ADDITION

At the beginning of Primary School, children are encouraged to develop a mental picture of the number system in their heads to aid calculation. They develop ways of recording calculations using pictures and concrete materials/objects.

Number songs, rhymes and the context of play are used to engage and reinforce across a range of learning styles.

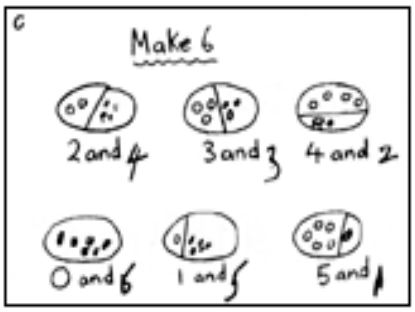
They learn to count objects accurately in a line or a group.

Children understand adding as the concept of 'more' or a total.
e.g. Add some more water to the tank. What do you think will happen?

The use of symbols such as '+ and - are introduced early on when developing and solving a number sentence, such as 4 + 2 = 6

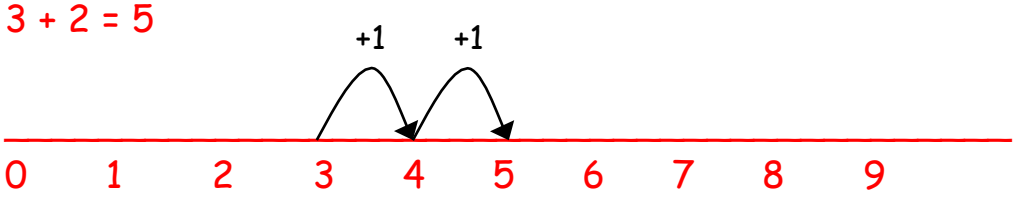
Familiarity with number bonds to 10 are encouraged and explored, e.g.
0+10 = 10, 1+9 = 10, 2+ 8 = 10 and so on.

Children also become familiar with number stories e.g.
0 + 6 = 6
1 + 5 = 6
2 + 4 = 6
3 + 3 = 6



They use number lines and practical resources to support calculations and teachers *demonstrate* the use of the numberline.

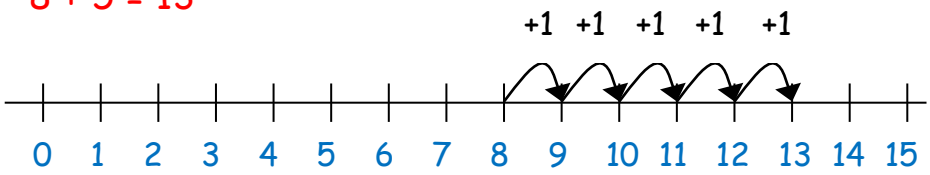
3 + 2 = 5



Children then begin to use numbered lines to support their own calculations using a numbered line to count on in ones.

Children are encouraged to put the biggest number in their heads and count on.

8 + 5 = 13



They then begin to develop a range of written and mental approaches.

Using known facts to work out other calculations

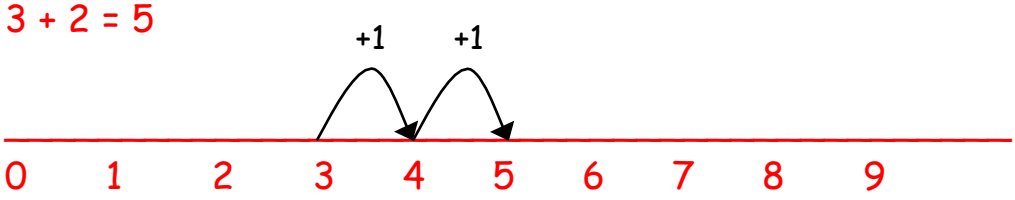
Known doubles facts such as 3 + 3 = 6 are used as a point of reference to work out other calculations. Near doubles for example,
3 +2 = double 3 – 1 = 5
OR
3 + 4 = double 3 + 1 = 7

Adding 10s is used in a similar way. For example,
3 + 2 = 5,
so 13 + 2 = 15, 23 +2 = 25, 33 + 2 = 35 etc

These calculations are represented visually on a hundred square.

They use number lines and practical resources to support calculations and teachers *demonstrate* the use of the numberline, counting up in 1s and 10s.

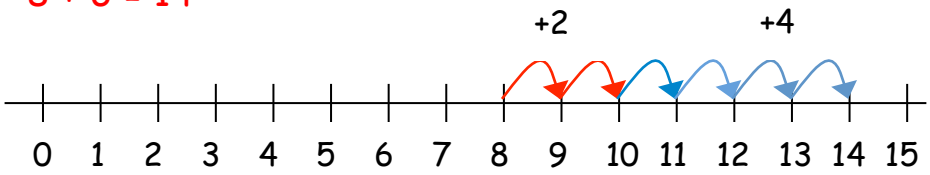
3 + 2 = 5



Children are encouraged to put the biggest number in their heads and count on to the next multiple of 10 then add the remaining amount.

8 + **2** = 10 + **4** = 14 because 2 + 4 = 6

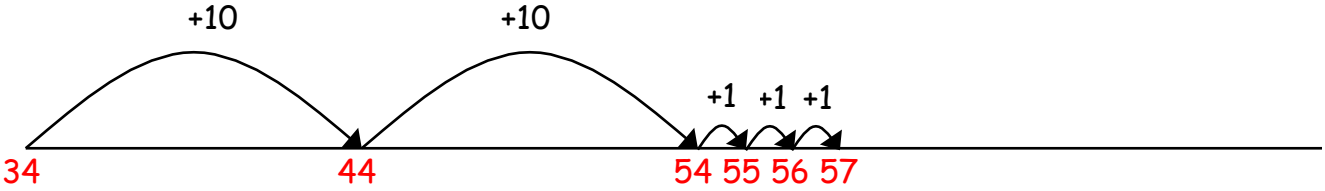
8 + 6 = 14



Children will begin to use 'empty number lines' themselves starting with the larger number and counting on.

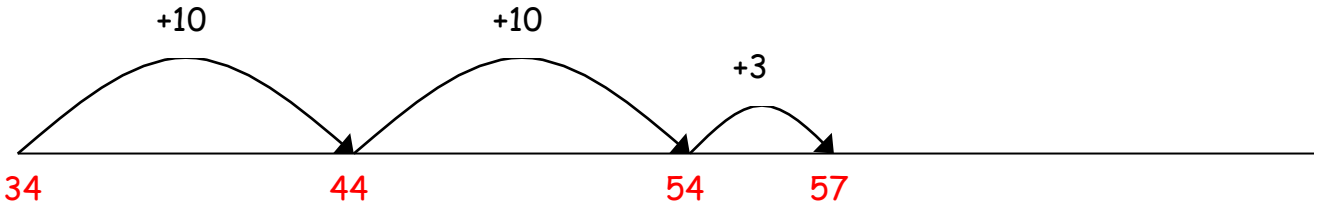
First counting on in tens and ones.

34 + 23 = 57



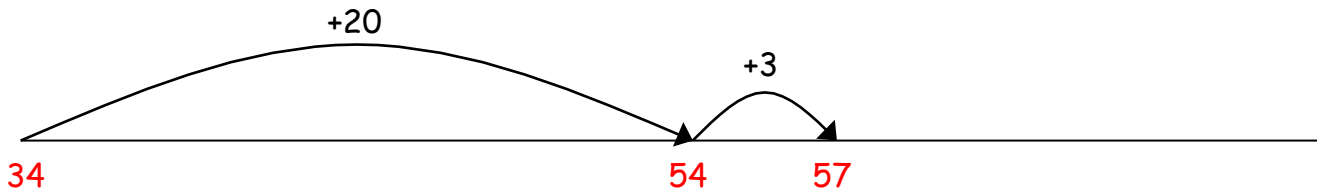
Then helping children to become more efficient by adding the units in one jump.

34 + 23 = 57



✓ Followed by adding the tens in one jump and the units in one jump.

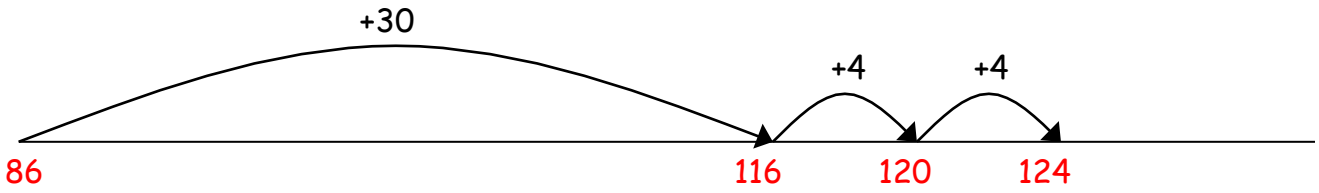
34 + 23 = 57



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

They will be encouraged to count on from the largest number irrespective of the order of the calculation.

38 + 86 = 124



Children will learn to apply their knowledge of place value to **partition** the numbers being added and then progress to a **column** method, carrying below the line when required, as shown below.

Example 1) *27 + 36* Example 2) *243 + 68*

Partitioning method

20 + 30 = 50
7 + 6 = 13
50 + 13 = 63

200 + 0 = 200
40 + 60 = 100
3 + 8 = 11
200 + 100 + 11 = 311

Column method

$$\begin{array}{rr} & 2 \quad 7 \\ + & 3 \quad 6 \\ \hline & 6 \quad 3 \\ & 1 \end{array}$$

$$\begin{array}{rrr} 2 & 4 & 3 \\ + & 6 & 8 \\ \hline 3 & 1 & 1 \\ 1 & 1 & \end{array}$$

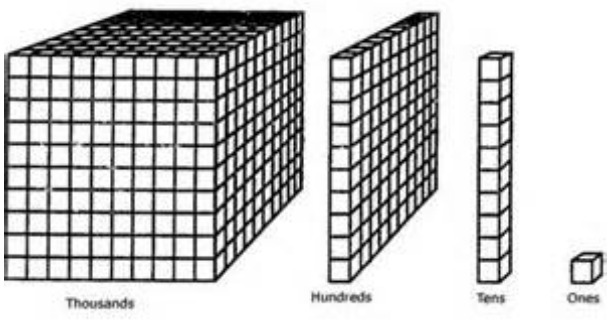
In example 1, the column method is worked out as follows;

Step 1
In the right hand column, add the units (or 1s). 7 + 6 = 13. Place the **3** from the answer 1**3**, in the units (or 1s) column and place the **1** (1 ten) from the answer **1**3 under the tens column, to be added later. This is because only the units or 1s can be recorded in the units column. 13 is made up of 1 ten and 3 units, so the 1 ten needs to be added in the tens column where it belongs.

Step 2
In the tens column, add 2 tens + 3 tens. Also remember to add the 1 ten that you carried from the previous column. 2 + 3 + 1 = 6 tens. Place the 6 in the answer box in the tens column.
The answer is 63.

In Example 2, the carrying continues into the hundreds column as shown and so on depending on the size of the numbers being added.

When introducing numbers to 100, we use Dienes materials to support as well as number squares.



As the children develop their adding skills, they consolidate a range of written and mental approaches and develop a greater degree of flexibility with more challenging numbers, including decimals.

Using similar methods, children will:

- ✓ add several numbers with different numbers of digits;
- ✓ know that the decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. £45.12 + £3.71

$$\begin{array}{r} 6584 \\ +\ 5848 \\ \hline 12432 \\ \hline 1\ 1\ 1 \end{array}$$

$$\begin{array}{r} 45.12 \\ +\ 3.71 \\ \hline 48.83 \end{array}$$

$$\begin{array}{r} 42 \\ 6432 \\ 786 \\ 3 \\ +\ 4681 \\ \hline 11944 \\ \hline 1\ 2\ 1 \end{array}$$

<u>Note:</u> It is vitally important that children use the squares in their jotters to help them line up the digits in the correct place.

The decimal point should be 'dropped' into the answer line in order to keep the correct place.

- ✓ Children should be encouraged to approximate/estimate their answers before calculating.
- ✓ Children should be encouraged to check their answers after calculation using an appropriate strategy.
- ✓ Children should be encouraged to consider if a mental calculation would be quicker before using written methods.

Children will aim to work out mentally that:

324 + 58 = 382 because it is 320 + 50 = 370 and 4 + 8 = 12, or 370 + 12 = 382

Or use partitioning to mentally solve calculations such as 5.6 + 3. 7 = 12.3

5 + 6 = 11

0.6 + 0.7 = 1.3

11 + 1.3 = 12.3