

Year 3 ADDITION

MENTAL CALCULATION. Many strategies, including:

Mental recall of number bonds

$$6 + 4 = 10$$

$$\square + 3 = 10$$

$$25 + 75 = 100$$

$$19 + \square = 20$$

Use near doubles

$$6 + 7 = \text{double } 6 + 1 = 13$$

Addition using partitioning (splitting up) and recombining

$$34 + 45 = (30 + 40) + (4 + 5) = 79$$

Counting on or back in repeated steps of 1, 10, 100, 1000

$$86 + 57 = 143 \text{ (by counting on in tens and then in ones)}$$

Add the nearest multiple of 10, 100 and 1000 and adjust

$$24 + 19 = 24 + 20 - 1 = 43$$

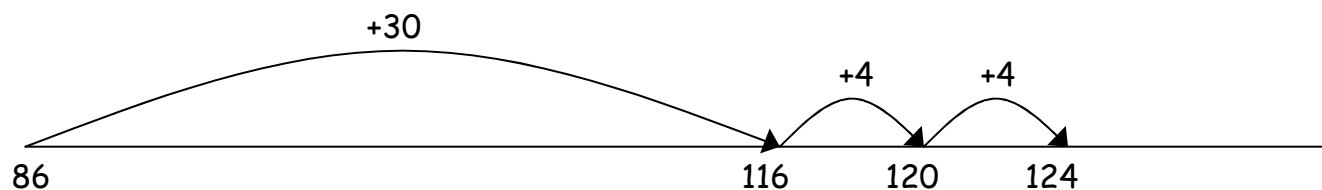
$$458 + 71 = 458 + 70 + 1 = 529$$

written methods

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.

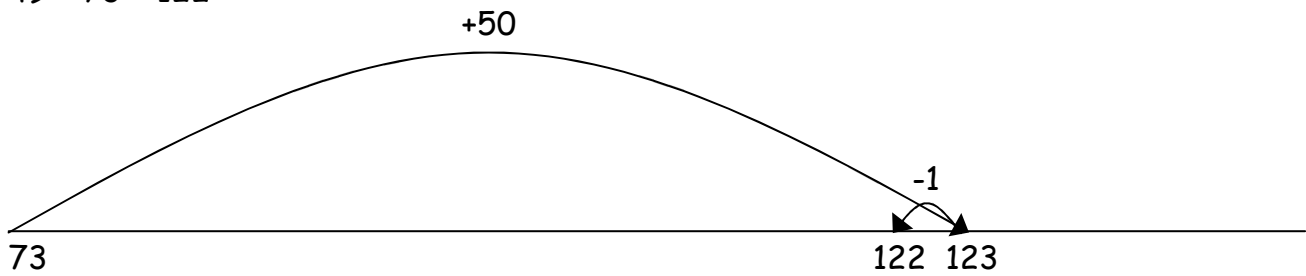
$$38 + 86 = 124$$



Year 3 Addition (cont.)

✓ 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 in preparation for 'carrying'.

$$\begin{array}{r} 67 \\ + 24 \\ \hline 11 \text{ (} 7 + 4 \text{)} \\ \underline{80} \text{ (} 60 + 20 \text{)} \\ \underline{91} \end{array}$$

$$\begin{array}{r} 267 \\ + 85 \\ \hline 12 \text{ (} 7 + 5 \text{)} \\ 140 \text{ (} 60 + 80 \text{)} \\ \underline{200} \\ \underline{352} \end{array}$$

Year 3 SUBTRACTION

MENTAL CALCULATION. Many strategies, including:

Mental recall of addition and subtraction facts

$$10 - 6 = 4 \qquad 17 - \square = 11$$

$$20 - 17 = 3 \qquad 10 - \square = 2$$

Find a small difference by counting up

$$82 - 79 = 3$$

Counting on or back in repeated steps of 1, 10, 100, 1000

$$86 - 52 = 34 \text{ (counting back from 86 in tens and then in ones or counting on from 52 to 86)}$$

$$460 - 300 = 160 \text{ (counting back in hundreds from 460 or counting on from 300 to 460)}$$

Subtract the nearest multiple of 10, 100 and 1000 and adjust

$$24 - 19 = 24 - 20 + 1 = 5$$

$$458 - 71 = 458 - 70 - 1 = 387$$

Use the relationship between addition and subtraction

$$36 + 19 = 55 \qquad 19 + 36 = 55$$

$$55 - 19 = 36 \qquad 55 - 36 = 19$$

WRITTEN METHODS

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

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

Partitioning and decomposition

This process should be demonstrated using arrow cards to show the partitioning and base 10 materials to show the decomposition of the number.

NOTE When solving the calculation $89 - 57$, children should know that 57 **does NOT EXIST AS AN AMOUNT** it is what you are subtracting from the other number.

Therefore, when using base 10 materials, children would need to count out only the 89.

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

Initially, the children will be taught using examples that do not need the children to exchange.

From this the children will begin to exchange.

Year 3 Subtraction (cont.)

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

Step 1

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

Step 2

$$\begin{array}{r} 60 + 11 \\ - 40 + 6 \\ \hline 20 + 5 = 25 \end{array}$$

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

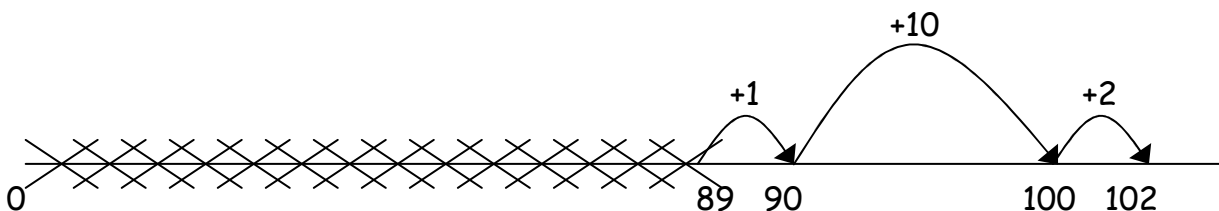
This would be recorded by the children as

$$\begin{array}{r} \overset{60}{\cancel{70}} + 1 \\ - 40 + 6 \\ \hline 20 + 5 = 25 \end{array}$$

Children should know that units line up under units, tens under tens, and so on.

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.

$$102 - 89 = 13$$



Year 3 MULTIPLICATION

MENTAL CALCULATIONS. Many strategies, including:

Doubling and halving

Applying the knowledge of doubles and halves to known facts.

e.g. 8×4 is double 4×4

Using multiplication facts

tables : $\times 2$ $\times 3$ $\times 4$ $\times 5$ $\times 6$ $\times 10$

Use closely related facts already known

$$13 \times 11 = (13 \times 10) + (13 \times 1)$$

$$= 130 + 13$$

$$= 143$$

Multiplying by 10 or 100

Knowing that the effect of multiplying by 10 is a shift in the digits one place to the left.

Knowing that the effect of multiplying by 100 is a shift in the digits two places to the left.

Use of factors

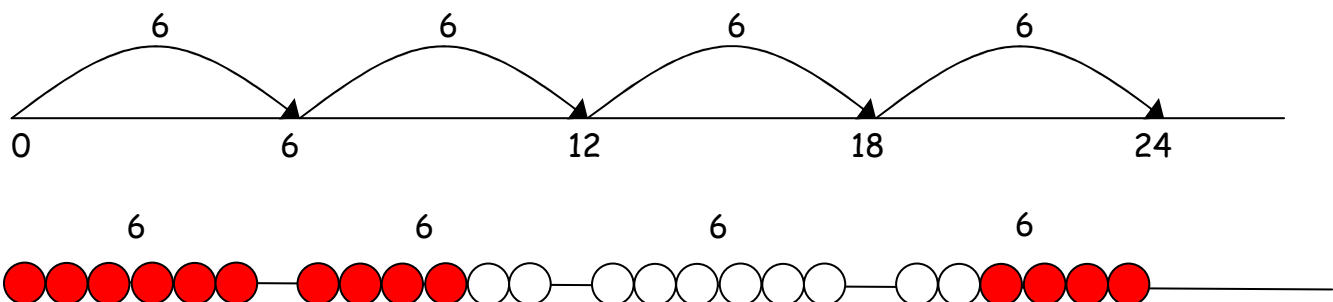
$$8 \times 12 = 8 \times 4 \times 3$$

Children will continue to use:

✓ **Repeated addition**

4 times 6 is $6 + 6 + 6 + 6 = 24$ or 4 lots of 6 or 6×4

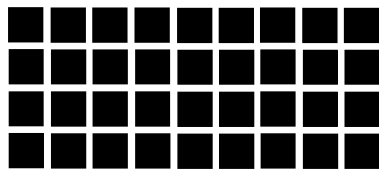
Children should use number lines or bead bars to support their understanding.



Year 3 Multiplication (cont.)

✓ Arrays

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



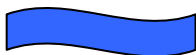
$$9 \times 4 = 36$$

$$9 \times 4 = 36$$

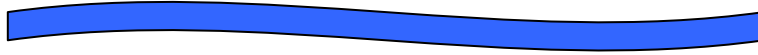
Children will also develop an understanding of

✓ Scaling

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



5 cm



20 cm

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

$$\square \times 5 = 20$$

$$3 \times \triangle = 18$$

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

✓ Partitioning

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

Year 3 DIVISION

MENTAL CALCULATIONS. Many strategies, including:

Doubling and halving

Knowing that halving is dividing by 2

Deriving and recalling division facts

Tables: x2 x3 x4 x5 x6 x10

Dividing by 10 or 100

Knowing that the effect of dividing by 10 is a shift in the digits one place to the right.

Knowing that the effect of dividing by 100 is a shift in the digits two places to the right.

Use related facts

Given that $14 \times 9 = 126$

What is $126 \div 9$?

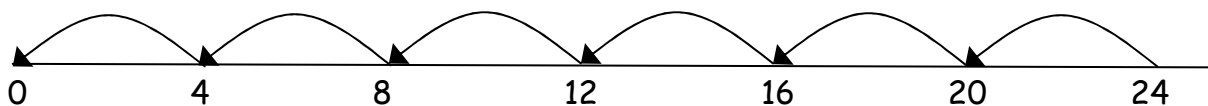
The emphasis in Y3 is on grouping rather than sharing.

Children will continue to use:

✓ **Repeated subtraction using a number line**

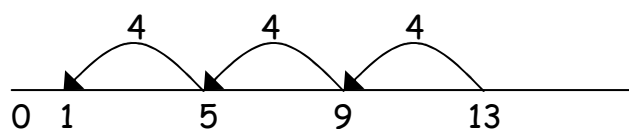
Children will use an empty number line to support their calculation.

$$24 \div 4 = 6$$



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**

$$26 \div 2 = \square$$

$$24 \div \triangle = 12$$

$$\square \div 10 = 8$$