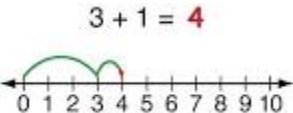
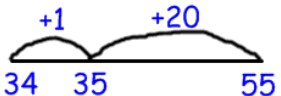
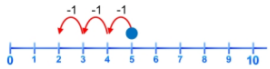
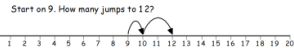
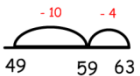
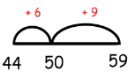




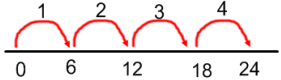
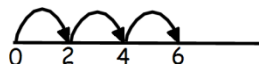
Pathways in Calculation - Addition

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|--|--|---|---|--|--|
| <p>Children need to understand the concept of equality before using the '=' sign. Calculations should be written either side of the equality sign so that the sign is not just interpreted as 'the answer'.</p> <p>2 = 1 + 1 2 + 3 = 4 + 1 3 = 3 2 + 2 + 2 = 4 + 2</p> <p>Missing numbers need to be placed in all possible places.</p> <p>3 + 4 = □ □ = 3 + 4 3 + □ = 7 7 = □ + 4 □ + 4 = 7 7 = 3 + □ □ + ▽ = 7 7 = □ + ▽</p> | <p>Keep the large number whole and partition the number, adding the units first for number line addition.</p> <p>Partition both numbers into tens and units and recombine as a move towards columnar addition, adding units first.</p> | <p>Partition numbers and calculate using columnar method, with and without 'carrying'.</p> | <p>Columnar method up to 4 digits including 'carrying'.</p> <p>Expand to include decimals.</p> | <p>Columnar method, including 'carrying' including decimals to 2 decimal places.</p> | <p>Consolidation of all strategies using a range of numbers and contexts, including decimals, fractions, 3, 3, 4 and 5 digit numbers.</p> <p>Continue as in Year 2, 3, 4 and 5 but with appropriate numbers including extending to adding 0.9, 1.9, 2.9 etc</p> <p>Extend to numbers with any number of digits and decimals with 1, 2 and/or 3 decimal places.</p> <p>13.86 + 9.481 =</p> |
|  |  <p>34 + 21 = 55</p> <p>30 + 4 20 + 1 50 + 5</p> | <p>413 + 225 =</p> <p>400 + 10 + 3 200 + 20 + 5 600 + 30 + 8 = 638</p> <p>466 + 358 =</p> <p>400 + 60 + 6 300 + 50 + 8 800 + 20 + 4 100 10 = 824</p> <p>326 466 +413 +358 739 824 11</p> | <p>3426 + 2352 5778</p> <p>8392 + 4631 13023 11</p> <p>78.5 km +54.6 km 133.1 km 11</p> | <p>6321 + 3263 1337 10921 11</p> <p>124.9 + 7.25 132.15 11</p> | <p>23.341</p> <p>13.86 + 9.481 23.341 111</p> <p>Revert to expanded methods if the children experience any difficulty.</p> |

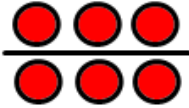


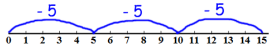
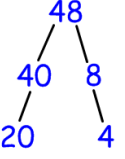
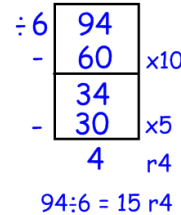
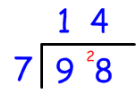
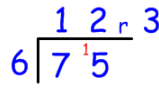
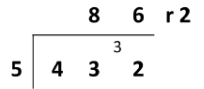
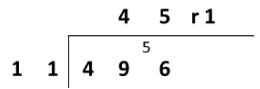
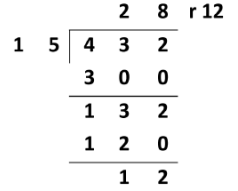
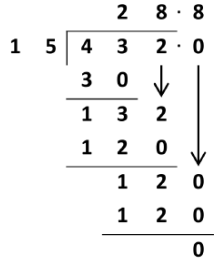
Pathways in Calculation - Subtraction

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|--|---|---|---|--|
| <p>Subtraction as taking away and counting back on a structured number line or number square. Encourage use of number squares to subtract near multiples of 10. Teach counting back before finding the difference and counting on.</p> | <p>Subtraction as taking away, partitioning the subtracted number into tens and units and taking away the units before the tens on a structured and then blank number line. Subtraction as finding the difference for numbers that are close together, using structured number lines and then blank number lines. Expanded method in Summer 2 (not crossing tens)</p> | <p>2 digit column subtraction, initially with no crossing tens. 2 digit column subtraction with 'borrowing' (showing multiples of 10 left) 2 digit column subtraction with 'borrowing'. Expanded 3 digit column subtraction. 3 digit column subtraction with 'borrowing'.</p> | <p>4 digit column subtraction with 'borrowing', extending to 4 digit subtraction and problems involving decimals, including 'borrowing'.</p> | <p>Subtraction questions involving 4 digits and beyond, including decimals.</p> | <p>Consolidation of all strategies using a range of numbers and contexts, including decimals, fractions, 3, 3, 4 and 5 digit numbers. Continue as in Year 2, 3, 4 and 5 but with appropriate numbers including extending to adding 0.9, 1.9, 2.9 etc Extend to numbers with any number of digits and decimals with 1, 2 and/or 3 decimal places.</p> |
| <p>Counting back $5 - 3 = 2$</p>  <p>Counting on if numbers are close together $12 - 9 = 3$</p>  | <p>Counting back, subtracting the units first. e.g. $63 - 14 = 49$</p>  <p>Finding the difference, jumping to the next multiple of ten first. e.g. $59 - 44 = 15$</p>  <p>$54 - 32 = 22$</p> $\begin{array}{r} 50 & 4 \\ - 30 & 2 \\ \hline 20 & 2 \end{array}$ | <p>73 $\begin{array}{r} 73 \\ - 41 \\ \hline 32 \end{array}$</p> <p>$80 - 57 =$</p> $\begin{array}{r} 70 & 10 \\ \cancel{80} & \cancel{0} \\ - 50 & 7 \\ \hline 20 & 3 \end{array}$ <p>$536 - 215 = 321$</p> $\begin{array}{r} 500 & 30 & 6 \\ - 200 & 10 & 5 \\ \hline 300 & 20 & 1 = 321 \end{array}$ <p>leading to 2 digit and 3 digit</p> $\begin{array}{r} 6 & 14 & 14 \\ \cancel{7} & \cancel{5} & \cancel{4} \\ - 2 & 8 & 6 \\ \hline 4 & 6 & 8 \end{array}$ | $\begin{array}{r} 614 & 14 \\ \cancel{7} & \cancel{5} & \cancel{4} \\ - 2 & 8 & 6 \\ \hline 4 & 6 & 8 \end{array}$ $\begin{array}{r} 5 & 13 & 16 \\ \cancel{6} & \cancel{4} & \cancel{6} & 7 \\ - 2 & 6 & 8 & 4 \\ \hline 3 & 7 & 8 & 3 \end{array}$ $\begin{array}{r} 614 & 14 \\ \cancel{7} & \cancel{5} & \cancel{4} \\ - 2 & 8 & . 6 \\ \hline 4 & 6 & . 8 \end{array}$ | $\begin{array}{r} 5 & 13 & 16 \\ \cancel{6} & \cancel{4} & \cancel{6} & 7.4 \\ - 2 & 6 & 8 & 4.3 \\ \hline 3 & 7 & 8 & 3.1 \end{array}$ | |

Pathways in Calculation – Multiplication

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|--|--|--|--|---|-----|----|--|--|---|-----|----|---|--|---|-----|-----|----|--|--|---|----|---|--|----|------|----|--|---|-----|----|--|--|---|------|--|---|-------|--|---|---|-----|------|--|---|----|-----|------|--|
| <p>Rectangular arrays Repeated addition using a structured number line. Use of x sign and vocabulary.</p> | <p>Arrays and use of repeated addition on a number line. Use of vocabulary and x sign for multiplications.</p> | <p>Grid method for 2 digit x 1 digit.</p> | <p>Grid method for 2 digit and 3 digit x 1 digit. Extend to 2 digit x 2 digit for more able using grid method.</p> | <p>Grid method for up to 4 digit x 1 and 2 digit. Column method using long multiplication.</p> | <p>Consolidation of multiplication strategies in different contexts, including money, multiplication of decimals by whole numbers.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <div style="text-align: center;">  </div> <p style="text-align: center;">$4 \times 2 = 8$</p> <p style="text-align: center;">△ △ △ △ △ △ △ △</p> <p style="text-align: center;">or</p> <p style="text-align: center;">$2 \times 4 = 8$</p> <p style="text-align: center;">△ △ △ △ △ △ △ △</p> <div style="text-align: center;">  </div> <p style="text-align: center;">5 10 15</p> <p style="text-align: center;">0 5 10 15</p> <p style="text-align: center;">$5p + 5p + 5p = 15p$</p> | <p style="text-align: center;">$6 \times 4 = 24$</p> <div style="text-align: center;">  </div> <p style="text-align: center;">$3 \times 2 = 6$</p> <div style="text-align: center;">  </div> | <p style="text-align: center;">23×8</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">x</td> <td style="padding: 0 5px;">20</td> <td style="padding: 0 5px;">3</td> <td></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">8</td> <td style="padding: 0 5px;">160</td> <td style="padding: 0 5px;">24</td> <td></td> </tr> </table> <p style="text-align: right; margin-right: 50px;">160</p> <p style="text-align: center;">$+ 24 = 184$</p> | x | 20 | 3 | | 8 | 160 | 24 | | <p style="text-align: center;">123×5</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">x</td> <td style="border-right: 1px solid black; padding: 0 5px;">100</td> <td style="border-right: 1px solid black; padding: 0 5px;">20</td> <td style="padding: 0 5px;">3</td> <td></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">5</td> <td style="border-right: 1px solid black; padding: 0 5px;">500</td> <td style="border-right: 1px solid black; padding: 0 5px;">100</td> <td style="padding: 0 5px;">15</td> <td></td> </tr> </table> <p style="text-align: center; margin-left: 100px;">500 $+ 100$ $+ 15$ <hr style="width: 50px; margin-left: 0;"/>615</p> | x | 100 | 20 | 3 | | 5 | 500 | 100 | 15 | | <p style="text-align: center;">72×38</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">x</td> <td style="padding: 0 5px;">70</td> <td style="padding: 0 5px;">2</td> <td></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">30</td> <td style="padding: 0 5px;">2100</td> <td style="padding: 0 5px;">60</td> <td></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">8</td> <td style="padding: 0 5px;">560</td> <td style="padding: 0 5px;">16</td> <td></td> </tr> </table> <p style="text-align: center; margin-left: 50px;">$2100+$ $560+$ $60+$ <hr style="width: 30px; margin-left: 0;"/>16 2736</p> <p style="text-align: center; margin-left: 50px;">24 $\times 3$ <hr style="width: 20px; margin-left: 0;"/>12 (3×4) 60 (3×20) <hr style="width: 20px; margin-left: 0;"/>72 $= 72$</p> | x | 70 | 2 | | 30 | 2100 | 60 | | 8 | 560 | 16 | | <div style="text-align: center;"> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">x</td> <td style="padding: 0 5px;">2741</td> <td></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">6</td> <td style="padding: 0 5px;">16446</td> <td></td> </tr> </table> <hr style="width: 100%; margin: 0;"/> <p style="text-align: center;">4 2</p> <p style="text-align: center;">Answer: 16 446</p> </div> <p style="text-align: center;">4.92×3</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">x</td> <td style="padding: 0 5px;">4</td> <td style="padding: 0 5px;">0.9</td> <td style="padding: 0 5px;">0.02</td> <td></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">3</td> <td style="padding: 0 5px;">12</td> <td style="padding: 0 5px;">2.7</td> <td style="padding: 0 5px;">0.06</td> <td></td> </tr> </table> <p style="text-align: center; margin-left: 50px;">$= 14.76$</p> | x | 2741 | | 6 | 16446 | | x | 4 | 0.9 | 0.02 | | 3 | 12 | 2.7 | 0.06 | |
| x | 20 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 160 | 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | 100 | 20 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 500 | 100 | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | 70 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | 2100 | 60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 560 | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | 2741 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 16446 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | 4 | 0.9 | 0.02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 12 | 2.7 | 0.06 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Pathways in Calculation – Division

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|--|--|--|---|---|
| <p>Use of arrays to find equal rows and columns of numbers up to 20. Practical opportunities to group and share.</p> | <p>Use of arrays and repeated subtraction on a number line. Partitioning 2 digit numbers to halve.</p> | <p>Use of multiplication facts and “chunking” to find division of 2 digit numbers by 1 digit numbers.</p> | <p>Division Division of 2 digit numbers by 1 digit numbers using the ‘bus stop’ method with and without remainders.</p> | <p>Division using the ‘bus stop’ method of 3 and 4 digit numbers, with and without remainders. Bus stop method with remainders as fractions.</p> | <p>Consolidation of ‘bus stop’ method, with and without remainders. Long division of 4 digit numbers by a 2 digit number with remainders. <i>Higher Ability children – long division using decimals.</i></p> |
| <p>$6 \div 2 = 3$</p>  <p>$16 \div 4 = 4$</p>  | <p>$15 \div 5 = 3$</p>  <p>$15 \div 5 = 3$</p>  <p>$48 \div 2 = 24$</p>  <p>$(20 + 4 = 24)$</p> | <p>$98 \div 7 = 14$ $70 \div 7 = 10$ $28 \div 7 = 4$ $(10 + 4 = 14)$</p> | <p>$94 \div 6 =$</p>  <p>$94 \div 6 = 15 \text{ r}4$</p> <p>$98 \div 7 = 14$</p>  <p>$75 \div 6 =$</p>  | <p>$432 \div 5 =$</p>  <p>Answer: 86 remainder 2</p> <p>$496 \div 11 =$</p>  <p>Answer: $45 \frac{6}{11}$</p> | <p>$432 \div 15 =$</p>  <p>$432 \div 15 =$</p>  <p>Answer: 28.8</p> |