

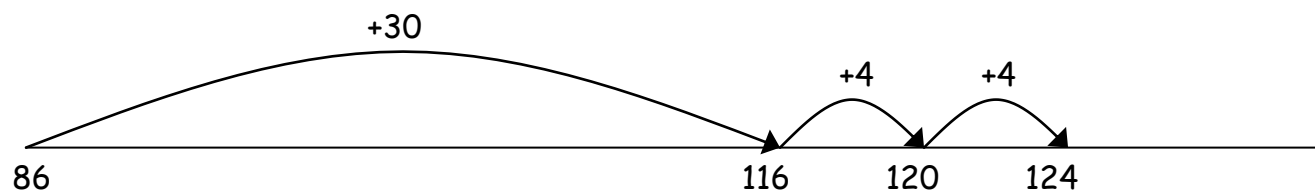
Y3 AND Y4

ADDITION

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

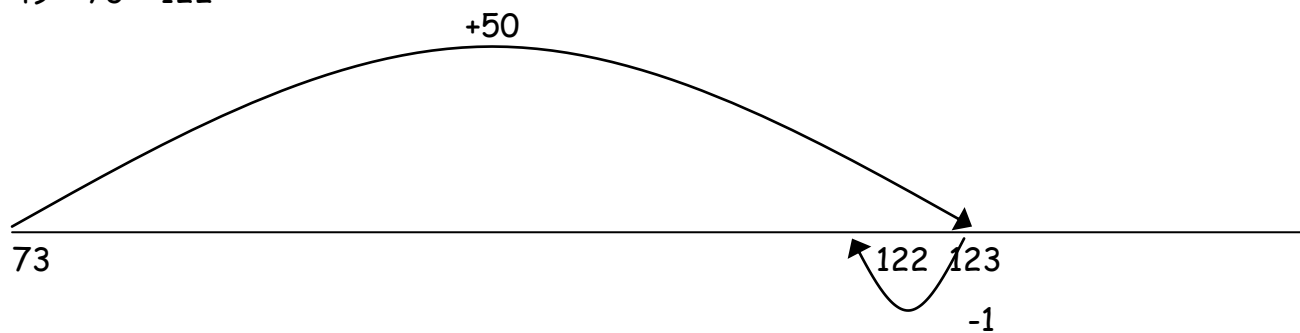
- ✓ Count on from the largest number irrespective of the order of the calculation.

$$38 + 86 = 124$$



- ✓ 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.

$$\begin{array}{r} 625 \\ + 48 \\ \hline 673 \\ 1 \end{array}$$

$$\begin{array}{r} 783 \\ + 42 \\ \hline 825 \\ 1 \end{array}$$

$$\begin{array}{r} 367 \\ + 85 \\ \hline 452 \\ 11 \end{array}$$

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

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

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

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

This method can be demonstrated by the teacher as means of introduction

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

Children would write

$$\begin{array}{r} 89 \\ - 57 \\ \hline 32 \end{array}$$

To introduce decomposition, this will be used as a demonstration method by the teacher

$$\begin{array}{l} \text{Step 1} \quad 70 + 1 \\ \quad \quad - 40 + 6 \\ \hline \\ \text{Step 2} \quad 60 + 11 \\ \quad \quad - 40 + 6 \\ \hline 20 + 5 = 25 \end{array}$$

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

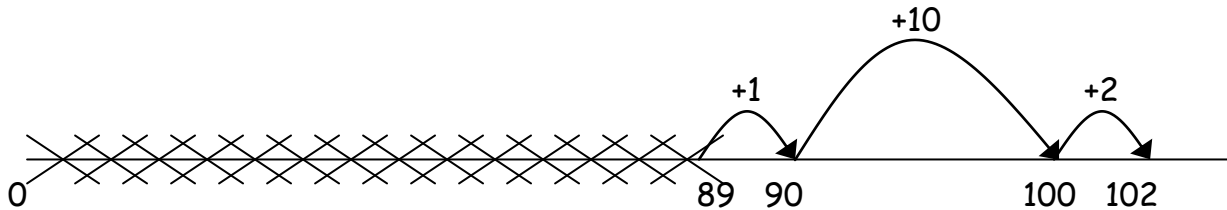
This would be recorded by the teacher as

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

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.

$$102 - 89 = 13$$



Partitioning and decomposition

The partitioning method

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

$$\begin{array}{r} \text{Step 1} \quad 700 + 50 + 4 \\ - \quad \quad \quad 80 + 6 \\ \hline \end{array}$$

$$\begin{array}{r} \text{Step 2} \quad 700 + 40 + 14 \quad (\text{adjust from } T \text{ to } U) \\ - \quad \quad \quad 80 + 6 \\ \hline \end{array}$$

$$\begin{array}{r} \text{Step 3} \quad 600 + 140 + 14 \quad (\text{adjust from } H \text{ to } T) \\ - \quad \quad \quad 80 + 6 \\ \hline 600 + 60 + 8 = 668 \end{array}$$

This would be recorded by the children as decomposition

$$\begin{array}{r} 614 \\ \underline{7} \cancel{5} 4 \\ - 86 \\ \hline 668 \end{array}$$

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.

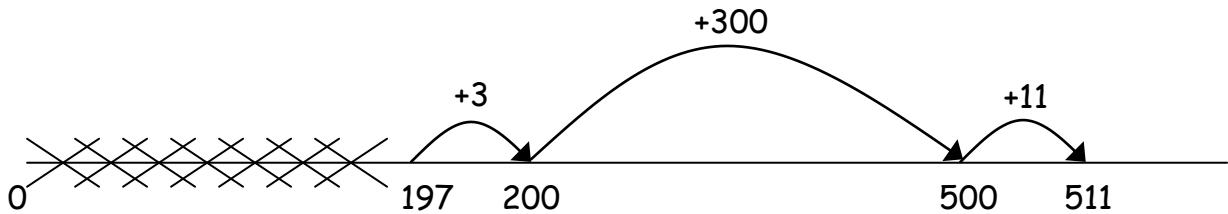
For example:

$$\begin{array}{r} 7 1 \\ 8 \cancel{8} 5 \\ - 4 \cancel{3} 8 \\ \hline \end{array}$$

Alternatively, children can set the amounts to whole numbers, i.e. 895 - 438 and convert to pounds after the calculation.

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.

$$511 - 197 = 314$$



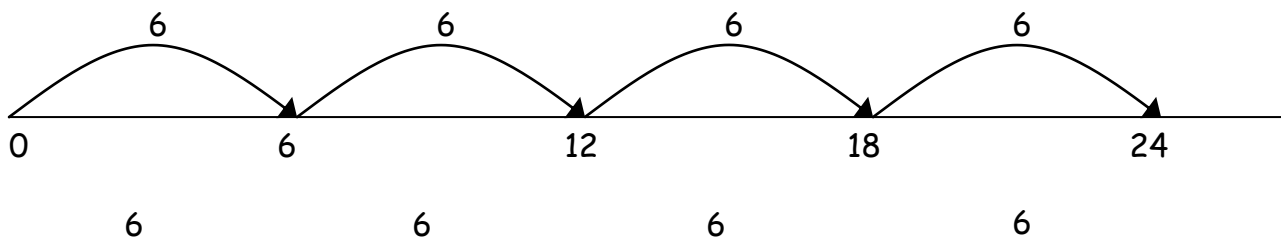
MULTIPLICATION

Children will continue to use:

✓ **Repeated addition**

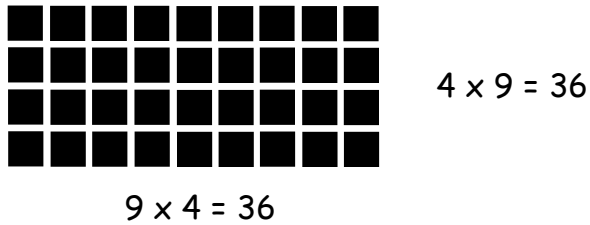
4 times 6 is $6 + 6 + 6 + 6 = 24$ or 4 lots of 6 or 6×4

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.



Children will also develop an understanding of

✓ **Scaling**

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

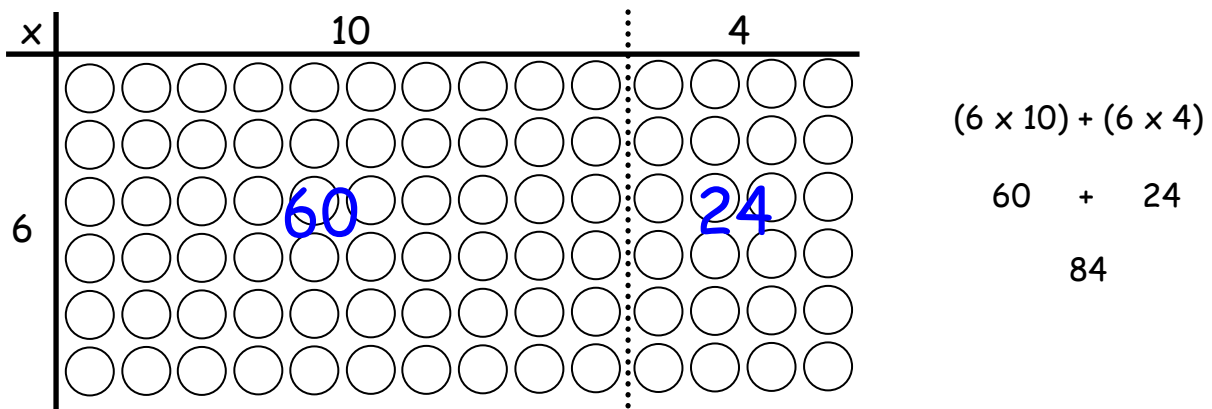


✓ **Using symbols to stand for unknown numbers to complete equations using inverse operations**

$\square \times 5 = 20$ $3 \times \triangle = 18$ $\square \times \circ = 32$

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

This can be used a model for teachers



Grid method

TU × U

(Short multiplication - multiplication by a single digit)

$$23 \times 8$$

Children will approximate first
 23×8 is approximately $25 \times 8 = 200$

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

By the end of Year 4 children should know all of the times tables.

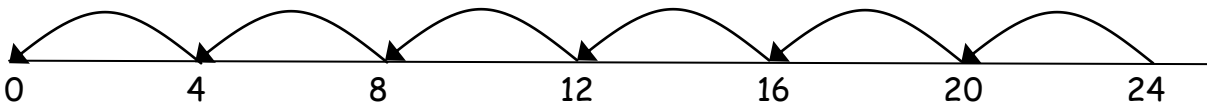
DIVISION

Children will continue to use:

- ✓ **Repeated subtraction using a number line**

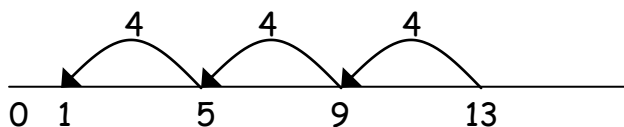
Children will use an empty number line to support their calculation.

$$24 \div 4 = 6$$



Children should also move onto calculations involving remainders.

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

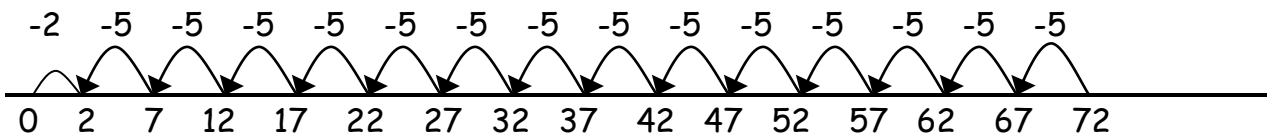


- ✓ Using symbols to stand for unknown numbers to complete equations using inverse operations

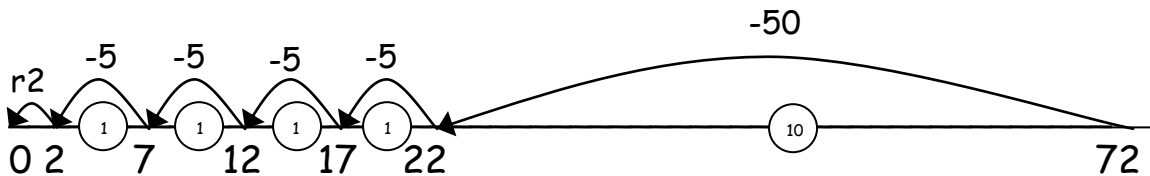
$$26 \div 2 = \square \qquad 24 \div \triangle = 12 \qquad \square \div 10 = 8$$

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.

$$72 \div 5$$



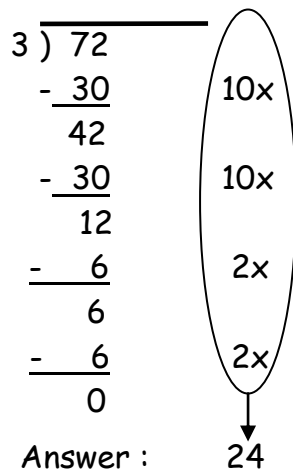
Moving onto:



Then onto the vertical method:

Short division TU ÷ U

$$72 \div 3$$



Leading to subtraction of other multiples.

$$96 \div 6$$

$$\begin{array}{r} 16 \\ \hline 6 \overline{) 96} \\ \underline{- 60} \\ 36 \\ \underline{- 36} \\ 0 \end{array}$$

10x
6x
↓
Answer : 16

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. For example $62 \div 8$ is 7 remainder 6, but whether the answer should be rounded up to 8 or rounded down to 7 depends on the context.

e.g. I have 62p. Sweets are 8p each. How many can I buy?

Answer: 7 (the remaining 6p is not enough to buy another sweet)

Apples are packed into boxes of 8. There are 62 apples. How many boxes are needed?

Answer: 8 (the remaining 6 apples still need to be placed into a box)