
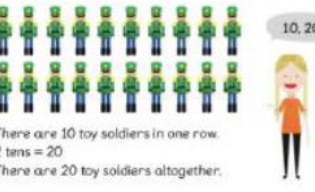
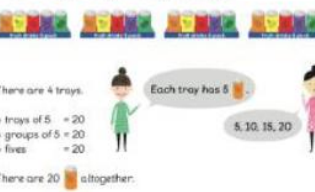
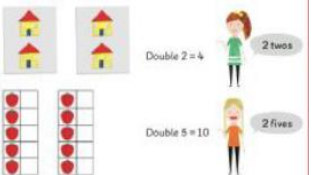



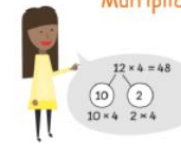



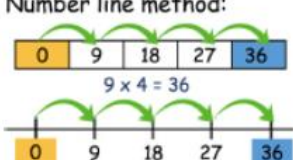



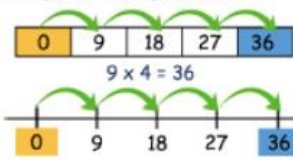
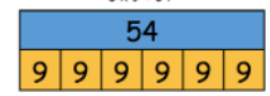



# Calculation Policy: Multiplication

Year 1	Year 2	Year 3	Year 4	Year 5 / 6																									
<p><b>Making equal groups</b></p>  <p><b>Making equal rows</b></p>  <p><b>Adding equal groups</b></p>  <p><b>Making doubles</b></p> 	<p><b>Repeated addition:</b></p> $3 + 3 + 3 + 3 = 12$ <p><b>Grouping Method:</b></p>  <p><b>Groups of:</b></p> $4 \text{ groups of } 3 \text{ is } 12$ <p><b>Number line method:</b></p>  <p><b>Multiplication:</b></p> $4 \times 3 = 12$	<p><b>Arrays:</b></p> <table border="1"> <tr> <td>3 times tables  <math>3 \times 5 = 15</math></td> <td>4 times tables  <math>4 \times 5 = 20</math></td> <td>8 times tables  <math>8 \times 5 = 40</math> <small>(doubling the 4 times table)</small></td> </tr> </table> <p><b>Make a family of multiplication and division facts:</b></p>  <table border="1"> <tr> <td>4 × 4 = 16</td> <td>4 × 6 = 24</td> <td>6 × 4 = 24</td> <td>6 × 6 = 36</td> </tr> <tr> <td>4 × 6 = 24</td> <td>4 × 4 = 16</td> <td>6 × 4 = 24</td> <td>6 × 6 = 36</td> </tr> </table> <p><b>Number bond strategy:</b> <i>Multiplication</i></p>  <p><math>12 \times 4 = 48</math> <math>10 \times 4 = 40</math>   <math>2 \times 4 = 8</math></p> <p><b>Bridged column method:</b> <i>Without renaming</i></p> $13 \times 3 = 39$ <table border="1"> <tr><td>1</td><td>0</td></tr> <tr><td>1</td><td>3</td></tr> <tr><td>×</td><td>3</td></tr> <tr><td>3</td><td>9</td></tr> <tr><td>3</td><td>0</td></tr> <tr><td>+</td><td>3</td></tr> <tr><td>3</td><td>9</td></tr> </table> <p><b>Short multiplication:</b> <i>Without renaming</i></p> $2 \times 4 = 8$  $2 \times 40 = 80$ 	3 times tables  $3 \times 5 = 15$	4 times tables  $4 \times 5 = 20$	8 times tables  $8 \times 5 = 40$ <small>(doubling the 4 times table)</small>	4 × 4 = 16	4 × 6 = 24	6 × 4 = 24	6 × 6 = 36	4 × 6 = 24	4 × 4 = 16	6 × 4 = 24	6 × 6 = 36	1	0	1	3	×	3	3	9	3	0	+	3	3	9	<p><b>Array method:</b></p>  $6 \times 3 = 18 \quad \text{OR} \quad 3 \times 6 = 18$ <p><b>Number line method:</b></p>  <p><math>9 \times 4 = 36</math></p> <p><b>Bar model:</b></p> $6 \times 9 = 54$  <p><b>Multiply 3 numbers:</b></p>  $2 \times 5 \times 6 = 10 \times 6 = 60$ <p><b>Multiplying by 10:</b></p> <p>Method 1 30 30 30 30 30 30 30 30 30 30 + 30 ----- 330</p> <p>Method 2 30 30 30 30 30 30 30 30 30 30 + 30 ----- 330</p> <p>Method 3 <math>9 \times 30 = 9 \times 3 \times 10</math> <math>= 9 \times 3 \times 10</math> <math>= 27 \times 10</math> <math>= 27 \text{ tens}</math> <math>= 270</math></p> <p>What is the product of 9 and 30? <math>9 \times 30 = \square</math></p>	<p><b>Array method:</b></p>  $6 \times 3 = 18 \quad \text{OR} \quad 3 \times 6 = 18$ <p><b>Number line method:</b></p>  <p><math>9 \times 4 = 36</math></p> <p><b>Bar model:</b></p> $6 \times 9 = 54$  <p><b>Multiply 3 numbers:</b></p>  $2 \times 5 \times 6 = 10 \times 6 = 60$ <p><b>Multiplying by 10:</b></p> <p>Method 1 30 30 30 30 30 30 30 30 30 30 + 30 ----- 330</p> <p>Method 2 30 30 30 30 30 30 30 30 30 30 + 30 ----- 330</p> <p>Method 3 <math>9 \times 30 = 9 \times 3 \times 10</math> <math>= 9 \times 3 \times 10</math> <math>= 27 \times 10</math> <math>= 27 \text{ tens}</math> <math>= 270</math></p> <p>What is the product of 9 and 30? <math>9 \times 30 = \square</math></p>
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1	0																												
1	3																												
×	3																												
3	9																												
3	0																												
+	3																												
3	9																												

**Abstract calculations:**

**Commutative**

$$3 \times 4 = 12$$

$$4 \times 3 = 12$$

**Multiplying a 2-digit number *without renaming***

	t	o
	3	2
x		3
		6
	9	0
	9	6

**Multiplying a 2-digit number *with renaming***

	t	o
	2	6
x		3
		18
	+	60
		78

**Short multiplication *with renaming***

	h	t	o
		2	3
		4	3
x			8
	3	4	4

**Solving word problems: *Bar model***

There are 28 boys in a group.  
There are 3 times as many girls as there are boys.

32 How many girls are there?      32 How many children are there?

28 + 3 = 84      28 + 84 = 112

There are 84 girls.      There are 112 children altogether.

**Multiplying by 100:**

$$7 \times 300 = \square$$

Method 1  
300  
300  
300  
300  
300  
300  
+ 300  
2100

Method 2  
7 x 3 = 21  
7 x 3 hundreds = 21 hundreds  
7 x 300 = 2100

Method 3  
7 x 300 = 7 x 3 x 100  
= 21 x 100  
= 21 hundred  
= 2100

21 hundreds = 2100

**Multiplying 2 digit by 1-digit number *with renaming***

	2	3	
x		6	
		18	
	+	120	
		138	

2 digit x 1 digit

**Multiplying 3 digit by 1-digit number *with renaming***

	4	7	3
x			2
			6
		9	4
	9	4	6

3 digit x 1 digit

**Multiplying by 100:**

$$7 \times 300 = \square$$

Method 1  
300  
300  
300  
300  
300  
300  
+ 300  
2100

Method 2  
7 x 3 = 21  
7 x 3 hundreds = 21 hundreds  
7 x 300 = 2100

Method 3  
7 x 300 = 7 x 3 x 100  
= 21 x 100  
= 21 hundred  
= 2100

21 hundreds = 2100

**Multiplying a 3 digit by a 2-digit number *with renaming***

Multiply 253 x 17.

	2	5	3
x			17
			1771
	+	2530	
		4301	

	3	2	
	2	5	3
x			7
			1771

