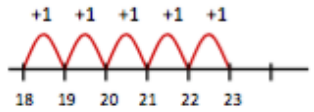
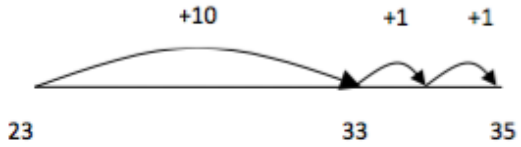
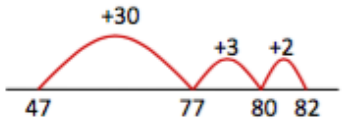
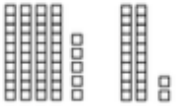
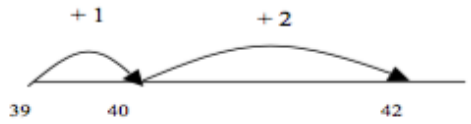
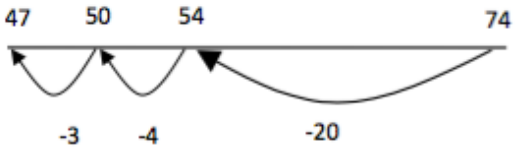
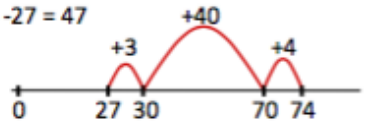
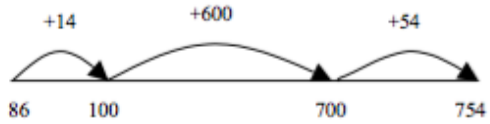
Coberley C of E Calculation Policy

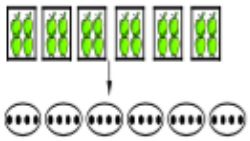
Addition

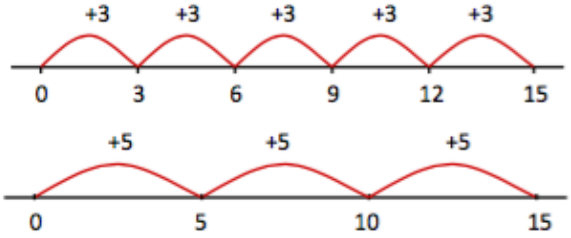
Stage 1	**Number line – jumps of 1** 18 + 5 
Stage 2	**Partitioning the second number and jumping in tens and ones** 23 + 12 = 23 + 10 + 1 + 1 = 33 + 1 + 1 = 35 
Stage 3	**Number line using partitioning (efficient jumps)** 35 + 47  **Extend to HTU + TU (with or without a number line)** 57 + 285 285 + 50 = 335 (this step might need to be broken up into 285 + 15 = 300 → 300 + 35 = 335) 335 + 7 = 342
Stage 4	**Expanded vertical** 336 + 87 13 (6 + 7) 110 (30 + 80) 300 (300 + 0) 423
Stage 5	**Compact vertical** 374 + 248 622 11 **Compact vertical** 3.243 +18.070 21.313 1 1 Extend to more than two numbers and then decimals with differing numbers of decimal places

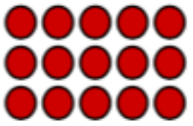
Stage 1	**Pictures / Symbols** 45 – 22 = 23 
Stage 2	**Find a small difference by counting up** 42 – 39 = 3 
Stage 3	**Number lines - taking away** 74 -27 = 47 
	Number lines – counting on/up 74 -27 = 47  [Also jumps can be in 10s and 1s]
Stage 4	**Complementary addition** 754 – 86 = 668 
Stage 5	**Decomposition** Remember to use "exchange" when explaining what is being done with the top number. 741 – 367 6 13 1 7 4 1 - 3 6 7 3 7 4 72.5 – 45.7 6 11 1 7 2 . 5 - 4 5 . 7 2 6 . 8 Develop the stages of decomposition introducing zero 4 1 9 9 1 5 0 0 0 - 4 5 7 4 5 4 3 However, this is not always the best way to solve this calculation **Counting on with large numbers when it is the most efficient method [use empty number line if needed]** 8006 – 2993 = 5013 2993 + 7 = 3000, 3000 + 5000 = 8000 and 8000 + 6 = 8006

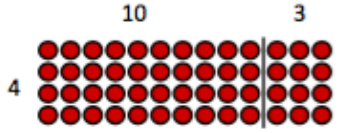
Subtraction

<table>
<tr><td>Stage 1</td><td colspan="2">Pictures / Symbols

There are four apples in each box.
How many apples in six boxes
  </td></tr>
<tr><td>Stage 2</td><td>Repeated addition

5 x 3 or 3 x 5
 
</td><td>Arrays

5 x 3 or 3 x 5
  </td></tr>
<tr><td>Stage 3</td><td>Arrays leading to →

13 x 4:
 

10 x 4 = 40
3 x 4 = 12</td><td>Grid method

47 x 36 (estimate: 50 x 40 = 2000)
<table><tr><td>x</td><td>40</td><td>7</td></tr><tr><td>30</td><td>1200</td><td>210</td></tr><tr><td>6</td><td>240</td><td>42</td></tr></table>
1410
+ 282
1692</td></tr>
<tr><td>Stage 4</td><td colspan="2">Compact vertical

43 x 6 (estimate: 40 x 6 = 240)

43
x 6
258
4</td></tr>
<tr><td>Stage 5</td><td>Compact vertical

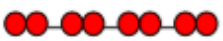
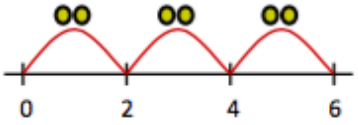
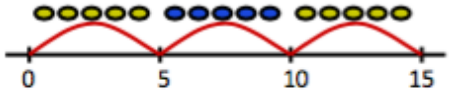
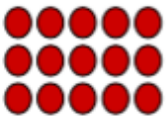
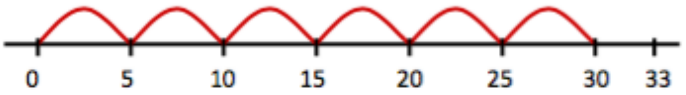
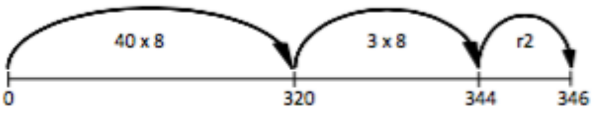
256 x 18 (estimate: 250 x 20 = 5000)

256
x 18
2048 (256 x 8)
2560 (256 x 10)
4608
4</td><td>Compact vertical with a decimal

1.46 x 28 (estimate: 1.5 x 28 = 28 (one of 28) + 14 (half of 28) = 42)

1.46
x 28
11.68 (1.46 x 8)
29.20 (1.46 x 20)
40.88
1</td></tr>
</table>

Multiplication

Stage 1	**Pictures / Symbols** How many apples in each bowl if I share 12 apples between 3 bowls? 
Stage 2	**Number tracks / Number line** 8 ÷ 2 = 4  Ensure language of division is introduced: 1) **GROUPING** – "How many groups of 2 can I make from 8?" 2) **SHARING** – "If I share 8 beads between two people how many will they receive?" 6 ÷ 2 = 3 
Stage 3	**Number lines / Arrays** 15 ÷ 5   **Number lines (start from zero)** 33 ÷ 5 = 6 r3 
Stage 4	**Grouping (efficient on a number line) when dividing by U** 346 ÷ 8 = 43r2 
Stage 5	**'Short' division** 291 ÷ 3 (estimate: 270 ÷ 3 = 90) → $3\overline{)2^{2}9^{2}1}$ with quotient 097 **'Long' Division (dividing by TU)** 432 ÷ 15 becomes 2 8 r12 1 5 | 4 3 2 3 0 0 1 3 2 1 2 0 1 2 Answer: 28 remainder 12 432 ÷ 15 becomes 2 8 1 5 | 4 3 2 3 0 0 15×20 1 3 2 1 2 0 15×8 1 2 $\frac{12}{15} = \frac{4}{5}$ Answer: $28\frac{4}{5}$ 432 ÷ 15 becomes 2 8 · 8 1 5 | 4 3 2 · 0 3 0 ↓ 1 3 2 1 2 0 ↓ 1 2 0 1 2 0 0 Answer: 28·8 The use of a 'Ready Reckoner' is very useful when completing these, start with 10 lots of the divisor and use this to work out other useful amounts: 25 x 15 = 375 20 x 15 = 300 10 x 15 = 150 8 x 15 = 120 5 x 15 = 75 4 x 15 = 60 2 x 15 = 30