
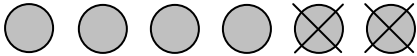


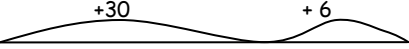
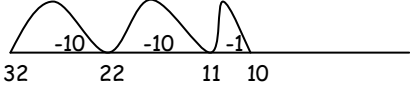
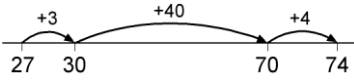
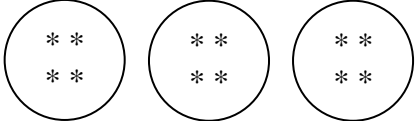
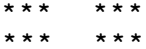


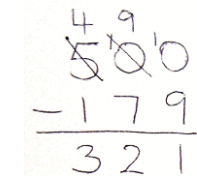


Progression in Calculations

The National Curriculum 2014 requires children to become fluent in the fundamentals of mathematics, to help develop their contextual understanding, allowing them to reason mathematically and solve problems. The expectation is for all children to be proficient in the use of formal written methods and use these in a range of different contexts.

	Addition	Subtraction	Multiplication	Division
Stage 1	 <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Making 5 in different ways</div> <p style="text-align: center;">Pictorial recording</p>	 <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">How many are left?</div> <p style="text-align: center;">Find own ways of recording for subtraction</p>	<p>Count in repeated groups of the same size Oral counting in twos; e.g. pairs of gloves, socks ...</p> <p>Make a bead necklace, 2 red, 2 blue, 2 red, 2 blue ...</p>	<p>Share objects into equal groups and count how many in each group; e.g. fruit for a snack, cup for every person</p>
	<p>Know pairs with a total of 10 Doubles to 5</p> <p>Use number tracks and simple number lines</p> <div style="border: 1px solid black; display: flex; justify-content: space-between; padding: 2px;"> 12345678910 </div>	 <p style="text-align: center;">7 bricks 3 bricks</p> <p>How many are left when 3 bricks are taken away? (Bonds to 10) Find the difference between ...</p> <p>Use number tracks and simple number lines.</p>	<p>Count in repeated groups of the same size Count in 2s, 5s and 10s, beginning to understand that multiplication is the same as repeated addition.</p> <p>Work on doubling numbers (mental recall)</p>	<p>Sharing numbers equally using 2, 5 and 10 groups. E.g. I have 8 wheels, how many bikes can I make? Get into groups of 4 for PE</p> <p>Work on halving numbers (mental recall)</p>
Stage 2	<p>Steps in addition can be recorded on a blank number line. The steps often bridge through a multiple of 10.</p> <p>$28 + 7 = 15$</p> <div style="text-align: center;">  </div> <p>28 30 35</p> <p>$48 + 36 = 84$</p> <div style="text-align: center;">  </div> <p>48 78 84</p>	<p>Counting back on a numberline $32 - 21 =$</p> <div style="text-align: center;">  </div> <p>32 22 11 10</p> <p>Using number line to count on, finding the difference: $74 - 23 =$</p> <div style="text-align: center;">  </div> <p>27 30 70 74</p>	<p>Number line, number track, 100 square as a visual support</p> <p>Understand multiplication as repeated addition</p> <p>Understand multiplication as describing an array/ pictorial representations</p> <div style="border: 1px solid gray; padding: 5px; display: inline-block; margin: 10px;"> <p>OOOOO</p> <p>OOOOO</p> <p>OOOOO</p> </div> <p style="margin-left: 20px;">$\rightarrow 5 \times 3 = 3 \times 5$</p> <p>Use the symbols \times and $=$ to notate number sentences</p>	<p>Sharing equally: $12 \div 3 =$</p> <div style="text-align: center;">  </div> <p>Grouping equally: $12 \div 3 =$</p> <div style="text-align: center;">  </div> <p>\rightarrow Hops on a number line (counting on and back) and then with remainders</p> <div style="text-align: center;">  </div> <p>0 3 6 9 12</p> <p>Use the symbols \div and $=$ to notate number sentences</p>

NB: Stages are progressive and don't correlate to year groups. A child can be on different stages across and within different operations.

<p>Stage 3</p>	<p>Tens and units with no carrying</p> $\begin{array}{r} 53 \\ + 45 \\ \hline 261 \\ + 48 \\ \hline \end{array}$ <p>Initially with TU and then with HTU. Use of concrete apparatus to introduce this method.</p>	<p>Tens and units with no carrying</p>  <p>Initially with TU and then with HTU. Use of concrete apparatus to introduce this method.</p>	<p>Moving this onto using the grid method (use of concrete resources to introduce this)</p> <table border="1" data-bbox="1227 172 1433 279"> <tr> <td></td> <td>10</td> <td>3</td> <td></td> </tr> <tr> <td>8</td> <td>80</td> <td>24</td> <td>TU x U</td> </tr> </table> <table border="1" data-bbox="1216 319 1449 422"> <tr> <td>x</td> <td>30</td> <td>5</td> <td></td> </tr> <tr> <td>20</td> <td>600</td> <td>100</td> <td>TU x TU</td> </tr> <tr> <td>6</td> <td>180</td> <td>30</td> <td></td> </tr> </table> <p>Extending the grid method into TU x TU and then HTU x TU and then decimal numbers:</p>		10	3		8	80	24	TU x U	x	30	5		20	600	100	TU x TU	6	180	30		<p>Long division:</p> $\begin{array}{r} 0 \\ 7 \overline{)452} \\ \underline{0} \\ 45 \\ \underline{45} \\ 0 \end{array} \quad \begin{array}{r} 06 \\ 7 \overline{)452} \\ \underline{0} \\ 45 \\ \underline{42} \\ 32 \end{array} \quad \begin{array}{r} 064 \\ 7 \overline{)452} \\ \underline{0} \\ 45 \\ \underline{42} \\ 32 \\ \underline{28} \\ 4 \end{array}$ <p>Process:</p> <ul style="list-style-type: none"> • Divide • Subtract • Bring down • Repeat <p>81 ÷ 3 =</p> <p>The short division method is recorded like this:</p> $\begin{array}{r} 27 \\ 3 \overline{)81} \end{array}$ <p>291 ÷ 3 =</p> <p>This is then shortened to:</p> $\begin{array}{r} 97 \\ 3 \overline{)291} \end{array}$ <p>Process of:</p> <ul style="list-style-type: none"> • No carrying • Carrying • Remainders/ decimals •
	10	3																						
8	80	24	TU x U																					
x	30	5																						
20	600	100	TU x TU																					
6	180	30																						
<p>Stage 4</p>	<p>Tens and units with carrying</p> $\begin{array}{r} 47 \\ + 76 \\ \hline 123 \\ 11 \end{array} \quad \begin{array}{r} 258 \\ + 87 \\ \hline 345 \\ 11 \end{array} \quad \begin{array}{r} 366 \\ + 458 \\ \hline 824 \\ 11 \end{array}$ <p>Use of concrete resources to demonstrate the process of exchanging.</p> <p>Column addition remains efficient when used with larger whole numbers and decimals. Once learned, the method is quick and reliable.</p>	<p>Tens and units with carrying</p>  <p>Use of concrete resources to demonstrate the process of exchanging.</p> <p>Column subtraction remains efficient when used with larger whole numbers and decimals. Once learned, the method is quick and reliable.</p>	<p>And moving this into the compact written method</p> <p>Working through TU x U, TU x U to HTU x U and then HTU x TU</p> $\begin{array}{r} 469 \\ \times 32 \\ \hline 1938 \\ 14070 \\ \hline 15008 \end{array} \quad \begin{array}{l} 2 \times 469 \\ 30 \times 469 \end{array}$ <p>The compact method for multiplication remains efficient when used with larger whole numbers and decimals. Once learned, the method is quick and reliable.</p>	<p>81 ÷ 3 =</p> <p>The short division method is recorded like this:</p> $\begin{array}{r} 27 \\ 3 \overline{)81} \end{array}$ <p>291 ÷ 3 =</p> <p>This is then shortened to:</p> $\begin{array}{r} 97 \\ 3 \overline{)291} \end{array}$ <p>Process of:</p> <ul style="list-style-type: none"> • No carrying • Carrying • Remainders/ decimals • 																				

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