

# Bewley Primary School



## PROGRESSION THROUGH CALCULATIONS FOR ADDITION

Written methods for addition of whole numbers

The aim is that children use mental methods when appropriate but, for calculations that they cannot do in their heads, they use an efficient written method accurately and with confidence.

**To add successfully, children need to be able to:**

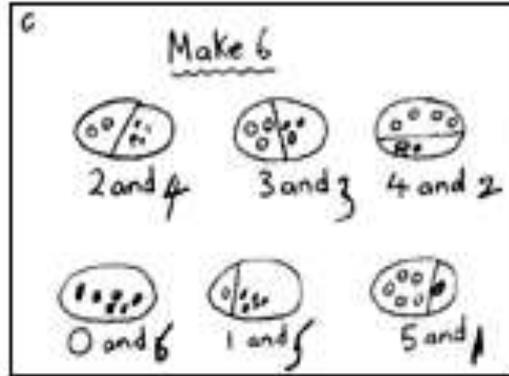
- recall all addition pairs to  $9 + 9$  and complements in 10, (such as  $\square + 3 = 10$ );
- add mentally a series of one-digit numbers, (such as  $5 + 8 + 4$ );
- add multiples of 10 (such as  $60 + 70$ ) or of 100, (such as  $600 + 700$ ) using the related addition fact,  $6 + 7$ , and their knowledge of place value;
- partition two-digit and three-digit numbers into multiples of 100, 10 and 1 in different ways, and extend this strategy for larger and decimal numbers.

**It is important that children's mental methods of calculation are practised and secured alongside their learning and use of an efficient written method for addition.**

**Children should also be encouraged to approximate before calculating and check whether their answer is reasonable.**

## RECEPTION

Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They should experience practical calculation opportunities using a wide variety of equipment, e.g. small world play, role play, counters, cubes etc. They develop ways of recording calculations using pictures, etc.



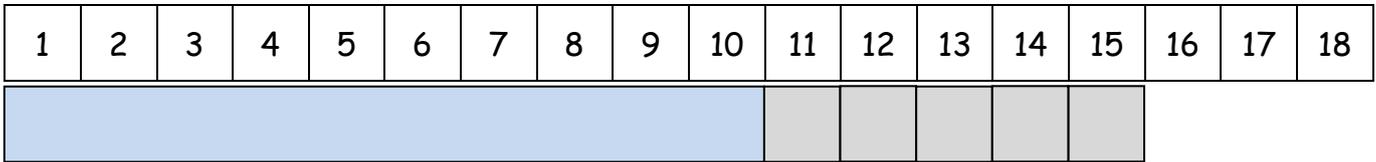
Children **who are ready** may record this as:

$$2 + 4 = 6 \quad 3 + 3 = 6 \quad 6 = 4 + 2 \quad 0 + 6 = 6 \quad 1 + 5 = 6 \quad 5 + 1 = 6$$

## Y1

Children will initially use practical equipment to combine groups of objects to find the total. They will move on to the use of number tracks, base 10 equipment to support their developing understanding of addition.

$$10 + 5 =$$

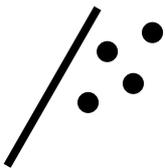


$$10 + 5 = 15$$

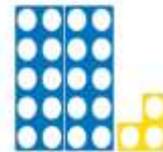
## Y2

Children will continue to use equipment to support their calculations. Children will begin to record their calculations using the equipment as support.

e.g.  $14 + 23 =$



OR



$$14 + 23 = 37$$

They would add the tens first and then count on the units.

When the units total more than 10, children should be encouraged to exchange 10 ones for 1 ten. This is the start of children understanding 'carrying' in vertical addition.

## Y3

Children will build on their knowledge of using Base 10 equipment or Numicon from Y2 and if necessary continue to use this to support with the transition into a vertical method.

Children should complete calculations with up to three digits, adding the **least significant digits** first as preparation for the columnar method of addition method.

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

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

## Y4

Based on their experiences in Y3, children should add numbers with up to 4 digits using the efficient method of columnar addition.

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

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

$$\begin{array}{r} 3367 \\ +7285 \\ \hline 10652 \\ 1 \quad 11 \end{array}$$

$$\begin{array}{r} \text{£}3.48 \\ + \text{£}0.78 \\ \hline \text{£}4.26 \\ 1 \quad 1 \end{array}$$

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.
- Solve two-step problems in contexts

## Y5

Children should extend the carrying method to numbers with more than 4 digits.

$$\begin{array}{r} 587 \\ + 475 \\ \hline 1062 \\ 1 \quad 1 \end{array}$$

$$\begin{array}{r} 233587 \\ + 16675 \\ \hline 250262 \\ 11 \quad 11 \end{array}$$

Using similar methods, children will:

- add several numbers with different numbers of digits;

- *begin to add two or more decimal fractions with up to three digits and the same number of decimal places;*
- *know that decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. 3.2 m + 280 cm.*
- *solve addition multi-step problems in different contexts*

## **Y6**

Children should extend the carrying method to several numbers with any number of digits.

*Using similar methods, children will*

- *add several larger numbers with different numbers of digits;*
- *begin to add two or more decimal fractions with up to four digits and either one or two decimal places;*
- *know that decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. 401.2 + 26.85 + 0.71.*
- *use estimation to check answers to calculations and determine, in the contexts of a problem, levels of accuracy*
- *continue to practise subtraction for larger numbers using efficient methods of columnar subtraction*

**By the end of year 6, children will have a range of calculation methods, mental and written. Selection will depend upon the numbers involved.**

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