, using columns.

- 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.

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

A.

thousands hundreds tens units

$$\begin{array}{r} 2 \\ 85 \\ \times 14 \\ \hline 340 \\ \hline \end{array}$$

×4 first!

$$\begin{array}{r} 2 \\ 85 \\ \times 14 \\ \hline 340 \\ 850 \\ \hline 1190 \\ \hline \end{array}$$

×1 next!

+ last!

First multiply 85 by the 4 units.

Units:

$$4 \times 5 = 20$$

20 units = 2 tens and 0 units \Rightarrow 0 units

Carry over the 2 tens to the tens column.

Tens:

$$4 \times 8 = 32$$

32 + 2 (carry over) = 34

34 tens = 3 hundreds and 4 tens \Rightarrow 4 tens

Hundreds:

\Rightarrow 3 hundreds

Then multiply 85 by the 1 ten.

Units:

Write 0 as a place holder for the ten.

\Rightarrow 0 units

Tens:

$$1 \times 5 = 5$$

\Rightarrow 5 tens

Hundreds:

$$1 \times 8 = 8$$

\Rightarrow 8 hundreds

Add these results: $340 + 850 = 1190$

a)

$$\begin{array}{r} 34 \\ \times 21 \\ \hline 734 \\ 680 \\ \hline 714 \\ \hline \end{array}$$

×1 first!

×2 next!

Use zero as a place holder

+ last!

b)

$$\begin{array}{r} 1 \\ 15 \\ \times 32 \\ \hline 30 \\ \hline \end{array}$$

×2 first!

×3 next!

Use zero as a place holder

c)

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

×3 first!

d)

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

e)

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

f)

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

g)

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

h)

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

Skill 6.4 Dividing a large number by a single digit, without carry over.

- Divide from left to right across the digits, one at a time.

Q. $\boxed{}$

$$2 \overline{) 486}$$

A. $\boxed{243}$

hundreds first!

$$2 \overline{) 486}$$

hundreds tens units

Hundreds:

$4 \div 2 = 2 \Rightarrow 2 \text{ hundreds}$

Tens:

$8 \div 2 = 4 \Rightarrow 4 \text{ tens}$

Units:

$6 \div 2 = 3 \Rightarrow 3 \text{ units}$

Read as: 486 divided by 2
OR How many 2's go into 486?
OR 486 divides by 2 how many times?

Consider: $486 \div 2 = 243$
 $2 \times 243 = 486$

a) $\boxed{200}$

hundreds first!

$$3 \overline{) 600}$$

b) $\boxed{}$

$$2 \overline{) 800}$$

c) $\boxed{}$

$$3 \overline{) 900}$$

d) $\boxed{}$

$$7 \overline{) 770}$$

e) $\boxed{}$

$$4 \overline{) 408}$$

f) $\boxed{}$

$$3 \overline{) 306}$$

g) $\boxed{}$

$$2 \overline{) 284}$$

h) $\boxed{}$

$$3 \overline{) 369}$$

i) $\boxed{}$

thousands first!

$$3 \overline{) 6000}$$

j) $\boxed{}$

$$2 \overline{) 2860}$$

k) $\boxed{}$

$$2 \overline{) 8864}$$

l) $\boxed{}$

$$3 \overline{) 9063}$$

m) $\boxed{}$

thousands first!

$$2 \overline{) 8000}$$

n) $\boxed{}$

$$2 \overline{) 4806}$$

o) $\boxed{}$

$$3 \overline{) 3009}$$

p) $\boxed{}$

$$4 \overline{) 4048}$$

Skill 6.5 Dividing a large number by a single digit, with carry over
- no remainder.

- Divide from left to right across the digits one at a time.
- If any result is less than 1: Break down the number being divided into. 'Carry over' this amount to the next column. Add on the carry. Then try dividing again.

Q. $\begin{array}{r} \square \\ 4 \overline{) 128} \end{array}$

A. $\begin{array}{r} \square \quad \square \\ 4 \overline{) 128} \\ \text{hundreds} \\ \text{first!} \\ \text{hundreds} \\ \text{tens} \\ \text{units} \end{array}$

Hundreds:

$1 \div 4 = ?$

The result is < 1 .

Break down the 1 hundred into 10 tens and carry them to the tens column.

Tens:

$2 + 10$ (carry over) $= 12$

$12 \div 4 = 3 \Rightarrow 3$ tens

Units:

$8 \div 4 = 2$

$\Rightarrow 2$ units

Read as: 128 divided by 4
OR How many 4's go into 128?
OR 128 divides by 4 how many times?

Consider: $128 \div 4 = 32$
 $4 \times 32 = 128$

a) $\begin{array}{r} \square \quad \square \quad \square \\ 5 \overline{) 515} \\ \text{hundreds} \\ \text{first!} \end{array}$

b) $\begin{array}{r} \square \quad \square \\ 2 \overline{) 324} \\ \text{hundreds} \\ \text{first!} \end{array}$

c) $\begin{array}{r} \square \quad \square \\ 3 \overline{) 453} \end{array}$

d) $\begin{array}{r} \square \quad \square \\ 7 \overline{) 392} \end{array}$

e) $\begin{array}{r} \square \quad \square \\ 4 \overline{) 312} \end{array}$

f) $\begin{array}{r} \square \quad \square \\ 8 \overline{) 592} \end{array}$

g) $\begin{array}{r} \square \quad \square \\ 6 \overline{) 204} \end{array}$

h) $\begin{array}{r} \square \quad \square \\ 9 \overline{) 369} \end{array}$

i) $\begin{array}{r} \square \quad \square \quad \square \\ 5 \overline{) 5150} \\ \text{thousands} \\ \text{first!} \end{array}$

j) $\begin{array}{r} \square \quad \square \\ 3 \overline{) 4125} \end{array}$

k) $\begin{array}{r} \square \quad \square \\ 2 \overline{) 1734} \end{array}$

l) $\begin{array}{r} \square \quad \square \\ 4 \overline{) 1060} \end{array}$