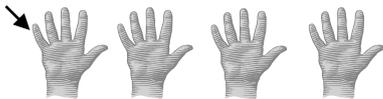
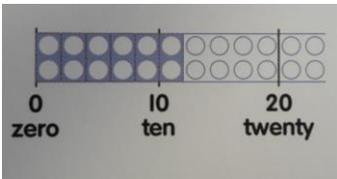
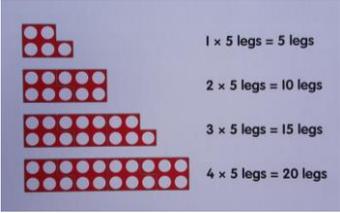
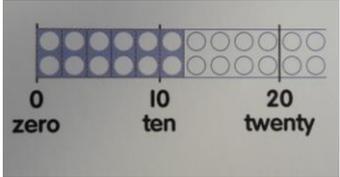
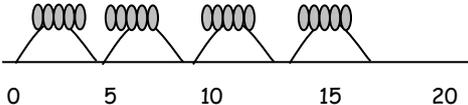
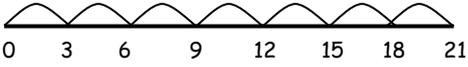
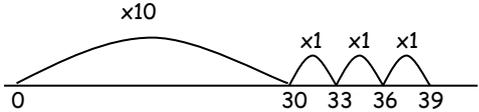


MULTIPLICATION STRATEGIES

	Strategy	Key concepts and resources
<p>Foundation Stage</p> <p><i>Aim by end of year:</i></p> <ul style="list-style-type: none"> - All can count in 2s, 5s and 10s and solve practical problems in a real or role play context, including doubling, halving and sharing. 	<p>Solve practical problems in a real or role play context</p> <p>e.g. Put 5 cherries on each cake. How many cherries do you need?</p> <p>Oral counting in twos, fives and tens. Count repeated groups of the same size. Exploring repeating patterns of Numicon shapes, eg. through printing in playdough, printing with paint etc.</p> 	<p>Sing songs counting in 2s, 5s etc, eg. Mr Double Trouble.</p> <p>Key resources: Practical objects for counting eg cubes, sweets. Numicon shapes Numicon pegs and baseboards Numicon IWB software Numicon tens number line</p>
<p>Year 1</p> <p><i>Aim by end of year:</i></p> <ul style="list-style-type: none"> - Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. 	<p>Solve practical problems that involve repeated addition of groups of 2, 5 and 10 using practical apparatus, pictures and symbols, inc. Numicon pegs on baseboards and moving to Numicon shapes.</p> <p>e.g. How many fingers are there on 4 hands?</p>  <p>Exploring repeated addition using Numicon shapes</p>  <p>Moving to putting shapes together horizontally along a tens line.</p>  <p>Count in 2s, 5s and 10s to derive the multiples of 2, 5 and 10.</p>	<p>Sing songs counting in 2s, 5s etc.</p> <p>Key resources: Practical objects for counting and practical problems. Number lines Hundred squares Counting sticks Bead strings Numicon shapes Numicon pegs and baseboards Numicon IWB software Numicon tens number line</p>
<p>Year 2</p> <p><i>Aim by end of year:</i></p> <ul style="list-style-type: none"> - recall and use multiplication and division facts for the 2, 5 and 10 	<p>Understand multiplication as repeated addition, using pictures, symbols, arrays and number lines to reinforce, with Numicon being used as the primary resource.</p> <p>e.g. There are 5 pencils in one packet, how many pencils in 4 packets?</p>	<p>Continue to relate to real life contexts and make links between arrays and number lines.</p> <p>Key resources:</p>

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<p><i>multiplication tables, including recognising odd and even numbers</i></p> <p>- <i>calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs</i></p> <p>- <i>show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</i></p> <p>- <i>solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.</i></p>	<p> = $5+5+5+5$ or 4 lots of 5 or 4×5</p> <p>This can also be shown as repeated jumps on a number line, modelled using a Numicon tens number line (or bead string), and by marking the jumps on a hundred square.</p> <p>Moving to putting shapes together horizontally with, and without, a tens line.</p>    <p>Understand multiplication as describing an array.</p> <p>..... $5 \times 4 = 20$ (explained as 5 four times) $4 \times 5 = 20$ (explained as 4 five times)</p>	<p>Practical objects for counting</p> <p>Number lines</p> <p>Hundred squares</p> <p>Counting sticks</p> <p>Bead strings</p> <p>Numicon shapes</p> <p>Numicon pegs and baseboards</p> <p>Numicon IWB software</p> <p>Numicon tens number line</p>
<p>Year 3</p> <p><u>Aim by end of year:</u></p> <ul style="list-style-type: none"> recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to 	<p>Understand multiplication as:</p> <p>repeated addition</p>  <p>Leading to:</p> <p>13×3</p>  <p>describing an array</p> <p>..... 13×3</p>	<p>To provide the children with skills for Y4 written approaches, the objective 'Use knowledge of number facts and place value to multiply or divide mentally' is important i.e.</p> <ul style="list-style-type: none"> Know 2x, 3x, 4x 5x, 6x, 10x times tables (by the end of the year) recognise multiples of 2, 5 and 10 up to 1000 count in steps of 2,3,4,5, 6, 8 and 10 multiply a single digit by 1,10 or 100. divide a three digit multiple of 100 by 10 or 100. double any multiple of 5 up to 50. halve any multiple of 10 to 100. multiply a 2-digit multiple of 10 up

MULTIPLICATION STRATEGIES

<p><i>formal written methods</i></p>	<p>..... = $10 \times 3 + 3 \times 3$ = $30 + 9 = 39$</p> <p>scaling e.g. Make a tower 3 times taller than this. Draw a line 4 times longer than this.</p>	<p>to 50, by 2, 3, 4, 5 or 10. multiply a 2-digit number by 2, 3, 4 or 5 without crossing tens boundary (e.g. 23×3 using partitioning)</p> <p>Key resources: Place value sliders Number lines Hundred squares Counting sticks Bead strings</p>
	<p>Develop informal written methods through partitioning and grid method. Begin with 'teens' numbers e.g. 13×8, then progress on to multiples of ten e.g. 23×8 (approx. answer - between 160 and 200)</p> <p>Partitioning</p> $ \begin{array}{r} 23 \times 8 \\ \swarrow \quad \searrow \\ 20 \times 8 = 160 \quad 3 \times 8 = 24 \\ \\ 23 \times 8 = 160 + 24 = 184 \end{array} $ <p>and</p> <p>Grid method</p> $ \begin{array}{r} \times \quad 20 \quad 3 \\ 8 \quad \boxed{160} \quad \boxed{24} \quad = 184 \end{array} $ <p>$23 \times 8 = 184$</p>	<p>It is important that children are taught to <u>always approximate first</u> in order to get a sensible idea of what the answer must be.</p> <p>Key resources: Laminated grids for grid method Grid whiteboards Place value cards Place value sliders Place value counters Base 10 blocks</p>
<p>Year 4 Aim by end of year:</p> <ul style="list-style-type: none"> ▪ recall multiplication and division facts for multiplication tables up to 12×12 ▪ use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers ▪ recognise and use factor pairs and commutativity in mental calculations ▪ multiply two-digit and three-digit 	<p>Continue to use informal methods as in Year 3 to support mental working and understanding of multiplication.</p> <p>Partitioning</p> $ \begin{array}{r} 23 \times 8 \\ \swarrow \quad \searrow \\ 20 \times 8 = 160 \quad 3 \times 8 = 24 \\ \\ 23 \times 8 = 160 + 24 = 184 \end{array} $ <p>Grid method (see Framework- Section 6 p66 - Method A)</p> $ \begin{array}{r} \times \quad 300 \quad 20 \quad 3 \\ 8 \quad \boxed{2400} \quad \boxed{160} \quad \boxed{24} \quad = 2584 \end{array} $ <p>$323 \times 8 = 2584$</p> <p>Progress to vertical expanded recording, multiplying by the least significant digit first.</p> <p>Record like this: 23×7 approx. ans. - bit larger than 140</p> $ \begin{array}{r} 23 \\ \times \underline{7} \end{array} $	<p>It is important that children are taught to <u>always approximate first</u> in order to get a sensible idea of what the answer must be.</p> <p>Key resources: Laminated grids for grid method Grid whiteboards Place value cards Place value sliders Place value counters Base 10 blocks</p> <p>Children should understand the importance of lining up digits (squared paper, whiteboards and IWB backgrounds should be used to reinforce this) and starting with least significant digit first.</p>

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<p><i>numbers by a one-digit number using formal written layout</i></p>	<p>21 (3 × 7) $\frac{140}{161}$ (20 × 7)</p> <p>Moving to compact multiplication when ready.</p> $\begin{array}{r} 342 \\ \times 6 \\ \hline 12 \text{ (2 × 6)} \\ 240 \text{ (40 × 6)} \\ \hline 1800 \text{ (300 × 6)} \\ 2052 \end{array}$ $\begin{array}{r} 342 \\ \times 6 \\ \hline 2052 \\ 21 \end{array}$																					
<p>Year 5 <i>Aim by end of year:</i></p> <ul style="list-style-type: none"> - <i>multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers</i> - <i>multiply and divide numbers mentally drawing upon known facts</i> - <i>multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</i> 	<p>Continue to use informal methods of recording to support and explain mental methods where the numbers are appropriate.</p> <p>It is important to ensure that children continue to use informal methods of recording to support and explain their mental methods where the numbers are appropriate</p> <p>Including 'grid' method. E.g. 72 × 38 ans. approx. 70 × 40 = 2800</p> <table border="1" data-bbox="427 920 711 1108"> <tr> <td>x</td> <td>70</td> <td>2</td> <td></td> </tr> <tr> <td>30</td> <td>2100</td> <td>60</td> <td></td> </tr> <tr> <td>8</td> <td>560</td> <td>16</td> <td></td> </tr> </table> $\begin{array}{r} 2160 \\ + 576 \\ \hline 2736 \end{array}$ <p>4.9 × 3</p> <table border="1" data-bbox="504 1218 699 1290"> <tr> <td>x</td> <td>4</td> <td>0.9</td> <td></td> </tr> <tr> <td>3</td> <td>12</td> <td>2.7</td> <td></td> </tr> </table> $12 + 2.7 = 14.7$	x	70	2		30	2100	60		8	560	16		x	4	0.9		3	12	2.7		<p>Key resources:</p> <p>Laminated grids for grid method Grid whiteboards Place value cards Place value sliders Place value counters Base 10 blocks</p>
x	70	2																				
30	2100	60																				
8	560	16																				
x	4	0.9																				
3	12	2.7																				
	<p>Continue to develop formal long multiplication.</p> <p>Expanded long multiplication</p> $\begin{array}{r} 72 \\ \times 38 \\ \hline 16 \text{ (8×2)} \\ 560 \text{ (70 × 8)} \\ 60 \text{ (2 × 30)} \\ \hline 2100 \text{ (70 × 30)} \\ 2736 \\ 1 \end{array}$ <p>Moving to compact long multiplication</p> $\begin{array}{r} 72 \\ \times 38 \\ \hline 576 \text{ (72 × 8)} \\ 1 \\ \hline 2160 \text{ (72 × 30)} \\ 2736 \end{array}$ <p>Extending to compact long multiplication with larger numbers</p> <p>124</p>	<p>Children should understand the importance of lining up units digits under units digits, tens under tens etc (squared paper, whiteboards and IWB backgrounds should be used to reinforce this) and starting with least significant digit first.</p>																				

MULTIPLICATION STRATEGIES

	$\begin{array}{r} \times 26 \\ 744 \text{ (124} \times 6) \\ 12 \\ \hline 2480 \text{ (124} \times 20) \\ 3224 \\ 11 \\ \hline \end{array}$ <p>The prompts in brackets can be omitted when children no longer need them.</p>																															
<p>Year 6 <u>Aim by the end of Year 6:</u></p> <ul style="list-style-type: none"> multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication 	<p>Continue to use and develop 'grid' method in order to support pupils mental workings and understanding of multiplication.</p> <p>372×24</p> <table border="1" data-bbox="395 730 743 837"> <tbody> <tr> <td>x</td> <td>300</td> <td>70</td> <td>2</td> <td></td> </tr> <tr> <td>20</td> <td>6000</td> <td>1400</td> <td>40</td> <td>= 7440</td> </tr> <tr> <td>4</td> <td>1200</td> <td>280</td> <td>8</td> <td>= 1488 +</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>8928</td> </tr> </tbody> </table> <p>Extend to decimals, with up to 2-decimal places, multiplied by a single digit e.g. 4.92×3 (answer approx: 15)</p> <table border="1" data-bbox="408 987 718 1117"> <tbody> <tr> <td>x</td> <td>4</td> <td>0.9</td> <td>0.02</td> <td></td> </tr> <tr> <td>3</td> <td>12</td> <td>2.7</td> <td>0.06</td> <td>= 14.76</td> </tr> </tbody> </table> <p>$= 12 + 2.7 + 0.06 = 14.76$</p>	x	300	70	2		20	6000	1400	40	= 7440	4	1200	280	8	= 1488 +					8928	x	4	0.9	0.02		3	12	2.7	0.06	= 14.76	<p>Children should understand the importance of lining up units digits under units digits, tens under tens etc (squared paper, whiteboards and IWB backgrounds should be used to reinforce this) and starting with least significant digit first.</p> <p>Key resources: Laminated grids for grid method Grid whiteboards Place value cards</p>
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	<p>Continue to develop formal long multiplication as in Year 5.</p> $\begin{array}{r} 372 \\ \times 24 \\ \hline 1488 \text{ (372} \times 4) \\ 7740 \text{ (372} \times 20) \\ \hline 8928 \end{array}$ $\begin{array}{r} 53.2 \\ \times 24.0 \\ \hline 212.8 \text{ (53.2} \times 4) \\ 1 \\ \hline 1064.0 \text{ (53.2} \times 20) \\ 1276.8 \end{array}$	<p>Children should understand the importance of lining up units digits under units digits, tens under tens etc (squared paper, whiteboards and IWB backgrounds should be used to reinforce this) and starting with least significant digit first.</p>																														