

Long Multiplication

Step 1

Set out your multiplication in the formal method. Multiply the top ones digit by the ones multiplier as if you were doing short multiplication. Carry any extra digits if needed and ensure to add them to the next number.

$$\begin{array}{r}
 217 \\
 \times 59 \\
 \hline
 1953 \quad (217 \times 9) \\
 10850 \quad (217 \times 50) \\
 \hline
 12803
 \end{array}$$

(Note: In the original image, the second row is shifted one place to the left, and the final result is 12803. The purple arrow points to the 0 in the second row, which is the result of 217 x 50.)

$$\begin{array}{r}
 3425 \\
 \times \quad 47 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 5083 \\
 \times \quad 96 \\
 \hline
 \end{array}$$

Step 2

Add a zero below the ones digit, this is going to make our tens multiplier into a tens instead of a unit value.

Step 3

Then multiply your top number by your tens multiplier, starting with your units and working your way along like normal.

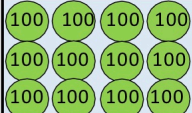
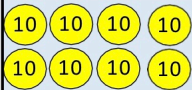
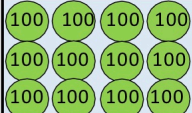
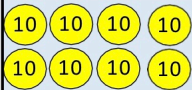
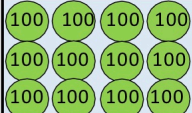
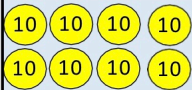
Step 4

Once you have worked out both multiplications, add the answers together.

$$\begin{array}{r}
 6502 \\
 \times \quad 89 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 9467 \\
 \times \quad 34 \\
 \hline
 \end{array}$$

Esin adapts this method to solve 44×32 .

1. Build the length and width using the multiplication calculation	2. Multiply the length by the width	3. Find the total of your area																											
$44 \times 32 =$ <table border="1"> <tr> <td></td> <td>40</td> <td>4</td> </tr> <tr> <td>30</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> </tr> </table>		40	4	30			2			$44 \times 32 =$ <table border="1"> <tr> <td></td> <td>40</td> <td>4</td> </tr> <tr> <td>30</td> <td>  </td> <td>10 10 10 10</td> </tr> <tr> <td>2</td> <td>  </td> <td>1 1 1 1</td> </tr> </table>		40	4	30		10 10 10 10	2		1 1 1 1	$44 \times 32 =$ <table border="1"> <tr> <td></td> <td>40</td> <td>4</td> </tr> <tr> <td>30</td> <td>1,200</td> <td>120</td> </tr> <tr> <td>2</td> <td>80</td> <td>8</td> </tr> </table> $ \begin{array}{r} 1200 \\ 120 \\ 80 \\ 8 \\ \hline 1408 \\ 1 \end{array} $		40	4	30	1,200	120	2	80	8
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Use Esi's method to solve:

- $53 \times 22 =$
- $34 \times 41 =$