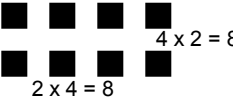


Multiplication Methods

*All of this is reliant on children knowing their **times table facts at fast recall**, as well as their mental methods which are taught alongside this.*

Repeated addition	Array	Scaling																																																																																		
<p>For example: 5 added together 3 times is $5 + 5 + 5$, or lots of 5, or 3 times 5, or 5×3.</p>	<p>Describe an array: for example,</p> <div style="text-align: center;">  </div> <p>Begin to recognise from arranging arrays that multiplication can be done in any order. Use of equipment e.g. counters, cubes used heavily at this stage.</p>	<p>For example:</p> <ul style="list-style-type: none"> • Take the blue ribbon. Find the ribbon that is 4 times as long. • Make a red tower 5 cubes high. Make a blue tower 3 times as high. 																																																																																		
Multiplying digits by 10, 100 and 1000 – Place value (the digits moving to the left)	Use closely related facts	Partitioning																																																																																		
<p>We encourage children to think of the digits moving, rather than saying add a zero, to prepare them when they work with decimals.</p> <p>We often use a place value grid to explain it, saying that the digits move 1 place to the left when multiplying by 10, then a 0 holds the place, 2 places for 100 etc.</p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>U</th> <th>.</th> <th>Ths</th> <th>Hths</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>2</td> <td>3</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>2</td> <td>3</td> <td>0</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>For example $23 \times 10 = 230$, as it moves one place to the left.</p>	Th	H	T	U	.	Ths	Hths			2	3					2	3	0				<p>To multiply a number by 9 or 11, multiply it by 10 and then add or subtract the number.</p> <p>For example:</p> $13 \times 11 = (13 \times 10) + 13$ $= 130 + 13$ $= 143$ $13 \times 9 = (13 \times 10) - 13$ $= 130 - 13$ $= 117$	<p>Begin to multiply a 2 digit number by a single digit number, multiplying the tens first:</p> <p>For example:</p> $32 \times 3 = (30 \times 3) + (2 \times 3)$ $= 90 + 6$ $= 96$																																																													
Th	H	T	U	.	Ths	Hths																																																																														
		2	3																																																																																	
	2	3	0																																																																																	
Grid Method	Expanded Grid Method	Compact method																																																																																		
<p>Children partition numbers and work them out mentally in the organisation of a grid, using previous facts to help them, then add the final result.</p> <p style="text-align: center;">$23 \times 8 =$</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border: 1px solid black; padding: 5px;">x</td> <td style="border: 1px solid black; padding: 5px;">20</td> <td style="border: 1px solid black; padding: 5px;">3</td> <td style="padding: 0 10px;">=</td> <td style="padding: 0 10px;">184</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">8</td> <td style="border: 1px solid black; padding: 5px;">160</td> <td style="border: 1px solid black; padding: 5px;">24</td> <td></td> <td></td> </tr> </table>	x	20	3	=	184	8	160	24			<p>$346 \times 9 =$</p> <div style="text-align: right; margin-right: 50px;"> <table style="border-collapse: collapse;"> <tr> <td></td> <td></td> <td style="text-align: right;">3</td> <td style="text-align: right;">4</td> <td style="text-align: right;">6</td> </tr> <tr> <td></td> <td style="text-align: right;">x</td> <td colspan="3" style="border-top: 1px solid black; border-bottom: 1px solid black;">9</td> </tr> <tr> <td style="text-align: right;">300</td> <td style="text-align: right;">x 9</td> <td style="text-align: right;">2</td> <td style="text-align: right;">7</td> <td style="text-align: right;">0 0</td> </tr> <tr> <td style="text-align: right;">40</td> <td style="text-align: right;">x 9</td> <td style="text-align: right;">3</td> <td style="text-align: right;">6</td> <td style="text-align: right;">0</td> </tr> <tr> <td style="text-align: right;">6</td> <td style="text-align: right;">x 9</td> <td style="text-align: right;">5</td> <td style="text-align: right;">4</td> <td></td> </tr> <tr> <td></td> <td></td> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">3</td> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">1</td> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">1 4</td> </tr> </table> </div>			3	4	6		x	9			300	x 9	2	7	0 0	40	x 9	3	6	0	6	x 9	5	4				3	1	1 4	<p>Children multiply each digit with the bottom unit. Children use carrying, as with addition and put a 0 when working with the tens. Then add both numbers together.</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td></td> <td style="text-align: right;">2</td> <td style="text-align: right;">5</td> <td style="text-align: right;">4</td> <td></td> </tr> <tr> <td></td> <td style="text-align: right;">x</td> <td colspan="3" style="border-top: 1px solid black; border-bottom: 1px solid black;">2 4</td> <td></td> </tr> <tr> <td style="text-align: right;">1</td> <td style="text-align: right;">x</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1</td> <td style="text-align: right;">6</td> <td style="text-align: right;">(x by 4)</td> </tr> <tr> <td style="text-align: right;">+</td> <td></td> <td style="text-align: right;">2</td> <td style="text-align: right;">1</td> <td></td> <td style="text-align: right;">Carried tens</td> </tr> <tr> <td></td> <td></td> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">5</td> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">0</td> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">8 0</td> <td style="text-align: right;">(x by 2)</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">1</td> <td></td> <td></td> <td style="text-align: right;">Carried tens</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">6</td> <td style="text-align: right;">0</td> <td style="text-align: right;">9 6</td> <td style="text-align: right;">Add both answers</td> </tr> </table>			2	5	4			x	2 4				1	x	0	1	6	(x by 4)	+		2	1		Carried tens			5	0	8 0	(x by 2)			1			Carried tens			6	0	9 6	Add both answers
x	20	3	=	184																																																																																
8	160	24																																																																																		
		3	4	6																																																																																
	x	9																																																																																		
300	x 9	2	7	0 0																																																																																
40	x 9	3	6	0																																																																																
6	x 9	5	4																																																																																	
		3	1	1 4																																																																																
		2	5	4																																																																																
	x	2 4																																																																																		
1	x	0	1	6	(x by 4)																																																																															
+		2	1		Carried tens																																																																															
		5	0	8 0	(x by 2)																																																																															
		1			Carried tens																																																																															
		6	0	9 6	Add both answers																																																																															
<p>Vocabulary: Times by, multiples, factor, multiply, multiplication, array, groups of, lots of, packs of</p>																																																																																				