Multiplying by Whole Tens and Hundreds

1. a. Ten tens make a hundred. How about 20 tens or more?

<table>
<thead>
<tr>
<th>10 tens</th>
<th>13 tens</th>
<th>20 tens</th>
<th>21 tens</th>
<th>37 tens</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 \times 10 = ____</td>
<td>13 \times 10 = ____</td>
<td>20 \times 10 = ____</td>
<td>21 \times 10 = ____</td>
<td>37 \times 10 = ____</td>
</tr>
</tbody>
</table>

b. Ten hundreds make a thousand. How about 20 hundreds or more?

<table>
<thead>
<tr>
<th>10 hundreds</th>
<th>12 hundreds</th>
<th>15 hundreds</th>
<th>18 hundreds</th>
<th>20 hundreds</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 \times 100 = ____</td>
<td>12 \times 100 = ____</td>
<td>15 \times 100 = ____</td>
<td>18 \times 100 = ____</td>
<td>20 \times 100 = ____</td>
</tr>
</tbody>
</table>

56 \times 10 is the same as 10 \times 56. Both are 560.

92 \times 100 is the same as 100 \times 92. Both are 9,200.

To multiply a number by 10, just tag a zero on the end. To multiply a number by 100, just tag two zeros on the end.

<table>
<thead>
<tr>
<th>100 \times 56 = 5600</th>
<th>100 \times 47 = 4700</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 \times 481 = 4,810</td>
<td>100 \times 2,043 = 204,300</td>
</tr>
</tbody>
</table>

Note especially what happens when the number you multiply already ends in a zero. The rule works the same; you still have to tag a zero or two zeros.

<table>
<thead>
<tr>
<th>100 \times 60 = 6000</th>
<th>100 \times 20 = 2,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 \times 500 = 5,0000</td>
<td>100 \times 3,400 = 340,000</td>
</tr>
</tbody>
</table>

2. Multiply.

a. 10 \times 315 = ____
b. 100 \times 62 = ____
c. 10 \times 25,000 = ____

3,560 \times 10 = ____

10 \times 1,200 = ____

100 \times 25,000 = ____

35 \times 100 = ____

100 \times 130 = ____

10 \times 5,060 = ____

\textbf{What is } 20 \times 14? \\ Imagine the problem without the zero. \\ Then it becomes \( 2 \times 14 = 28 \). Then, just tag a zero to the end result: \( 20 \times 14 = 280 \).

\textbf{Why does that work?} It is based on the fact that \( 20 = 10 \times 2 \). For example,

\[
20 \times 14 = 10 \times 2 \times 14
\]
In that problem, first multiply \( 2 \times 14 = 28 \). Then multiply by ten:

\[
10 \times (2 \times 14) = 10 \times 28 = 280.
\]

\[\text{What is } 200 \times 31? \]
Imagine the problem without the zeros. \\ Then it becomes \( 2 \times 31 = 62 \). Then, just tag \textbf{two} zeros to the result: \( 200 \times 31 = 6,200 \).

\textbf{Why does that work?} It is based on the fact that \( 200 = 100 \times 2 \). For example,

\[
200 \times 31 = 100 \times 2 \times 31
\]
In that problem, you can multiply first \( 2 \times 31 = 62 \). Then multiply by a hundred:

\[
100 \times (2 \times 31) = 100 \times 62 = 6,200.
\]

\textbf{a. } 20 \times 8 = \underline{ } \quad \textbf{b. } 200 \times 7 = \underline{ } \quad \textbf{c. } 20 \times 12 = \underline{ } \quad \textbf{d. } 20 \times 16 = \underline{ } \\
4 \times 20 = \underline{ } \quad 5 \times 200 = \underline{ } \quad 35 \times 20 = \underline{ } \quad 42 \times 200 = \underline{ } \\
20 \times 5 = \underline{ } \quad 11 \times 200 = \underline{ } \quad 200 \times 9 = \underline{ } \quad 54 \times 20 = \underline{ } \]

The same principle works if you multiply by 30, 40, 50, 60, 70, 80, or 90. You can imagine multiplying by 3, 4, 5, 6, 7, 8, or 9, and then tag a zero into the end result.

Similarly, if you multiply by some whole hundred, imagine multiplying without those two zeros, and tag the two zeros to the end result.

\[
\begin{array}{ll}
50 \times 8 = 400 & \quad 90 \times 11 = 990 \\
300 \times 8 = 2,400 & \quad 12 \times 800 = 9,600
\end{array}
\]


\textbf{a. } 40 \times 3 = \underline{ } \quad \textbf{b. } 70 \times 6 = \underline{ } \quad \textbf{c. } 80 \times 9 = \underline{ } \quad \textbf{d. } 60 \times 11 = \underline{ } \\
8 \times 20 = \underline{ } \quad 50 \times 11 = \underline{ } \quad 30 \times 15 = \underline{ } \quad 12 \times 40 = \underline{ } \\
\textbf{e. } 200 \times 9 = \underline{ } \quad \textbf{f. } 700 \times 6 = \underline{ } \quad \textbf{g. } 200 \times 12 = \underline{ } \quad \textbf{h. } 3 \times 1100 = \underline{ } \\
7 \times 400 = \underline{ } \quad 600 \times 11 = \underline{ } \quad 15 \times 300 = \underline{ } \quad 8 \times 900 = \underline{ }
It even works this way:

In a problem $40 \times 70$ you can just multiply $4 \times 7$, and tag two zeros to the result:

$$40 \times 70 = 2,800$$

In a problem $600 \times 40$ you can multiply $6 \times 4$, and tag three zeros to the result:

$$600 \times 40 = 24,000$$

In a problem $700 \times 800$ you can multiply $7 \times 8$, and tag four zeros to the result.

$$700 \times 800 = 560,000$$

5. Multiply.

a. $20 \times 90 = 1,800$

b. $60 \times 80 = 4,800$

c. $400 \times 50 = 20,000$

d. $80 \times 800 = 64,000$

e. $100 \times 100 = 100,000$

f. $800 \times 300 = 240,000$

6. Write different factors for these products, using whole tens and whole hundreds.

<table>
<thead>
<tr>
<th>Have you noticed?</th>
<th>a. $6 \times ____ = 420$ and $60 \times ____ = 420$</th>
<th>b. ____ $\times ____ = 350$ and $____ \times ____ = 350$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$7 \times 80 = 560$ and $70 \times 8 = 560$!!</td>
<td>c. ____ $\times ____ = 280$ and $____ \times ____ = 280$</td>
<td>d. ____ $\times ____ = 400$ and $____ \times ____ = 400$</td>
</tr>
<tr>
<td></td>
<td>e. ____ $\times ____ = 990$ and $____ \times ____ = 990$</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Have you noticed?</th>
<th>f. $2 \times ____ = 1,800$ and $20 \times ____ = 1,800$</th>
<th>g. ____ $\times ____ = 5,400$ and $____ \times ____ = 5,400$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$6 \times 400 = 2,400$ and $60 \times 40 = 2,400$ and $600 \times 4 = 2,400$!!</td>
<td>h. ____ $\times ____ = 3,000$ and $____ \times ____ = 3,000$ and $____ \times ____ = 3,000$</td>
<td>i. ____ $\times ____ = 3,600$ and $____ \times ____ = 3,600$ and $____ \times ____ = 3,600$</td>
</tr>
<tr>
<td></td>
<td>j. ____ $\times ____ = 3,600$ and $____ \times ____ = 3,600$ and $____ \times ____ = 3,600$</td>
<td></td>
</tr>
</tbody>
</table>