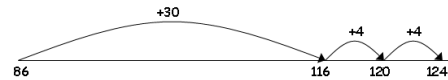


Addition

Children will continue to use empty number lines with increasingly large numbers, including compensation where appropriate.

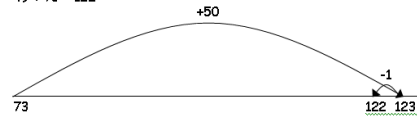
- ✓ Count on from the largest number irrespective of the order of the calculation.

$$38 + 86 = 124$$



- ✓ Compensation

$$49 + 73 = 122$$



Children will begin to use informal pencil and paper methods (jottings) to support, record and explain partial mental methods building on existing mental strategies.

Adding the least significant digits first

$\begin{array}{r} 67 \\ + 24 \\ \hline 11 \text{ (7 + 4)} \\ 80 \text{ (60 + 20)} \\ \hline 91 \end{array}$	$\begin{array}{r} 267 \\ + 85 \\ \hline 12 \text{ (7 + 5)} \\ 140 \text{ (60 + 80)} \\ \hline 200 \\ \hline 352 \end{array}$
---	--

Subtraction

Children will continue to use empty number lines with increasingly large numbers.

Children will begin to use informal pencil and paper methods (jottings).

$$\begin{array}{r} 89 \\ - 57 \\ \hline \end{array} = \begin{array}{r} 80 \\ + 9 \\ \hline \end{array} = \begin{array}{r} 50 \\ + 7 \\ \hline \end{array} = \begin{array}{r} 30 \\ + 2 \\ \hline \end{array} = 32$$

- ✓ Begin to exchange.

$$\begin{array}{r} 71 \\ - 46 \\ \hline \end{array} = \quad =$$

Step 1 $\begin{array}{r} 70 \\ - 40 \\ \hline \end{array} + \begin{array}{r} 1 \\ + 6 \\ \hline \end{array}$

Step 2 $\begin{array}{r} 60 \\ - 40 \\ \hline \end{array} + \begin{array}{r} 11 \\ + 6 \\ \hline \end{array} = 25$

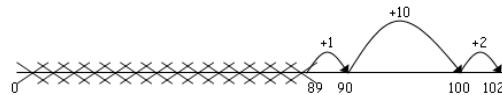
The calculation should be read as e.g. take 6 from 1.

This would be recorded by the children as

$$\begin{array}{r} 70 \\ - 40 \\ \hline \end{array} + \begin{array}{r} 1 \\ + 6 \\ \hline \end{array} = 25$$

Where the numbers are involved in the calculation are close together or near to multiples of 10, 100 etc counting on using a number line should be used.

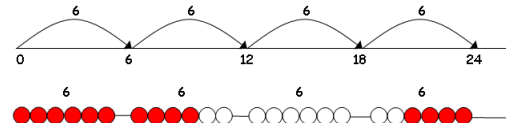
$$102 - 89 = 13$$



Multiplication

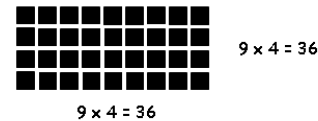
Children will continue to use:

- ✓ Repeated addition
4 times 6 is $6 + 6 + 6 + 6 = 24$ or 4 lots of 6 or 6×4
Children should use number lines or bead bars to support their understanding.



- ✓ Arrays

Children should be able to model a multiplication calculation using an array. This knowledge will support with the development of the grid method.



- ✓ Scaling
e.g. Find a ribbon that is 4 times as long as the blue ribbon



- ✓ Using symbols to stand for unknown numbers to complete equations using inverse operations

$$\square \times 5 = 20 \qquad 3 \times \triangle = 18$$

$$\square \times \circ = 32$$

- ✓ Partitioning

$$\begin{aligned} 38 \times 5 &= (30 \times 5) + (8 \times 5) \\ &= 150 + 40 \\ &= 190 \end{aligned}$$

Division

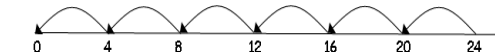
Ensure that the emphasis in Y3 is on grouping rather than sharing.

Children will continue to use:

- ✓ Repeated subtraction using a number line

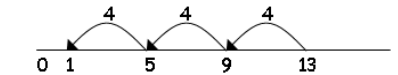
Children will use an empty number line to support their calculation.

$$24 \div 4 = 6$$



Children should also move onto calculations involving remainders.

$$13 \div 4 = 3 \text{ r } 1$$



- ✓ Using symbols to stand for unknown numbers to complete equations using inverse operations

$$26 \div 2 = \square \qquad 24 \div \triangle = 12$$

$$\square \div 10 = 8$$

- ✓ Partitioning including remainders

$$\begin{aligned} 55 \div 5 &= (50 \div 5) + (5 \div 5) \\ &= 10 + 1 \\ &= 11 \end{aligned}$$

Y3

Children should not be made to go onto the next stage if they are not ready or if they are not confident.

Children should be encouraged to approximate their answers before calculating.

Children should be encouraged to consider if a mental calculation would be appropriate before using written methods.

Addition

Carry below the line.

$$\begin{array}{r} 625 \\ + 48 \\ \hline 673 \\ 1 \end{array} \quad \begin{array}{r} 783 \\ + 42 \\ \hline 825 \\ 1 \end{array} \quad \begin{array}{r} 367 \\ + 85 \\ \hline 452 \\ 11 \end{array}$$

Using similar methods, children will:

- ✓ add several numbers with different numbers of digits;
- ✓ begin to add two or more three-digit sums of money, with or without adjustment from the pence to the pounds;
- ✓ know that the decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. £3.59 + 78p.

Subtraction

Partitioning and decomposition

$$\begin{array}{r} 754 \\ - 86 \\ \hline \end{array}$$

Step 1 $700 + 50 + 4$
 $- 80 + 6$

Step 2 $700 + 40 + 14$ (adjust from T to U)
 $- 80 + 6$

Step 3 $600 + 140 + 14$ (adjust from H to T)
 $- 80 + 6$
 $600 + 60 + 8 = 668$

This would be recorded by the children as

$$\begin{array}{r} 600 \\ + 60 \\ + 8 \\ \hline 668 \end{array}$$

Decomposition

$$\begin{array}{r} 6141 \\ - 784 \\ \hline 668 \end{array}$$

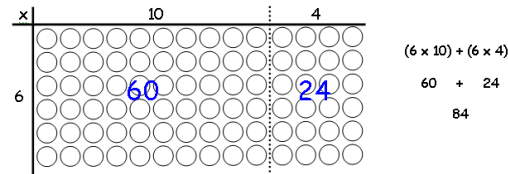
Children should:

- ✓ be able to subtract numbers with different numbers of digits;
- ✓ using this method, children should also begin to find the difference between two three-digit sums of money, with or without 'adjustment' from the pence to the pounds;
- ✓ know that decimal points should line up under each other.

$$\begin{array}{r} \text{£}8.95 \\ - \text{£}4.38 \\ \hline \end{array} = \begin{array}{r} 8 + 0.9 + 0.05 \\ - 4 + 0.3 + 0.08 \\ \hline 8 + 0.8 + 0.15 \\ - 4 + 0.3 + 0.08 \\ \hline 4 + 0.5 + 0.07 \end{array} \quad \begin{array}{l} \text{leading to} \\ 8.85 \\ - 4.38 \\ \hline 4.47 \end{array}$$

Multiplication

Children will continue to use arrays where appropriate leading into the grid method of multiplication.



Grid method

TU x U

(Short multiplication - multiplication by a single digit)

$$23 \times 8$$

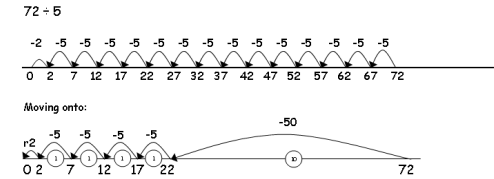
Children will approximate first

$$23 \times 8 \text{ is approximately } 25 \times 8 = 200$$

$$\begin{array}{r} \times 20 \quad 3 \\ 8 \quad \boxed{160} \quad \boxed{24} \\ \hline 160 \\ + 24 \\ \hline 184 \end{array}$$

Division

Children will develop their use of repeated subtraction to be able to subtract multiples of the divisor. Initially, these should be multiples of 10s, 5s, 2s and 1s - numbers with which the children are more familiar.



Partition TU into multiple of 10 of the divisor plus the remaining ones, then divide each part separately.

$$\begin{array}{l} 87 \div 3 \\ 87 = 60 + 27 \\ 60 \div 3 = 20 \\ 27 \div 3 = 9 \\ 20 + 9 = 29 \end{array}$$

Including remainders:

$$\begin{array}{l} 96 \div 7 \\ 96 = 70 + 26 \\ 70 \div 7 = 10 \\ 26 \div 7 = 3 \text{ r } 5 \\ 10 + 3 \text{ r } 5 = 13 \text{ r } 5 \end{array}$$

Any remainders should be shown as integers, i.e. 14 remainder 2 or 14 r 2.

Children need to be able to decide what to do after division and round up or down accordingly. They should make sensible decisions about rounding up or down after division.

Y4

Children should not be made to go onto the next stage if they are not ready or if they are not confident.

Children should be encouraged to approximate their answers before calculating.

Children should be encouraged to consider if a mental calculation would be appropriate before using written methods.