7. [Powers of 10 ×,÷]
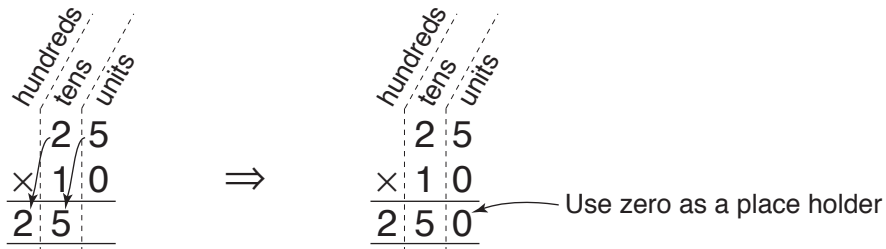
Skill 7.1   Multiplying a whole number by a power of 10 using zeros as place holders.

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

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

$$
\begin{array}{r}
2\,5 \\
\times\,1\,0 \\
\hline
2\,5
\end{array}
\quad\Rightarrow\quad
\begin{array}{r}
2\,5 \\
\times\,1\,0 \\
\hline
2\,5\,0
\end{array}
$$

— Use zero as a place holder

Hint: Multiplying by a power of 10 does not change the digits in the number.
Example: 25 × 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.
- Add zeros as place holders in the vacated places.

Q.
$$
\begin{array}{r}
5\,9 \\
\times\,1\,0\,0 \\
\hline

\end{array}
$$

A.
$$
\begin{array}{r}
5\,9 \\
-\,1\,0\,0 \\
\hline
5\,9\,0\,0
\end{array}
$$
Units first!
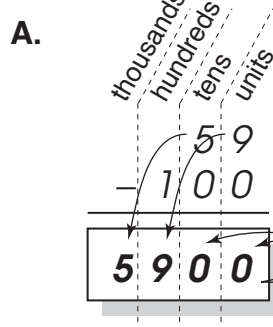
59 × 100 means 59 groups of 100.

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)
$$
\begin{array}{r}
7\,0 \\
\times\,1\,0 \\
\hline
7\,0\,0
\end{array}
$$
Use zero as a place holder

b)
$$
\begin{array}{r}
2\,5 \\
\times\,1\,0 \\
\hline

\end{array}
$$

c)
$$
\begin{array}{r}
2\,2\,4 \\
\times\,1\,0 \\
\hline

\end{array}
$$

d)
$$
\begin{array}{r}
3\,7\,0 \\
\times\,1\,0 \\
\hline

\end{array}
$$

e)
$$
\begin{array}{r}
2\,5 \\
\times\,1\,0\,0 \\
\hline

\end{array}
$$

f)
$$
\begin{array}{r}
7\,3 \\
\times\,1\,0\,0 \\
\hline

\end{array}
$$

g)
$$
\begin{array}{r}
8\,0 \\
\times\,1\,0\,0 \\
\hline

\end{array}
$$

h)
$$
\begin{array}{r}
1\,0\,9 \\
\times\,1\,0\,0 \\
\hline

\end{array}
$$

i)
$$
\begin{array}{r}
3\,9 \\
\times\,1\,0\,0\,0 \\
\hline

\end{array}
$$

j)
$$
\begin{array}{r}
6\,0 \\
\times\,1\,0\,0\,0 \\
\hline

\end{array}
$$

k)
$$
\begin{array}{r}
8\,5\,0 \\
\times\,1\,0\,0\,0 \\
\hline

\end{array}
$$

l)
$$
\begin{array}{r}
2\,4\,7 \\
\times\,1\,0\,0\,0 \\
\hline

\end{array}
$$

- When multiplying a number by a power of 10, simply add the same number of zeros at the end of the number.

Q.
$$\begin{array}{r} 1\ 7 \\ \times\ 1\ 0\ 0 \\ \hline \end{array}$$

A.

thousands / hundreds / tens / units

$$\begin{array}{r} 1\ 7 \\ \times\ 1\ 0\ 0 \\ \hline 1\ 7\ 0\ 0 \end{array}$$ (Units first!)

Units:
$0 \times 17 = 0$ $\Rightarrow$ 0 units

Tens:
$0 \times 17 = 0$ $\Rightarrow$ 0 tens

Hundreds:
$1 \times 17 = 17$
17 hundreds = 1 thousand + 7 hundreds
   $\Rightarrow$ 7 hundreds
Carry over the 1 thousand to the thousands column.

Thousands: $\Rightarrow$ 1 thousand

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

a)
$$\begin{array}{r} 5\ 6 \\ \times\ 1\ 0 \\ \hline 5\ 6\ 0 \end{array}$$ (Units first!)

b)
$$\begin{array}{r} 1\ 3\ 8 \\ \times\quad\ 1\ 0 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 4\ 7\ 0 \\ \times\quad\ 1\ 0 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 2\ 0\ 9\ 5 \\ \times\qquad\ 1\ 0 \\ \hline \end{array}$$

e)
$$\begin{array}{r} 4\ 7 \\ \times\ 1\ 0\ 0 \\ \hline \end{array}$$

f)
$$\begin{array}{r} 7\ 5 \\ \times\ 1\ 0\ 0 \\ \hline \end{array}$$

g)
$$\begin{array}{r} 5\ 0 \\ \times\ 1\ 0\ 0 \\ \hline \end{array}$$

h)
$$\begin{array}{r} 9\ 5\ 3 \\ \times\ 1\ 0\ 0 \\ \hline \end{array}$$

i)
$$\begin{array}{r} 6\ 0\ 0 \\ \times\ 1\ 0\ 0 \\ \hline \end{array}$$

j)
$$\begin{array}{r} 3\ 4\ 0 \\ \times\ 1\ 0\ 0 \\ \hline \end{array}$$

k)
$$\begin{array}{r} 7\ 0\ 2 \\ \times\ 1\ 0\ 0 \\ \hline \end{array}$$

l)
$$\begin{array}{r} 5\ 8\ 1 \\ \times\ 1\ 0\ 0 \\ \hline \end{array}$$

m)
$$\begin{array}{r} 9\ 8 \\ \times\ 1\ 0\ 0\ 0 \\ \hline \end{array}$$

n)
$$\begin{array}{r} 7\ 0 \\ \times\ 1\ 0\ 0\ 0 \\ \hline \end{array}$$

o)
$$\begin{array}{r} 9\ 5\ 0 \\ \times\ 1\ 0\ 0\ 0 \\ \hline \end{array}$$

p)
$$\begin{array}{r} 3\ 2\ 6 \\ \times\ 1\ 0\ 0\ 0 \\ \hline \end{array}$$

- 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. $5400 \div 100 =$

$$= \frac{5400}{100} {\scriptstyle \begin{array}{l} \div 100 \\ \div 100 \end{array}}$$

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

$$= \mathbf{54}$$

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) $70 \div 10 =$

$$= \frac{}{}$$

c) $850 \div 10 =$

$$= \frac{}{}$$

d) $900 \div 100 =$

$$= \frac{}{}$$

e) $500 \div 100 =$

$$= \frac{}{}$$

f) $2400 \div 100 =$

$$= \frac{}{}$$

g) $13\,200 \div 100 =$

$$= \frac{}{}$$

h) $9800 \div 10 =$

$$= \frac{}{}$$

i) $15\,000 \div 1000 =$

$$= \frac{}{}$$

Skill 7.4	Dividing a whole number by a power of 10 by removing zeros or changing place values.	MM3.2 1 2 3 4 MM4.1 1 2 3 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:

$98\,00\cancel{0} \div 1\cancel{0} = 9800$
$98\,0\cancel{00} \div 1\cancel{00} = 980$
$98\,\cancel{000} \div 1\cancel{000} = 98$

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. $44\,000 \div 1000 =$
$= 44\,\cancel{000} \div 1\cancel{000}$
$= \mathbf{44}$

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

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a) $600 \div 10 =$
$= 600.0 \div 10$
....
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) $74\,000 \div 1000 =$
$=$
....