

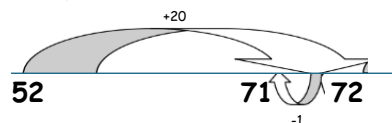
Year 3

Addition

Blank number lines (4)

Children add near multiples of 10 by rounding and adjusting. For example:

$52+19$ can be done as $52+20-1=$



Children would start by adding 20 on the blank number line to get to 72. They would then adjust their answer by subtracting the 1 they added onto the 20.

Partition into tens and ones and recombine (1)

Partition both numbers and recombine.

$$\begin{aligned} 42 + 23 &= 40 + 2 + 20 + 3 \\ &= 60 + 5 \\ &= 65 \end{aligned}$$

This partitioning method can be used with 3 digit numbers.

Column addition (1 expanded)

Children are taught to add in columns using the expanded method (putting the whole number in each column.)

$$\begin{aligned} 342+156 &= \\ 300 + 40 + 2 \\ + 100 + 50 + 6 \\ \hline 400 + 90 + 8 &= 498 \end{aligned}$$

This method can be used to bridge 10 or 100.

$$\begin{aligned} 342+186 &= \\ 300 + 40 + 2 \\ + 100 + 80 + 6 \\ \hline 500 + 20 + 8 &= 528 \end{aligned}$$

100

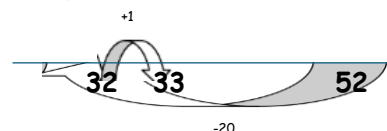
Children to move onto formal written method as appropriate.

Subtraction

Blank number lines (4)

Children subtract near multiples of 10 by rounding and adjusting. For example:

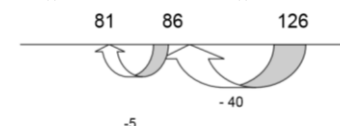
$52-19$ can be done as $52-20+1=$



Children would start by subtracting 20 on the blank number line to get to 32. They would then adjust their answer by adding the 1 they added onto the 20.

Blank number lines (4)

Children further develop the use of the blank number line with numbers that bridge 100.



Partition into tens and units and recombine (1)

With subtraction this method will only work if you partition the 2nd number only!

$$\begin{aligned} 87 - 32 &= 87 - 30 = 57 \\ &= 57 - 2 \\ &= 55 \end{aligned}$$

Decomposition (1 expanded)

$$\begin{aligned} 73 - 27 &= 46 \\ \begin{array}{r} 70 + 3 \\ - 20 + 7 \\ \hline \end{array} &\text{ becomes } \begin{array}{r} 60 + 13 \\ - 20 + 7 \\ \hline 40 + 6 = 46 \end{array} \end{aligned}$$

Children to move onto formal written method as appropriate.

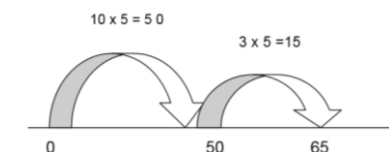
Multiplication

Blank number lines (2)

Children begin to construct a blank number line in order to use their times tables knowledge to multiply larger numbers

e.g.

$$13 \times 5 = 65$$



Grid method (1)

Children are taught to partition the 2 digit number and multiply the 2 parts by the single digit in grid form. They then add together the 2 separate part to get the combined total of the multiplication problem.

$$13 \times 8 =$$

X	10	3
8	80	24

$$80 + 24 = 104$$

This then leads to:

Expanded short multiplication (1)

$$13 \times 8 = 104$$

$$\begin{array}{r} 10 + 3 \\ \times 8 \\ \hline 24 \quad (3 \times 8) \\ + 80 \quad (10 \times 8) \\ \hline 104 \end{array}$$

Children to move onto formal short multiplication method as appropriate.

Division

Blank number lines (1)

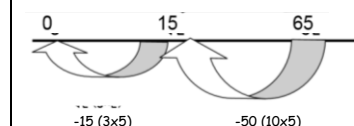
Children continue to use blank number lines (as outlined in y2) to divide by more challenging numbers such as 6,7,8,9.

They also use this method to handle division with remainders.

Chunking (1 using a number line)

Children are taught the first stage in the chunking process by using the blank number line to subtract larger chunks when dividing.

$$65 \div 5 =$$



Short division (1)

Introduce the children to the formal layout for known multiplication and division facts.

$$24 \div 3 = 8$$

This can also be recorded as...

$$\begin{array}{r} 8 \\ 3 \overline{) 24} \end{array}$$

Lyppard Grange Primary School – Progression in Calculation

Year 4

Addition	Subtraction	Multiplication	Division
<p>Column addition (2 formal) Revisiting the expanded method where appropriate, children then move onto a formal method of column addition.</p> <p>176 + 147 = 323</p> $\begin{array}{r} 147 \\ + 176 \\ \hline 323 \end{array}$ <p>Use the language of place value to ensure understanding.</p> <p>If children are confident, they can move onto column addition of 3 digit and 4 digit numbers.</p>	<p>Decomposition (1 expanded) Continue to develop the formal method of subtraction by revisiting expanded subtraction if necessary.</p> <p>258 - 73 = 185</p> $\begin{array}{r} 200 + 50 + 8 \\ - 70 + 3 \\ \hline \end{array} \quad \text{becomes} \quad \begin{array}{r} 100 + 150 + 8 \\ - 70 + 3 \\ \hline 100 + 80 + 5 = 185 \end{array}$ <p>Decomposition (2 formal)</p> $\begin{array}{r} 1 \quad 15 \\ 2 \quad 5 \quad 8 \\ - 7 \quad 3 \\ \hline 1 \quad 7 \quad 5 \end{array}$ <p>Children are taught to bridge 100, 10 or 1 by exchanging a hundred or ten. Use the language of place value to ensure understanding.</p> <p>When children are confident, develop with 4 digit numbers and decimals (in context of money and measures).</p> <p>3625 – 1219 = 2406</p> $\begin{array}{r} 1 \quad 15 \\ 3 \quad 6 \quad 2 \quad 5 \\ - 1 \quad 2 \quad 1 \quad 9 \\ \hline 2 \quad 4 \quad 0 \quad 6 \end{array}$	<p>Children to use grid method and expanded methods to support, as necessary.</p> <p>Short multiplication (1) Children build on their knowledge of expanded method when using the formal method.</p> <p>36 x 4 = 144</p> $\begin{array}{r} 36 \\ \times 4 \\ \hline 144 \end{array}$ <p>Expanded short multiplication (2) Children multiply 3 digit numbers by 1 digit numbers, using the expanded method.</p> <p>127 x 6 = 762</p> $\begin{array}{r} 127 \\ \times 6 \\ \hline 42 \quad (6 \times 7) \\ + 120 \quad (6 \times 20) \\ \hline 600 \quad (6 \times 100) \\ \hline 762 \end{array}$ <p>Short multiplication (2) Children multiply 3 digit numbers by 1 digit numbers, using the formal method.</p> $\begin{array}{r} 127 \\ \times 6 \\ \hline 762 \end{array}$	<p>Chunking 1 (using a number line) Children continue using this method to divide 2 or 3 digit numbers by a single digit.</p> <p>Chunking 2 (without a number line) Children will need to practise partitioning numbers in a variety of ways.</p> <p>98 ÷ 7 = 14</p> $\begin{array}{r} 10 + 4 = 14 \\ 7 \overline{) 98} \end{array}$ <p>This will then lead to:</p> <p>Short division (2 formal) Children use the formal method of division, with whole number answers.</p> <p>98 ÷ 7 = 14</p> $\begin{array}{r} 14 \\ 7 \overline{) 98} \end{array}$

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Year 5

Addition	Subtraction	Multiplication	Division
<p><u>Column addition (3)</u></p> <p>Children continue to develop the formal method for addition with larger numbers and decimal numbers</p> <p>This can then be lead in to bridging 100, 10 or 1 by showing the numbers you have carried underneath.</p> <p>21848 + 1523 = 23371</p> $\begin{array}{r} 21848 \\ + 1523 \\ \hline 23371 \end{array}$ <p>Remember - In Year 5 all children should be using these methods to solve 2, 3 4 and 5 digit and decimal problems up to 2 decimal places.</p> <p>£154.75 + £233.82 = £388.57</p> $\begin{array}{r} 154.75 \\ + 233.82 \\ \hline 388.57 \end{array}$	<p><u>Decomposition (3 formal)</u></p> <p>Children continue to develop the formal method for subtraction with three and four digit numbers, returning to expanded method and using base ten, if required.</p> <p>503 – 278 = 225</p> $\begin{array}{r} 500 + 0 + 3 \\ - 200 + 70 + 8 \\ \hline 300 + 70 + 5 \end{array}$ <p>Leads to the formal method.</p> $\begin{array}{r} 4 \text{ } 9 \text{ } 13 \\ 503 \\ - 278 \\ \hline 225 \end{array}$ <p>Children to be secure in how to bridge 100, 10 or 1 by exchanging a hundred or ten. Use the language of place value to ensure understanding.</p> <p>Extend to larger numbers and decimals in context.</p> $\begin{array}{r} 16 \text{ } 5 \text{ } 12 \\ 466.25 \\ - 83.72 \\ \hline 382.53 \end{array}$	<p>Children continue to build upon the formal methods they have previously been taught.</p> <p><u>Expanded long multiplication (1)</u></p> $\begin{array}{r} 23 \times 13 = 299 \\ \begin{array}{r} 23 \\ \times 13 \\ \hline 69 \quad (3 \times 3) \\ 230 \quad (3 \times 20) \\ \hline 299 \end{array} \end{array}$ <p>This then leads to:</p> <p><u>Compact long multiplication (1)</u></p> $\begin{array}{r} 23 \times 13 = 299 \\ \begin{array}{r} 23 \\ \times 13 \\ \hline 69 \quad (3 \times 23) \\ 230 \quad (10 \times 23) \\ \hline 299 \end{array} \end{array}$ <p>Once children are secure in this method, they then are extended to larger 2 digit calculations and 2 digit x 3 digit calculations.</p> <p>124 x 26 = 3224</p> $\begin{array}{r} 124 \\ \times 26 \\ \hline 744 \quad (6 \times 124) \\ 2480 \quad (20 \times 124) \\ \hline 3224 \end{array}$ <p>The prompts in brackets can be omitted if children no longer need them.</p>	<p><u>Short division (3)</u></p> <p>Children continue to practise the formal method of division with whole number answers.</p> <p>184 ÷ 8 = 23</p> $\begin{array}{r} 23 \\ 8 \overline{) 184} \end{array}$ <p>Children continue to practise the formal method of division with answers that give remainders.</p> $\begin{array}{r} 86 \text{ r } 2 \\ 5 \overline{) 433} \end{array}$ <p>The remainder can also be expressed as a fraction. (2/5 in this example.)</p>

Lyppard Grange Primary School - Progression in Calculation

Year 6

Addition	Subtraction	Multiplication	Division
<p><u>Column addition (3)</u></p> <p>Ensure children are secure with this method for addition.</p>	<p><u>Decomposition (3)</u></p> <p>Ensure children are secure with this method for subtraction.</p>	<p><u>Compact long multiplication (2)</u></p> <p>Children continue to build upon their understanding of the formal method for multiplication, extending to multiplying numbers up to 4 digits (including decimals) by 2 digit whole numbers.</p> $\begin{array}{r} 53.2 \\ \times 24.0 \\ \hline 212.8 \quad (53.2 \times 4) \\ 1064.0 \quad (53.2 \times 20) \\ \hline 1276.8 \end{array}$ <p>The prompts in brackets can be omitted if children no longer need them.</p>	<p><u>Short division (4)</u></p> <p>Children continue to build upon their understanding of the formal method of short division.</p> $496 \div 11 = 45 \text{ r}1$ $\begin{array}{r} 45 \text{ r}1 \\ 11 \overline{) 496} \\ \underline{44} \\ 56 \\ \underline{55} \\ 1 \end{array}$ <p><u>Long division (1)</u></p> $432 \div 15 = 28 \text{ r}12$ $\begin{array}{r} 28 \text{ r}12 \\ 15 \overline{) 432} \\ \underline{300} \quad (20 \times 15) \\ 132 \\ \underline{120} \quad (8 \times 15) \\ 12 \text{ (remainder)} \end{array}$ <p>The remainder can be expressed as a fraction 12/15</p> <p><u>Long division (2)</u></p> <p>Children can then be extended to calculating the answer as a decimal.</p> $432 \div 15 = 28.8$ $\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{30} \downarrow \\ 132 \\ \underline{120} \downarrow \\ 120 \\ \underline{120} \\ 0 \end{array}$