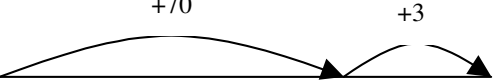


WRITTEN ADDITION METHODS

Year 1	Year 2	Year 3
<u>+ = signs and missing numbers</u> $3 + 4 =$ $= 3 + 4$ $3 + \quad = 7$ $7 = \quad + 4$ $\quad + 4 = 7$ $7 = 3 + \quad$ $\quad + \nabla = 7$ $7 = \quad + \nabla$ Promoting covering up of operations and numbers using pictorial representations. <u>Numbered number lines,</u> Teacher will model the use of number lines and children will then use to help with their own addition calculations. $7 + 4 = 11$  0 1 2 3 4 5 6 7 8 9 10 11 12 13	<u>+ = signs and missing numbers</u> Continue using a range of equations as in Year 1 but with appropriate, larger numbers. Pictorial, Written and mental addition of; - 2 digit number and a 1 digit number ($23 + 6$) - 2 digit number and a tens ($23 + 20$) - 2 two digit numbers ($23 + 19$) - Adding 3 one digit numbers ($4 + 6 + 9$) <u>Written methods to include;</u> Partitioning and recombining $\begin{array}{r} 23 \\ / \quad \backslash \\ 20 \quad 3 \end{array} + \begin{array}{r} 12 \\ / \quad \backslash \\ 10 \quad 2 \end{array}$ EXT to partitioning the second number only $23 + 10 + 2$ <u>Numberline method:</u>  23 33 35	<u>+ = signs and missing numbers</u> Continue using a range of equations as in Year 2 but with appropriate, larger numbers. Partition into hundreds, tens and ones and recombine Either partition both numbers and recombine or partition the second number only e.g. $358 + 73 = 358 + 70 + 3$ $= 428 + 3$ $= 431$  358 428 431 As children become more familiar with working with larger numbers and at the teacher's discretion (taking SEN into account) the column method of addition will be introduced. $\begin{array}{r} 83 \\ + 42 \\ \hline 5 \\ \hline 120 \\ 125 \end{array}$ $\begin{array}{r} 195 \\ + 124 \\ \hline 9 \\ \hline 110 \\ 200 \\ \hline 319 \end{array}$

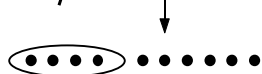
WRITTEN ADDITION		
Year 4	Year 5	Year 6
<u>Written Methods (as appropriate);</u> $283 + 142$ $ \begin{array}{r} 283 \\ + 142 \\ \hline 5 \\ 120 \\ \hline 300 \\ \hline 425 \end{array} $ <u>EXT to 4 digits as soon as children are ready;</u> $3358 + 1273$ $ \begin{array}{r} 3358 \\ + 1273 \\ \hline 11 \\ 120 \\ 500 \\ \hline 4000 \\ \hline 4631 \end{array} $	<u>Pencil and paper procedures</u> Leading to formal method, showing numbers carried on the line; $ \begin{array}{r} 2358 \\ + 1713 \\ \hline 4171 \end{array} $ Extend to decimals (2 decimal places) $ \begin{array}{r} 12.76 \\ + 8.43 \\ \hline 21.19 \end{array} $ <i>Model negative numbers using a number line <u>both vertically and horizontally.</u></i>	As Year 5 but with larger numbers and 3 decimal places. <u>Children should be able to choose the most reliable and efficient methods for themselves.</u>

WRITTEN SUBTRACTION

Year 1

Pictures / marks - Visual / practical activities

Sam spent 4p. What was his change from 10p?



- = signs and missing numbers

$$7 - 3 = \quad = 7 - 3$$

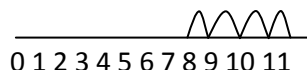
$$7 - \quad = 4 \quad 4 = \quad - 3$$

$$- 3 = 4 \quad 4 = 7 -$$

$$- \nabla = 4 \quad 4 = \quad - \nabla$$

Number lines numbered;

$$11 - 4 = 7$$



Counting back from 11 to 7 (counting on top of the line)

Recording by - drawing jumps on prepared lines
- constructing own lines

(Teachers model jottings appropriate for larger numbers)

Year 2

- = signs and missing numbers

Continue using a range of equations as in Level 1 but with appropriate numbers.

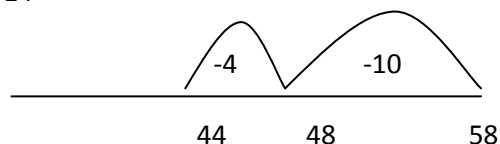
Extend to $14 + 5 = 20 -$

Find a small difference by counting up

Beginning with the 'numbered' number line to subtract from the largest number.

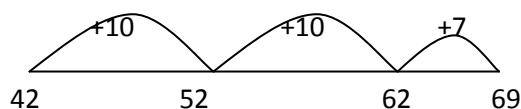
Ext to a blank number line (with 100 square to support subtracting the 10 if necessary)

$$58 - 14$$



When children are secure with this, they may move onto subtracting by finding the difference (complementary addition)

$$69 - 42$$



Year 3

Find a small difference by counting up

Continue as in Level 2 but with;

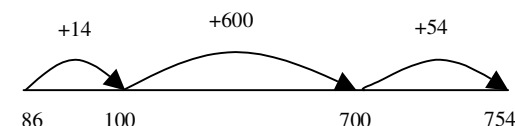
- 3 digit number subtract a one digit

- 3 digit number subtract a ten

- 3 digit number subtract another 3 digit

Complementary addition

$$754 - 86$$



As children become more familiar with working with larger numbers and at the teacher's discretion (taking SEN into account) the column method of subtraction will be introduced.

WRITTEN SUBTRACTION		
Year 4	Year 5	Year 6
<u>Written Methods – column subtraction</u> $\begin{array}{r} 98 \\ - 24 \\ \hline 4 \quad (8-4) \\ 70 \quad (90-20) \\ \hline 74 \end{array}$ Use decomposition with top set when appropriate $\begin{array}{rcl} 90 + 2 & \longrightarrow & 80 + 12 \\ 30 + 8 & - & 30 + 8 \\ & & 50 + 4 \end{array}$ Ext to decomposition	<u>Written Methods – column subtraction</u> Use decomposition $\begin{array}{r} 5643 - 3472 \\ ^5\cancel{6}43 \\ - 3472 \\ \hline 2171 \end{array}$ 2dp $23.76 - 12.67$ $\begin{array}{r} 23.\cancel{7}6 \\ - 12.67 \\ \hline 11.09 \end{array}$	<u>Written Methods – column subtraction</u> Use decomposition As Year 5 but with larger numbers and 3 decimal places. <u>Children should be able to choose the most reliable and efficient methods for themselves.</u>

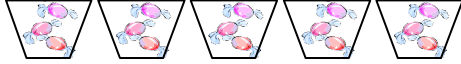
WRITTEN MULTIPLICATION

Level 1

Pictures and symbols

There are 3 sweets in one bag.

How many sweets are there in 5 bags?



(Recording on a number line modelled by the teacher when solving problems)

Level 2

x = signs and missing numbers

$$7 \times 2 = \quad = 2 \times 7$$

$$7 \times \quad = 14 \quad 14 = \times 7$$

$$\times 2 = 14 \quad 14 = 2 \times$$

$$\times \nabla = 14 \quad 14 = \times \nabla$$

Arrays continued and repeated addition

$$\begin{array}{cccc} \bullet & \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet & \bullet \end{array} \quad 4 \times 2 \text{ or } 4 + 4$$

$$2 \times 4$$

or repeated addition

$$2 + 2 + 2 + 2$$

$$\underline{15 \times 2 = 30}$$

Partition

$$\begin{array}{r} (10 \times 2) + (5 \times 2) \\ 20 \quad + \quad 10 \\ \hline = 30 \end{array}$$

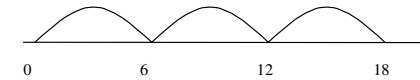
Year 3

x = signs and missing numbers

Continue using a range of equations as in Level 2 but with appropriate numbers.

Number lines

$$6 \times 3$$



$$\underline{35 \times 2 = 70 \text{ (TU x U)}}$$

Partition and introduce the grid methods as early into Year 3 as possible.

x	30	5
2	60	10

WRITTEN MULTIPLICATION

Level 4	Year 5	Year 6
<u>x = signs and missing numbers</u> Continue using a range of equations as in Year 2 but with appropriate numbers <u>Grid method</u> <u>23 x 7</u> x 7 20 3 <u>123 x 3</u> x 7 100 20 3 As children become more familiar with working with larger numbers and at the teacher’s discretion (taking SEN into account) the column method of multiplication will be introduced – as in Year 5.	<u>x = signs and missing numbers</u> Continue using a range of equations as in Year 2 but with appropriate numbers <u>Estimate and check in all written methods</u> <u>1125 x 7</u> 1125 7 137 7875 <u>1125 x 17</u> 1125 17 137 7875 11250 19125	<u>x = signs and missing numbers</u> Continue using a range of equations as in Year 2 but with appropriate numbers <u>3721 x 14</u> <u>Efficient methods – as in Year 5</u> <u>Grid method for decimals</u> 7 x 3.8 (1 decimal place) 7 x 3.86 (2 decimal places) x 7 3 0.8 21 5.6 0.6 0.16 21.60 5.76 = 21.60 + 27.36

WRITTEN DIVISION

Year 1

Pictures / marks

12 children get into teams of 4 to play a game. How many teams are there?



Year 2

÷ = signs and missing numbers

$$\begin{array}{lcl} 6 \div 2 = & & = 6 \div 2 \\ 6 \div & = & 3 \\ \div 2 = & 3 & 3 = 6 \div \\ \div \nabla = & 3 & 3 = \div \nabla \end{array}$$

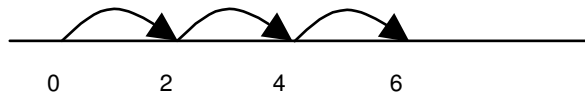
Understand division as sharing and grouping

Sharing – 6 sweets are shared between 2 people. How many do they have each?



6 ÷ 2 can be modelled practically as:

Grouping – There are 6 sweets. How many people can have 2 each? (How many 2's make 6?)



Year 3

÷ = signs and missing numbers

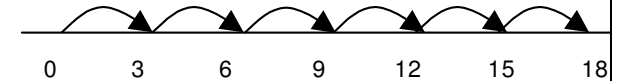
Continue using a range of equations as in Level 2 but with appropriate numbers.

Understand division as sharing and grouping

18 ÷ 3 can be modelled as:

Sharing – 18 shared between 3 (see Year 2 diagram)

Grouping – How many 3's make 18?



Remainders

16 ÷ 3

Sharing – 16 shared between 3, how many left over?

Grouping – How many 3's make 16, how many left over?



WRITTEN DIVISION

Year 4

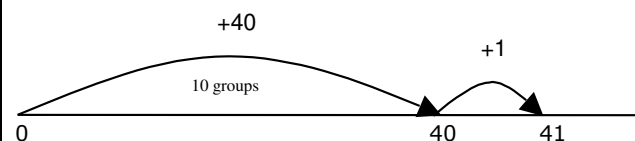
÷ = signs and missing numbers

Sharing and grouping initially

$$30 \div 6$$

- **grouping** – groups of 6 taken away and the number of groups counted e.g.
- **sharing** – sharing among 6, the number given to each person

$$41 \div 4$$



Moving onto:

Bus stop method for short division

$$234 \div 6$$

$$6 \overline{)234}$$

Year 5

÷ = signs and missing numbers

Bus stop method for short division

$$2341 \div 6$$

$$6 \overline{)2341}$$

Remainders

To be interpreted depending on the context ie money, decimals if appropriate etc

Move onto chunking as long division when children are ready to move onto division by a 2 digit number. ie $348 \div 12$

Year 6

÷ = signs and missing numbers

Divide 4 digits by 2 digits.

$$3452 \div 13$$

Include fact boxes for; x1, x2, x5, x10, x20

Remainders

Quotients expressed as fractions or decimal fractions

$$676 \div 8 = 84.5$$