



Abbey Primary School Written Calculation Policy-Multiplication

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths NC 2014									
1		add, groups, equal, how many groups of the same number? counting in 2s	<p>Mostly pictorial representations:</p>  <p>How many groups of 2 are there?</p> <p>Use of concrete apparatus for the children to physically count and see.</p>	<p>Much of it comes in the form of repeated addition of small groups of numbers.</p> <p>Resources Counters, Small toys, Buttons, Cubes, Pegs Pairs of socks, Fingers Songs, whiteboards</p>	BM Steps 1 - 4									
2	I have 3 pairs of shoes - how many shoes do I have altogether?	Count on, counting in 2s,5s,10s, groups of, lots of, how many altogether? total,	<p>Mostly pictorial representations:</p>  <p>2 + 2 + 2 3 groups of 2 3 x 2</p> <p>Number tracks to count up on:</p> <table border="1" data-bbox="869 1093 1281 1141"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td> </tr> </table> <p>Counting up in 2s</p>	1	2	3	4	5	6	7	8	9	<p>At this stage the children will still be doing a lot of concrete work and may also still use pictorial representations. Again, their experience of 'multiplication' still has many connections to repeated addition.</p> <p>Resources Counters, Small toys, Buttons, Cubes, Pegs Pairs of socks, Fingers Songs, whiteboards</p>	BM Steps 1 - 4
1	2	3	4	5	6	7	8	9						

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths NC 2014								
3	<p>What is six lots of 2?</p> <p>5 multiplied by 2 is ...</p> <p>How many wheels are there on 3 cars?</p>	<p>lots of, groups of x, times, multiply, multiplied by, multiple of, once, twice, three times etc.. repeated addition, array row, column, double, group in pairs, threes... tens</p>	<p>Describing arrays:</p> <p>□ □ □ □ □ □ □ □ $4 \times 2 = 8$</p> <p>$2 \times 4 = 8$</p> <p>Repeated addition: $5 + 5 + 5 = 3$ lots of 5 OR 3 times 5 = (3×5) OR (5×3)</p>	<p>Children will still use many ideas from above. They should be introduced to the 'x' symbol for multiplication.</p> <p>Resources Counters etc, Numicon, number lines, number grids, coins,</p>	BM Steps 5 - 8								
4	<p>What is twice 16?</p> <p>What is the product of 15 and 6?</p> <p>9 multiplied by 3.</p>	<p>lots of, groups of x, times, multiply, multiplied by, multiple of, once, twice, three times etc.. repeated addition, array, row, column, double, group in pairs, threes... tens, multiplication, product</p>	<p>Grid method (TU x U) (partitioning):</p> <p>$23 \times 8 =$</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: center;">20</td> <td style="text-align: center;">3</td> <td></td> </tr> <tr> <td style="text-align: right;">8</td> <td style="border: 1px solid black; padding: 2px;">160</td> <td style="border: 1px solid black; padding: 2px;">24</td> <td style="text-align: left;">= 184</td> </tr> </table> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><i>Encourage children to make estimations first using rounding ie $20 \times 8 = 160$ so my answer will be more than this.</i></p> </div>		20	3		8	160	24	= 184	<p>Children should use doubling strategies and place value facts to help multiply by 10 or 100. Calculations can be done with either least or most significant digit first)</p> <p>Resources Numicon, place value counters, Dienes, number lines, number grids, coins,</p>	BM Steps 9 - 14
	20	3											
8	160	24	= 184										

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths NC 2014																												
5	<p>Double 32.</p> <p>What is the product of 25 and 4?</p> <p>Multiply 31 by 8.</p> <p>Calculate 345 x 9</p>	lots of, groups of x, times, multiply, multiplied by, multiple of, once, twice, three times etc.. repeated addition, array, row, column, double, group in pairs, threes... tens, multiplication, product	<p>Grid method (HTU x U and TU x U)</p> <p>e.g. $223 \times 8 =$</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border: none;"></td> <td style="border: none; text-align: center;">200</td> <td style="border: none; text-align: center;">20</td> <td style="border: none; text-align: center;">3</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none; text-align: right;">8</td> <td style="border: 1px solid black; text-align: center;">1600</td> <td style="border: 1px solid black; text-align: center;">160</td> <td style="border: 1px solid black; text-align: center;">24</td> <td style="border: none;">= 1784</td> </tr> </table> <p>Leading to short multiplication (use place value equipment to support understanding)</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border: none; text-align: right;">223</td> <td style="border: none;"></td> <td style="border: none; text-align: right;">223</td> </tr> <tr> <td style="border: none; text-align: right;">x 8</td> <td style="border: none;"></td> <td style="border: none; text-align: right;">X 8</td> </tr> <tr> <td style="border: none; text-align: right;">24</td> <td style="border: none;"></td> <td style="border: none; text-align: right;">1784</td> </tr> <tr> <td style="border: none; text-align: right;">160</td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> <tr> <td style="border: none; text-align: right;">1600</td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> <tr> <td style="border: none; text-align: right;">1784</td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> </table> <div style="border: 1px solid black; padding: 5px; margin-top: 10px; width: fit-content; margin-left: auto; margin-right: auto;"> <p><i>Encourage children to make estimations first using rounding ie $220 \times 8 = 1760$ so my answer will be slightly more than this.</i></p> </div>		200	20	3		8	1600	160	24	= 1784	223		223	x 8		X 8	24		1784	160			1600			1784			<p>Children use the same methods as above. However children should now use the least significant digit first (inline with addition policy). They should be carrying the following types of calculation: HTU x U.</p> <p>Resources Dienes, place value counters.</p>	BM Steps 9 - 15
	200	20	3																														
8	1600	160	24	= 1784																													
223		223																															
x 8		X 8																															
24		1784																															
160																																	
1600																																	
1784																																	
6	<p>Double 75.</p> <p>What is the product of 125 and 4?</p> <p>Calculate 4346 x 9</p>	lots of, groups of x, times, multiply, multiplied by, multiple of, once, twice, three times etc.. repeated addition, array, row, column, double, group in pairs, threes... tens, product multiplication,	<p>Grid method (ThHTU x U; HTU x TU; TU x TU)</p> <p>$72 \times 38 =$ 70 2</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border: none; text-align: right;">30</td> <td style="border: 1px solid black; text-align: center;">2100</td> <td style="border: 1px solid black; text-align: center;">60</td> <td style="border: none;">= 2160</td> </tr> <tr> <td style="border: none; text-align: right;">8</td> <td style="border: 1px solid black; text-align: center;">560</td> <td style="border: 1px solid black; text-align: center;">16</td> <td style="border: none;">= <u>576</u></td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;">2736</td> </tr> </table> <p>Leading to: Long Multiplication:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border: none; text-align: right;">72</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none; text-align: right;">x 38</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none; text-align: right;">576</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none; text-align: right;">2160</td> <td style="border: none;"></td> </tr> </table>	30	2100	60	= 2160	8	560	16	= <u>576</u>				2736	72		x 38		576		2160		<p>Children in Year 6 should use the methods as those in Year 5 continuing to use least significant digit first (inline with addition policy)</p> <p>Children should be extended to working with ThHTU x U and TU x TU, HTU x TU.</p> <p><i>Continue to develop skills in estimation.</i></p>	BM Steps 16 - 19								
30	2100	60	= 2160																														
8	560	16	= <u>576</u>																														
			2736																														
72																																	
x 38																																	
576																																	
2160																																	

			2 7 3 6		
--	--	--	---------	--	--

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths NC 2014										
7			<p>Extend to using short multiplication and long multiplication for decimals (could use the grid to reinforce place value as a teaching tool)</p> <p>$12.62 \times 8 =$</p> <table border="1" style="display: inline-table; margin-left: 20px;"> <tr> <td></td> <td style="text-align: center;">10</td> <td style="text-align: center;">2</td> <td style="text-align: center;">0.6</td> <td style="text-align: center;">0.02</td> </tr> <tr> <td style="text-align: right;">8</td> <td style="text-align: center;">80</td> <td style="text-align: center;">16</td> <td style="text-align: center;">4.8</td> <td style="text-align: center;">0.16</td> </tr> </table> <p style="margin-left: 20px;">$= 80 + 16 + 4.8 + 0.16 = 100.96$</p> <p>short multiplication</p> $\begin{array}{r} 12.62 \\ \times \quad 8 \\ \hline 100.96 \\ \small{241} \end{array}$ <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><i>Encourage children to make estimations first using rounding ie $12 \times 8 = 96$ and $13 \times 8 = 104$ so my answer will in between these and will have two decimal places.</i></p> </div> <p>Long Multiplication:</p> $\begin{array}{r} 7.2 \\ \times \quad 38 \\ \hline 57.6 \\ \small{+} \\ \hline 216.0 \\ \hline 273.6 \end{array}$		10	2	0.6	0.02	8	80	16	4.8	0.16	<p>Extend these ideas to working with decimals.</p> <p><i>Continue to develop skills in estimation.</i></p> <p>Multiply decimal numbers with up to 2 decimal places by a single or two-digit number.</p>	
	10	2	0.6	0.02											
8	80	16	4.8	0.16											

