7. [Powers of 10 ×,÷]

Skill 7.1   Multiplying a whole number by a power of 10 using zeros as place holders.

- When multiplying by 10 move each digit one place to the left.
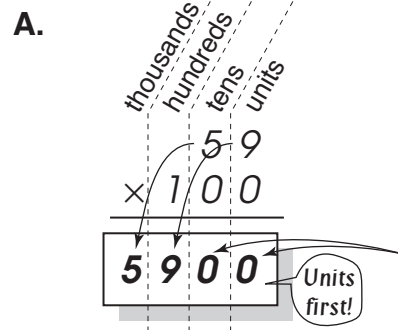

Use zero as a place holder
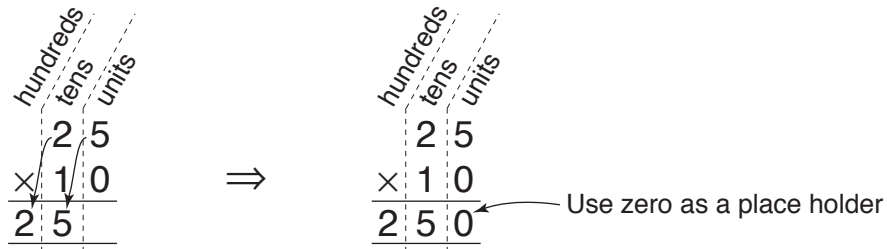
> *Hint:*   *Multiplying by a power of 10 does not change the digits in the number.*
>   *Example:* $25 \times 10 = 250$ *the 2 and the 5 remain in the answer.*

- When multiplying by 100 move each digit two places to the left.
- When multiplying by 1000 move each digit three places to the left, etc.
- Add zeros as place holders in the vacated places.

Q.
$$\begin{array}{r} 59 \\ \times\,100 \\ \hline \end{array}$$

A.

5 9 0 0   *Units first!*

59×100 means 59 groups of 100.

Shift 5 and 9 two places to the left.

Use 0's as place holders in the vacated units and tens places.

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a)
$$\begin{array}{r} 70 \\ \times\,10 \\ \hline \end{array}$$
700   Use zero as a place holder

b)
$$\begin{array}{r} 20 \\ \times\,10 \\ \hline 0 \end{array}$$

c)
$$\begin{array}{r} 224 \\ \times\,10 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 376 \\ \times\,10 \\ \hline \end{array}$$

e)
$$\begin{array}{r} 25 \\ \times\,100 \\ \hline 00 \end{array}$$

f)
$$\begin{array}{r} 73 \\ \times\,100 \\ \hline \end{array}$$

g)
$$\begin{array}{r} 80 \\ \times\,100 \\ \hline \end{array}$$

h)
$$\begin{array}{r} 50 \\ \times\,100 \\ \hline \end{array}$$

i)
$$\begin{array}{r} 24 \\ \times\,1000 \\ \hline \end{array}$$

j)
$$\begin{array}{r} 39 \\ \times\,1000 \\ \hline \end{array}$$

k)
$$\begin{array}{r} 10 \\ \times\,1000 \\ \hline \end{array}$$

l)
$$\begin{array}{r} 800 \\ \times\,1000 \\ \hline \end{array}$$

Q.
$$17$$
$$\times 100$$

A.

thousands / hundreds / tens / units

$$1\ 7$$
$$\times 1\ 0\ 0$$
$$\boxed{1\ 7\ 0\ 0}$$ ⟵ (Units first!)

Units:
$0 \times 17 = 0$ ⟹ 0 units

Tens:
$0 \times 17 = 0$ ⟹ 0 tens

Hundreds:
$1 \times 17 = 17$
17 hundreds = 1 thousand + 7 hundreds
         ⟹ 7 hundreds
         ⟹ 1 thousand

Hint: One thousand, seven hundred can also be called seventeen hundred.

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a)
$$5\ 6$$
$$\times 1\ 0$$
$$\boxed{5\ 6\ 0}$$ ⟵ (Units first!)

b)
$$4\ 3$$
$$\times 1\ 0$$
$$\boxed{}$$ ⟵ (Units first!)

c)
$$2\ 3$$
$$\times 1\ 0$$
$$\boxed{}$$

d)
$$6\ 8$$
$$\times 1\ 0$$
$$\boxed{}$$

e)
$$3\ 0$$
$$\times 1\ 0$$
$$\boxed{}$$

f)
$$4\ 0$$
$$\times 1\ 0$$
$$\boxed{}$$

g)
$$6\ 5\ 8$$
$$\times\ \ \ 1\ 0$$
$$\boxed{}$$

h)
$$8\ 5\ 4$$
$$\times\ \ \ 1\ 0$$
$$\boxed{}$$

i)
$$4\ 7$$
$$\times 1\ 0\ 0$$
$$\boxed{4\ 7\ 0\ 0}$$

j)
$$7\ 5$$
$$\times 1\ 0\ 0$$
$$\boxed{}$$

k)
$$8\ 0$$
$$\times 1\ 0\ 0$$
$$\boxed{}$$

l)
$$5\ 0$$
$$\times 1\ 0\ 0$$
$$\boxed{}$$

m)
$$9\ 5\ 3$$
$$\times 1\ 0\ 0$$
$$\boxed{}$$

n)
$$4\ 0\ 2$$
$$\times 1\ 0\ 0$$
$$\boxed{}$$

o)
$$7\ 0$$
$$\times 1\ 0\ 0\ 0$$
$$\boxed{}$$

p)
$$3\ 0$$
$$\times 1\ 0\ 0\ 0$$
$$\boxed{}$$

q)
$$6\ 2$$
$$\times 1\ 0\ 0\ 0$$
$$\boxed{}$$

r)
$$9\ 8$$
$$\times 1\ 0\ 0\ 0$$
$$\boxed{}$$

s)
$$2\ 0\ 0$$
$$\times 1\ 0\ 0\ 0$$
$$\boxed{}$$

t)
$$6\ 0\ 5$$
$$\times 1\ 0\ 0\ 0$$
$$\boxed{}$$

- Convert the division to a fraction and.......

EITHER
- Divide both the numerator and the denominator by the value of the denominator.

$$40 \div 10 = \quad \frac{40}{10} = \frac{40 \div 10}{10 \div 10} = \frac{4}{1} = 4$$

$$600 \div 100 = \quad \frac{600}{100} = \frac{600 \div 100}{100 \div 100} = \frac{6}{1} = 6$$

OR
- Cancel the zeros in the numerator against the zeros in the denominator.

$$\frac{40}{10} = \frac{4\cancel{0}}{1\cancel{0}} = \frac{4}{1} = 4$$

$$\frac{600}{100} = \frac{6\cancel{00}}{1\cancel{00}} = \frac{6}{1} = 6$$

Q. $5400 \div 100 =$

A. $5400 \div 100 =$

$$= \frac{5400 \div 100}{100 \div 100}$$

$$= \frac{54}{1}$$

$$= \mathbf{54}$$

How many groups of 100 make up 5400?

Convert the division to a fraction.

Divide the numerator and the denominator by 100.

54 groups of 100 make up 5400.

Hint: Five thousand, four hundred can also be called fifty-four hundred.

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a) $800 \div 100 =$

$$= \frac{8\cancel{00}}{1\cancel{00}} =$$

☐ 8

b) $70 \div 10 =$

$$= \frac{\quad}{\quad}$$

☐

c) $850 \div 10 =$

$$= \frac{\quad}{\quad}$$

☐

d) $900 \div 100 =$

$$= \frac{\quad}{\quad}$$

☐

e) $500 \div 100 =$

$$= \frac{\quad}{\quad}$$

☐

f) $2400 \div 100 =$

$$= \frac{\quad}{\quad}$$

☐

g) $13,200 \div 100 =$

$$= \frac{\quad}{\quad}$$

☐

h) $9800 \div 10 =$

$$= \frac{\quad}{\quad}$$

☐

i) $15,000 \div 1000 =$

$$= \frac{\quad}{\quad}$$

☐

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Skill 7.4   Dividing a whole number by a power of 10 by removing zeros or changing place values.

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

EITHER

- Remove the same number of zeros as in the divisor from the end of the whole number.
  (1 for 10,
  2 for 100,
  3 for 1000, etc.)
  Example:
  $$98,00\emptyset \div 1\emptyset = 9800$$
  $$98,0\emptyset\emptyset \div 10\emptyset = 980$$
  $$98,\emptyset\emptyset\emptyset \div 100\emptyset = 98$$

OR

- Move the decimal point the same number of places to the left as there are zeros in the divisor.

  Hint: There is a decimal point and zeros which are not written, at the end of any whole number.

  1 zero ⇒ 1 place left. $98,000.0 \Rightarrow 9800$
  2 zeros ⇒ 2 places left. $98,000.0 \Rightarrow 980$
  3 zeros ⇒ 3 places left. $98,000.0 \Rightarrow 98$

Q. $44,000 \div 1000 =$

A. $44,000 \div 1000$
$= 44,\emptyset\emptyset\emptyset \div 1\emptyset\emptyset\emptyset$
$= \textbf{44}$

1000 has 3 zeros.
To divide by 1000 remove 3 zeros from both numbers.

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a) $600 \div 10 =$

$= 600.0 \div 10$

$\boxed{60}$

b) $90 \div 10 =$

$=$ ....

c) $330 \div 10 =$

$=$ ....

d) $1600 \div 10 =$

$=$ ....

e) $5500 \div 10 =$

$=$ ....

f) $400 \div 100 =$

$=$ ....

g) $800 \div 100 =$

$=$ ....

h) $9500 \div 100 =$

$=$ ....

i) $7100 \div 100 =$

$=$ ....

j) $45,900 \div 100 =$

$=$ ....

k) $9000 \div 1000 =$

$=$ ....

l) $74,000 \div 1000 =$

$=$ ....