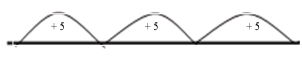
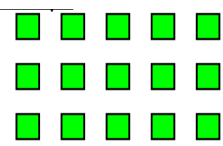

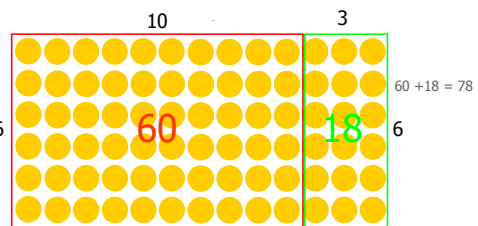
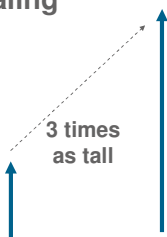


St Marys C.E.(A) Primary School, Mucklestone
Progression in Multiplication
Be National Curriculum 2014 ready

Year	What will multiplication look like?	Notes						
		The guidance in italics is taken from the non-statutory guidance in the 'National Curriculum in England' document for 2014						
EYFS	Jumping along number lines in steps of... 100 square to look at patterns of multiples. Grouping- counting in equal sized groups.							
1	Pupils solve one-step problems involving multiplication by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	<i>They make connections between arrays, number patterns, and counting in twos, fives and tens.</i>						
2	<p>Pupils calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals ($=$) signs $2 \times 5 = 10$ $12 = 4 \times 3$</p> <p>Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts, e.g.</p> <p>3 friends have 5 pencils each. How many pencils do they have altogether?</p>  <p>$5 \times 3 =$ '5 multiplied by 3' or '5 times 3' or '5, three times'</p> 	<p><i>Pupils use a variety of language to describe multiplication and division.</i></p> <p><i>Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations.</i></p> <p><i>Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, $40 \div 2 = 20$, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, $4 \times 5 = 20$ and $20 \div 5 = 4$).</i></p>						
3	<p>Build on their understanding of repeated addition and arrays to multiply two digits by one digit using tables they know, e.g. 13×3</p>  <p>Informal recording of partitioned numbers, $15 \times 5 = 10 \times 5$ and 5×5 or $10 \times 5 + 5 \times 5$</p> <p>Link arrays to introduce grid multiplication to multiply TU by U, e.g. 13×6</p>  <p>$13 \times 6 = 78$</p> <p>Use grid method to multiply TU by U, progressing to formal written methods when appropriate (see year 4)</p> <table border="1" data-bbox="295 1814 710 1881"> <tr> <td>\times</td> <td>20</td> <td>3</td> </tr> <tr> <td>4</td> <td>80</td> <td>12</td> </tr> </table> <p>= 92</p>	\times	20	3	4	80	12	<p><i>Pupils continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 multiplication tables.</i></p> <p><i>Pupils develop efficient mental methods, for example, using commutativity and associativity (for example, $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$) and multiplication and division facts (for example, using $3 \times 2 = 6$, $6 \div 3 = 2$ and $2 = 6 \div 3$) to derive related facts (for example, $30 \times 2 = 60$, $60 \div 3 = 20$ and $20 = 60 \div 3$).</i></p> <p><i>Pupils develop reliable written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication and division.</i></p> <p><i>Pupils solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits?)</i></p>
\times	20	3						
4	80	12						

	<p>Scaling</p>  <p>Relate multiplication to scaling. My string is 12cm long. Cut a piece of string three times longer.</p>																	
<p>4</p>	<p>Pupils multiply two-digit and three-digit numbers by a one-digit number using formal written layout</p> <p>_____</p> <p>HTU x U using grid method, e.g. 136 x 5</p> <table border="1" data-bbox="300 835 657 893"> <tr> <td>x</td> <td>100</td> <td>30</td> <td>6</td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> </tr> </table> <p>Progressing to the expanded short multiplication method (least significant digit first)</p> $\begin{array}{r} 136 \\ \times 5 \\ \hline 30 \\ 150 \\ \hline 500 \\ \hline 680 \end{array}$ <p>Moving to the formal written method.</p> $\begin{array}{r} 136 \\ \times 5 \\ \hline 680 \\ 13 \end{array}$	x	100	30	6	5				<p><i>Pupils continue to practise recalling and using multiplication tables and related division facts to aid fluency.</i></p> <p><i>Pupils practise mental methods and extend this to three-digit numbers to derive facts, (for example $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$).</i></p> <p><i>Pupils practise to become fluent in the formal written method of short multiplication.</i></p> <p><i>Pupils write statements about the equality of expressions (for example, use the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and associative law $(2 \times 3) \times 4 = 2 \times (3 \times 4)$). They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, $2 \times 6 \times 5 = 10 \times 6 = 60$.</i></p>								
x	100	30	6															
5																		
<p>5</p>	<p>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</p> <p>Multiply ThHTU x U using the formal written method,,e.g. 1345 x 6</p> $\begin{array}{r} 1345 \\ \times 6 \\ \hline 8070 \\ \hline 223 \end{array}$ <p>Multiply TU x TU using the grid method, e.g. 38 x 72</p> <table border="1" data-bbox="228 1655 691 1872"> <tr> <td>x</td> <td>30</td> <td>8</td> <td></td> </tr> <tr> <td>70</td> <td>2100</td> <td>560</td> <td>= 2660 +</td> </tr> <tr> <td>2</td> <td>60</td> <td>16</td> <td>= 76</td> </tr> <tr> <td></td> <td></td> <td></td> <td>2736</td> </tr> </table> <p>Progressing to the expanded written form for TU x TU</p> $\begin{array}{r} 72 \\ \times 38 \\ \hline 16 \text{ (2 X 8)} \\ 560 \text{ (70 X 8)} \\ 60 \text{ (2 X 30)} \\ \hline 2100 \text{ (70 X 30)} \\ \hline 2736 \end{array}$	x	30	8		70	2100	560	= 2660 +	2	60	16	= 76				2736	<p><i>Pupils practise and extend their use of the formal written methods of short multiplication.</i></p> <p><i>They apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations.</i></p> <p><i>They use and understand the terms factor, multiple and prime, square and cube numbers.</i></p> <p><i>Pupils use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and metres.</i></p>
x	30	8																
70	2100	560	= 2660 +															
2	60	16	= 76															
			2736															

	Extending to the formal written method of long multiplication (see Year 6)				
6	<p>Pupils multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication</p> <p>Long multiplication</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; border-right: 1px solid black; padding: 5px;"> $\begin{array}{r} 24 \times 16 \text{ becomes} \\ \begin{array}{r} 2 \\ 2 4 \\ \times 1 6 \\ \hline 2 4 0 \\ 1 4 4 \\ \hline 3 8 4 \end{array} \end{array}$ <p>Answer: 384</p> </td> <td style="width: 33%; border-right: 1px solid black; padding: 5px;"> $\begin{array}{r} 124 \times 26 \text{ becomes} \\ \begin{array}{r} 1 2 4 \\ 1 2 4 \\ \times 2 6 \\ \hline 2 4 8 0 \\ 7 4 4 \\ \hline 3 2 2 4 \\ 1 1 \end{array} \end{array}$ <p>Answer: 3224</p> </td> <td style="width: 33%; padding: 5px;"> $\begin{array}{r} 124 \times 26 \text{ becomes} \\ \begin{array}{r} 1 2 4 \\ 1 2 4 \\ \times 2 6 \\ \hline 7 4 4 \\ 2 4 8 0 \\ \hline 3 2 2 4 \\ 1 1 \end{array} \end{array}$ <p>Answer: 3224</p> </td> </tr> </table>	$ \begin{array}{r} 24 \times 16 \text{ becomes} \\ \begin{array}{r} 2 \\ 2 4 \\ \times 1 6 \\ \hline 2 4 0 \\ 1 4 4 \\ \hline 3 8 4 \end{array} \end{array} $ <p>Answer: 384</p>	$ \begin{array}{r} 124 \times 26 \text{ becomes} \\ \begin{array}{r} 1 2 4 \\ 1 2 4 \\ \times 2 6 \\ \hline 2 4 8 0 \\ 7 4 4 \\ \hline 3 2 2 4 \\ 1 1 \end{array} \end{array} $ <p>Answer: 3224</p>	$ \begin{array}{r} 124 \times 26 \text{ becomes} \\ \begin{array}{r} 1 2 4 \\ 1 2 4 \\ \times 2 6 \\ \hline 7 4 4 \\ 2 4 8 0 \\ \hline 3 2 2 4 \\ 1 1 \end{array} \end{array} $ <p>Answer: 3224</p>	<p><i>Pupils practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of columnar addition and subtraction, short and long multiplication</i></p> <p><i>They undertake mental calculations with increasingly large numbers and more complex calculations.</i></p> <p><i>Pupils continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency.</i></p>
$ \begin{array}{r} 24 \times 16 \text{ becomes} \\ \begin{array}{r} 2 \\ 2 4 \\ \times 1 6 \\ \hline 2 4 0 \\ 1 4 4 \\ \hline 3 8 4 \end{array} \end{array} $ <p>Answer: 384</p>	$ \begin{array}{r} 124 \times 26 \text{ becomes} \\ \begin{array}{r} 1 2 4 \\ 1 2 4 \\ \times 2 6 \\ \hline 2 4 8 0 \\ 7 4 4 \\ \hline 3 2 2 4 \\ 1 1 \end{array} \end{array} $ <p>Answer: 3224</p>	$ \begin{array}{r} 124 \times 26 \text{ becomes} \\ \begin{array}{r} 1 2 4 \\ 1 2 4 \\ \times 2 6 \\ \hline 7 4 4 \\ 2 4 8 0 \\ \hline 3 2 2 4 \\ 1 1 \end{array} \end{array} $ <p>Answer: 3224</p>			