



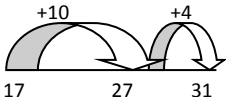
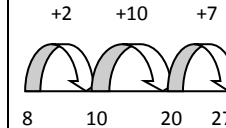
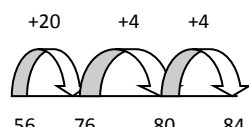
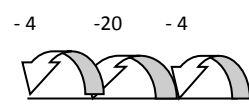
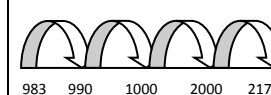
Frithwood Primary School Progression of Calculation Policy

	Stage 1	Stage 2	Stage 3 (yr 2)	Stage 4	Stage 5	Stage 6	Stage 7																																
<div style="font-size: 48px; font-weight: bold; margin-bottom: 10px;">X</div> <p>Multiplication</p>	<p>Working at a practical level to gain experience of doubling and become familiar with appropriate language e.g. counting the number of eyes, ears on faces (1 face has 2 eyes, 2 faces will have 4 eyes)</p>	<p>Know by heart all addition doubles to at least 5</p> <p>Experience doubles to at least 10 and corresponding halves</p> <p>Using the vocabulary associated with multiplication</p> <p>Using informal jottings of groupings</p>	<p>Know by heart the multiplication facts for the 10 and 2 multiplication tables</p> <p>Using arrays to make informal jottings, to multiply e.g. 3 x 2 <div style="display: flex; justify-content: space-around; margin-top: 5px;"> ○ ○ ○ ○ ○ ○ </div> </p> <p>Using a number line to make informal jottings, to multiply by repeated addition <i>Record numbers as add, below the number line</i> e.g. $4 \times 5 = (5 + 5 + 5 + 5)$</p> <p style="text-align: center;">5 5 5 5</p> 	<p>Know by heart the multiplication facts for 10, 2, 5, 3 and 4 tables</p> <p>Explain the effect of multiplying by 10</p> <p>Mental methods using partitioning $38 \times 7 = (30 \times 7) + (8 \times 7)$</p> <p>Using the grid method to multiply TU x U <i>Partition number, multiply and total</i> e.g. 38×7</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr><td>X</td><td>30</td><td>8</td><td></td></tr> <tr><td>7</td><td>210</td><td>56</td><td>210</td></tr> <tr><td></td><td></td><td></td><td><u>56</u></td></tr> <tr><td></td><td></td><td></td><td>266</td></tr> </table>	X	30	8		7	210	56	210				<u>56</u>				266	<p>Know by heart the multiplication facts up to the 12 tables</p> <p>Explain the effect of multiplying by 100, 1000 etc</p> <p>Using the grid method to multiply TU x TU</p> <p>e.g. 56×27</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr><td>X</td><td>50</td><td>6</td><td></td></tr> <tr><td>²⁰</td><td>100</td><td>12</td><td>1120</td></tr> <tr><td>7</td><td>350</td><td>42</td><td><u>392</u></td></tr> <tr><td></td><td></td><td></td><td>1512</td></tr> </table>	X	50	6		²⁰	100	12	1120	7	350	42	<u>392</u>				1512	<p>Know by heart the square number facts up to 12</p> <p>Using expanded column method, multiplying TU x U</p> <p>e.g. 38×7</p> $\begin{array}{r} 38 \\ \times 7 \\ \hline 56 \quad (8 \times 7) \\ 210 \quad (30 \times 7) \\ \hline 266 \end{array}$ <p>Moving onto using compact column method, to multiply TU x U</p> $\begin{array}{r} 38 \\ \times 7 \\ \hline 266 \\ 5 \end{array}$	<p>Using expanded column method, to multiply TU x TU</p> <p>e.g. 28×35</p> $\begin{array}{r} 28 \\ \times 35 \\ \hline 140 \quad (5 \times 28) \\ 840 \quad (30 \times 28) \\ \hline 980 \end{array}$ <p>Moving onto using column method to multiply decimal numbers</p>
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Understand the relationship between multiplication and division

<div style="font-size: 48px; font-weight: bold; margin-bottom: 10px;">÷</div> <p>Division</p>	<p>Working at a practical level to gain experience of sharing and to become familiar with appropriate language e.g. there are 12 cakes to be shared between 5 children, how many does each child get?</p>	<p>Separate a given number of objects into equal groups and record results informally</p> <p>Use the vocabulary associated with division</p>	<p>Understand division as grouping, repeated subtraction or sharing, and record informally</p> <p>Recall division facts related to multiplication for 2, 5 and 10 tables</p>	<p>Explain the effect of dividing by 10</p> <p>Use the + and = signs recording horizontally</p> <p>Using a number line to make informal jottings, to divide by repeated addition <i>Record numbers as add, below the number line</i> e.g. $12 \div 4 = 4 + 4 + 4$</p> <p>How many 4's in 12?</p>  <p style="text-align: center;">0 4 8 12</p> <p>Moving onto number line for division with remainders</p>	<p>Explain the effect of dividing by 100 and 1000 etc</p> <p>Using chunking method, to divide TU by U <i>Recording multiplication facts</i> e.g. $96 \div 6$</p> $\begin{array}{r} 96 \\ - 60 \quad (10 \times 6) \\ \hline 36 \\ - 36 \quad (6 \times 6) \\ \hline 0 \end{array}$ <p style="text-align: right;">$10 + 6 = 16$</p>	<p>Using chunking method, to divide HTU by U e.g. $196 \div 6$</p> $\begin{array}{r} 196 \\ - 180 \quad (30 \times 6) \\ \hline 16 \\ - 12 \quad (2 \times 6) \\ \hline 4 \end{array}$ <p style="text-align: right;">$30 \quad 2 = 32 \text{ r } 4$</p>	<p>Using 'Bus-stop' method, to divide up to HTU by U <i>List the multiples of the divisor if needed</i> e.g. $427 \div 5$</p> $\begin{array}{r} 85 \text{ r } 2 \\ 5 \overline{) 427} \end{array}$ <p>Using 'Bus-stop' method, to divide up to HTU by U</p> <p>e.g. $817.35 \div 7$</p> $\begin{array}{r} 116.76 \\ 7 \overline{) 817.35} \end{array}$ <p>(Decimal points lined up)</p>
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<div style="font-size: 48px; font-weight: bold;">+</div>	<p>Addition</p> <p>Finding one more than a number from 1 to 10</p> <p>Practical activities and discussions in a real life context, relating to children's experiences e.g. Using two objects, how can I make a given total?</p> <p>Using vocabulary associated with addition</p>	<p>Know by heart all the number bonds to 10 and begin to know to 20</p> <p>Begin to use the + & = signs to record mental calculations</p> <p>Using knowledge to know that addition can be done in any order to do mental calculations more efficiently</p>	<p>Know by heart all number bonds to 20</p> <p>Adding 3 single digit numbers mentally</p> <p>Using + & = to record mental calculations</p> <p>Using a number line to make informal jottings to add U + U, moving onto TU + TU <i>Count on in tens first, then units</i></p> <p>e.g. 17 + 14</p> <div style="text-align: center;">  </div> <p>Use partitioning to reflect mental methods</p> <p>e.g. 47 + 78 = 40 + 70 + 7 + 8</p>	<p>Using informal jottings for larger numbers e.g. number lines, partitioning</p> <p>Using expanded column method, adding TU + TU, moving into HTU <i>Add the units first</i></p> <p>e.g.</p> <div style="text-align: center;"> <table style="margin: auto;"> <tr><td></td><td style="text-align: right;">T U</td></tr> <tr><td></td><td style="text-align: right;">83</td></tr> <tr><td></td><td style="text-align: right;">+ 42</td></tr> <tr><td style="border-top: 1px solid black;"></td><td style="text-align: right;">5</td></tr> <tr><td>(3 + 2)</td><td style="text-align: right;">5</td></tr> <tr><td style="border-top: 1px solid black;">(80 + 40)</td><td style="text-align: right;">120</td></tr> <tr><td style="border-top: 1px solid black;"></td><td style="text-align: right;">125</td></tr> </table> </div>		T U		83		+ 42		5	(3 + 2)	5	(80 + 40)	120		125	<p>Using expanded column method with HTU <i>Largest number at top of calculation</i></p> <p>e.g.</p> <div style="text-align: center;"> <table style="margin: auto;"> <tr><td></td><td style="text-align: right;">HTU</td></tr> <tr><td></td><td style="text-align: right;">493</td></tr> <tr><td></td><td style="text-align: right;">+ 368</td></tr> <tr><td style="border-top: 1px solid black;"></td><td style="text-align: right;">11</td></tr> <tr><td>(8 + 3)</td><td style="text-align: right;">11</td></tr> <tr><td style="border-top: 1px solid black;">(90 + 60)</td><td style="text-align: right;">150</td></tr> <tr><td style="border-top: 1px solid black;">(400 + 300)</td><td style="text-align: right;">700</td></tr> <tr><td style="border-top: 1px solid black;"></td><td style="text-align: right;">861</td></tr> </table> </div>		HTU		493		+ 368		11	(8 + 3)	11	(90 + 60)	150	(400 + 300)	700		861	<p>Using compact column method, adding TU + TU, moving onto HTU + HTU <i>Carry below the line and cross off once added</i></p> <p>e.g.</p> <div style="text-align: center;"> <table style="margin: auto;"> <tr><td></td><td style="text-align: right;">HTU</td></tr> <tr><td></td><td style="text-align: right;">493</td></tr> <tr><td></td><td style="text-align: right;">+ 368</td></tr> <tr><td style="border-top: 1px solid black;"></td><td style="text-align: right;">861</td></tr> </table> </div> <p>Using compact column method, adding decimal numbers with 1 d.p. <i>Line digits up by the decimal point</i> <i>Use '0' as a place holder</i></p> <p>e.g.</p> <div style="text-align: center;"> <table style="margin: auto;"> <tr><td></td><td style="text-align: right;">HTU. t</td></tr> <tr><td></td><td style="text-align: right;">341.6</td></tr> <tr><td></td><td style="text-align: right;">+ 276.0</td></tr> <tr><td style="border-top: 1px solid black;"></td><td style="text-align: right;">617.6</td></tr> </table> </div>		HTU		493		+ 368		861		HTU. t		341.6		+ 276.0		617.6	<p>Using compact column method, adding varied number of digits up to ThTU</p> <div style="text-align: center;"> <table style="margin: auto;"> <tr><td></td><td style="text-align: right;">1234</td></tr> <tr><td></td><td style="text-align: right;">+ 794</td></tr> <tr><td style="border-top: 1px solid black;"></td><td style="text-align: right;">2028</td></tr> </table> </div> <p>Using compact column method, adding decimal numbers with 2 d.p. or more e.g.</p> <div style="text-align: center;"> <table style="margin: auto;"> <tr><td></td><td style="text-align: right;">HTU. t h</td></tr> <tr><td></td><td style="text-align: right;">341.63</td></tr> <tr><td></td><td style="text-align: right;">+ 276.04</td></tr> <tr><td style="border-top: 1px solid black;"></td><td style="text-align: right;">617.67</td></tr> </table> </div>		1234		+ 794		2028		HTU. t h		341.63		+ 276.04		617.67
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<div style="font-size: 48px; font-weight: bold;">-</div>	<p>Subtraction</p> <p>Finding 1 less than a number from 1 to 10</p> <p>Practical activities and discussions e.g. there are 5 starfish on a rock, the tide comes in and washes one away. How many are left?</p> <p>Using vocabulary associated with subtraction</p> <p>Begin to relate subtraction to 'taking away'</p>	<p>Know by heart all the subtraction facts to 10 and begin to know to 20</p> <p>Begin to use the - & = sign to record mental calculations</p>	<p>Know by heart all the subtraction facts to 20</p> <p>Use - & = sign to record mental calculations</p> <p>Using a number line to make informal jottings to find a small difference TU- U by counting on <i>Bridging to the nearest multiple of ten</i></p> <p>e.g. 27 - 8 = 19</p> <div style="text-align: center;">  </div>	<p>Using a number line to subtract TU - TU by counting on and back <i>Bridging to nearest multiple of ten or counting in tens first</i></p> <p>e.g. 84 - 56 = 28</p> <div style="text-align: center;">  </div> <p>Or</p> <div style="text-align: center;">  </div>	<p>Using a number line to subtract up to ThHTU - ThHTU by counting on or back e.g. 2174 - 983</p> <div style="text-align: center;">  </div> <p>Using compact column method, subtracting up to HTU - HTU <i>Largest number at top of calculation</i></p> <p>e.g. 78 - 46</p> <div style="text-align: center;"> <table style="margin: auto;"> <tr><td></td><td style="text-align: right;">TU</td></tr> <tr><td></td><td style="text-align: right;">78</td></tr> <tr><td></td><td style="text-align: right;">- 46</td></tr> <tr><td style="border-top: 1px solid black;"></td><td style="text-align: right;">32</td></tr> </table> </div>		TU		78		- 46		32	<p>Using compact column method, subtracting TU - TU and borrowing, moving onto HTU - HTU <i>Carried digits to be placed above the calculation</i></p> <p>e.g. 533 - 248</p> <div style="text-align: center;"> <table style="margin: auto;"> <tr><td></td><td style="text-align: right;">HTU</td></tr> <tr><td></td><td style="text-align: right;">4 12 1</td></tr> <tr><td></td><td style="text-align: right;">533</td></tr> <tr><td></td><td style="text-align: right;">- 248</td></tr> <tr><td style="border-top: 1px solid black;"></td><td style="text-align: right;">285</td></tr> </table> </div>		HTU		4 12 1		533		- 248		285	<p>Using compact column method, subtracting up to ThHTU - ThHTU and borrowing e.g. 6476 - 2684</p> <div style="text-align: center;"> <table style="margin: auto;"> <tr><td></td><td style="text-align: right;">Th H T U</td></tr> <tr><td></td><td style="text-align: right;">5 3 1</td></tr> <tr><td></td><td style="text-align: right;">6476</td></tr> <tr><td></td><td style="text-align: right;">- 2684</td></tr> <tr><td style="border-top: 1px solid black;"></td><td style="text-align: right;">3792</td></tr> </table> </div> <p>Using compact column method, subtracting decimal numbers up to 2 d.p. <i>Line digits up by the decimal point</i> <i>Use '0' as a place holder</i></p>		Th H T U		5 3 1		6476		- 2684		3792																																
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