Overview of Addition at Hanley St Luke's

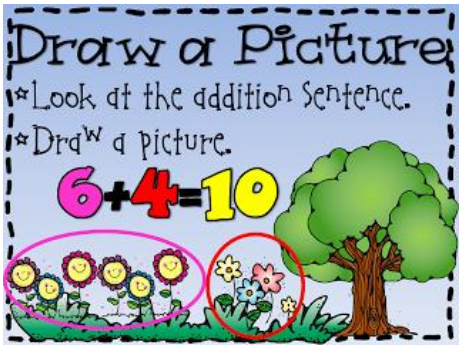
- Children at Hanley St Luke's are immersed in a number of different addition calculation strategies according to their needs and abilities. The overall aim is to ensure that children will use both written and mental methods to solve problems, choosing their own 'best fit' method. The journey is towards column addition and 'carrying' in written methods, and confidence/ accuracy when mentally adding.

- Children working at P levels will use visual pictures and objects to 'add on' and answer questions such as 'How many more to make 5?', 'What is the total..?' 'Can you add 1 on?' and so on. They should understand addition as 'adding on' noticing the total increasing.

- The mental methods that lead to column addition generally involve counting on in single digit numbers, adding the smaller number to the larger number, leading onto counting on in multiples of 10, possibly using a number square with an awareness that addition calculations can be performed in any order. With continued practice and reinforcement, children will become very comfortable using counting on methods on a number line which will provide a solid base to move on to more difficult concepts and methods.

<u>Counting groups of objects and pictures</u>

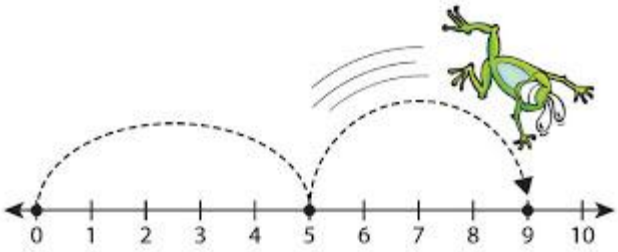
Children physically add on to groups of objects i.e. teddy bears, numicon, counters or other sorting objects. They would then move on to adding on with pictures through drawing, matching and cut and paste activities. Encourage the use of correct vocabulary with questions such as: What does number 5 look like? (Have students represent this with counters or unifix cubes) Which number comes next?
How many more do you need to reach 10? Etc.



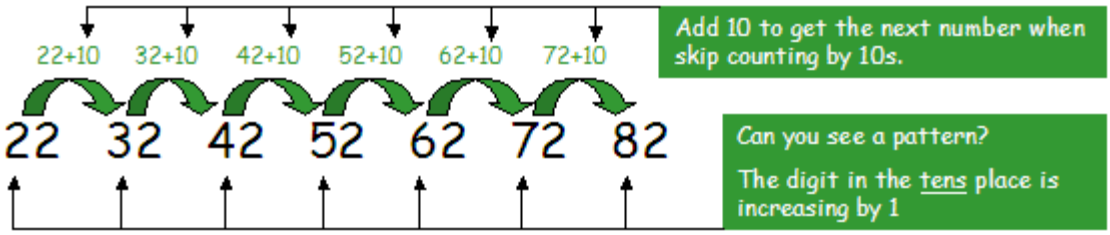
Counting on using the number line.

This should be an early stage for the process of addition. A concrete visual image is provided and children can see that the number is getting greater as they count forward.

Example 1: 5 + 4 = 12



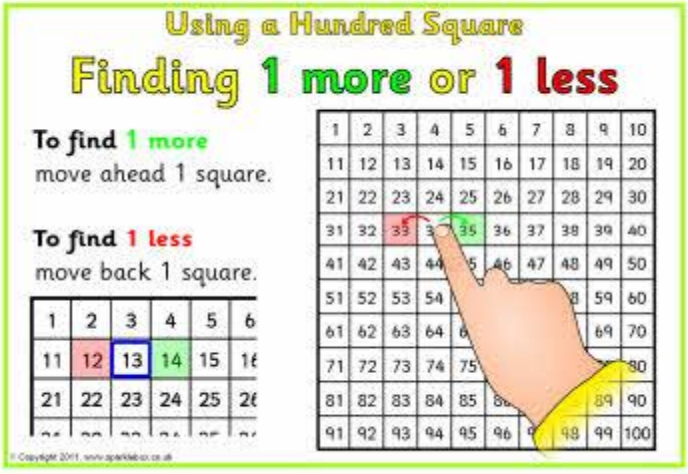
Example 2: 22 + 60 = 82



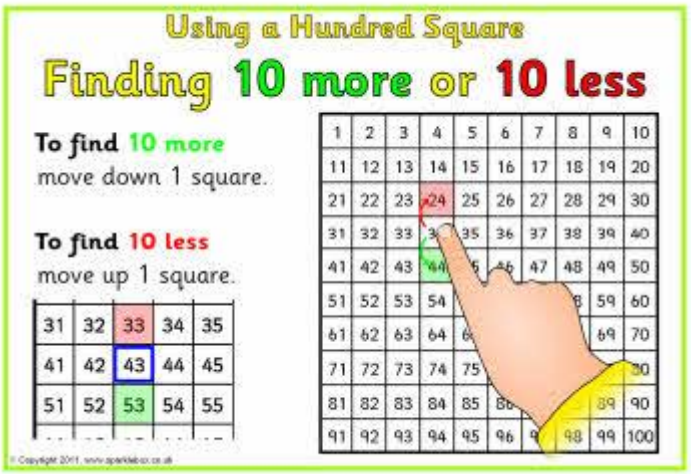
The steps forwards may be recorded by the children in any way, the number line works from the left, in reverse to the subtraction number line which works from the right to ensure the children see the number is getting bigger.

Counting on using the number square

Example 3: 34+1=35



Example 4: 34+10=

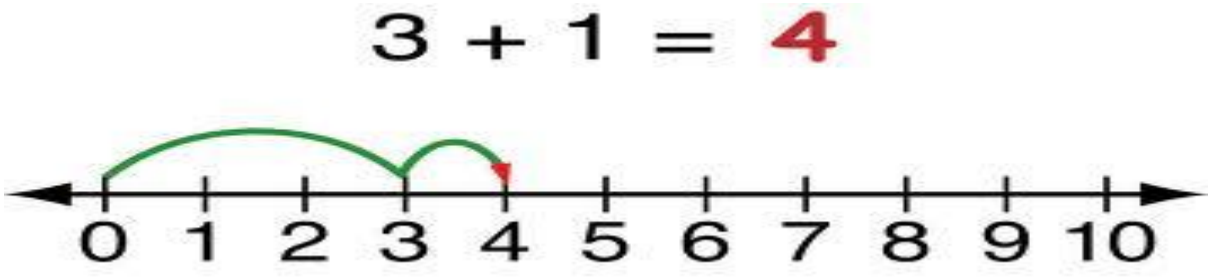


Children can then apply the skills of moving up/down/left and right to add on in multiples of 1 and 10. E.g. 35+57=

Hundred squares are used as a visual tool, children can also complete blank hundred squares, match jigsaw pieces, count up and down in tens and ones to become familiar with number patterns and bonds to multiples of ten.

Fully Numbered Lines

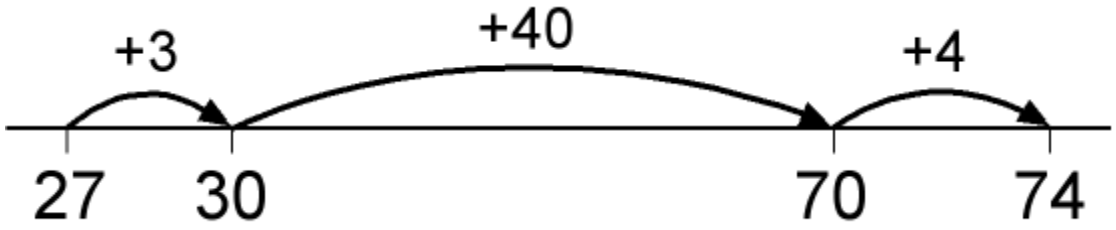
The mental method of counting up from the smaller to the larger number can be recorded using given numbered lines. More simple calculations are carried out through this method for example 15+8= The children will count in steps of 1 to support with mental reasoning. When mastered, children move on to empty number lines.



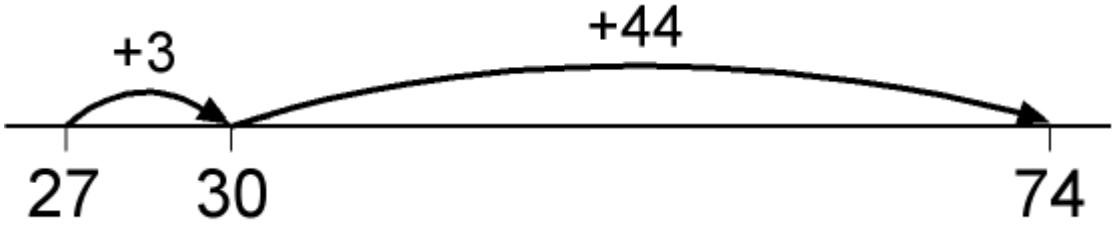
Empty Number Line method

The mental method of counting up from the smaller to the larger number can be recorded using number lines. Children usually find it easiest to make the first jump to the next 10. The number of jumps will vary. For some children, they will find it comfortable to make only two jumps along the line. Others will need more.

Example 5: 74 + 27=47

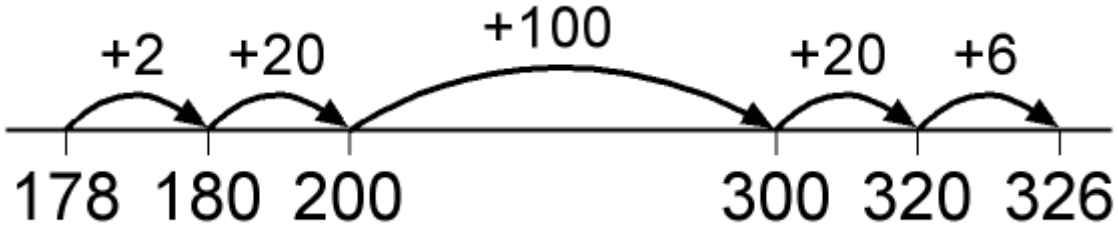


Others will need fewer jumps, especially when they become confident with the method.

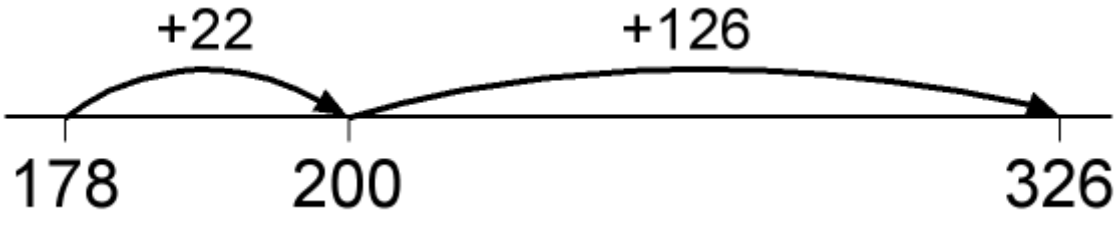


For 3 digit numbers:

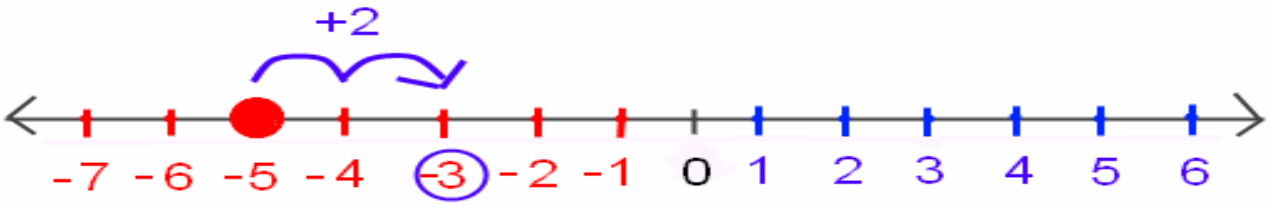
Example 6: 326 + 178=148



leading to:



Adding negative numbers on a number line



The same principles can be applied when adding negative numbers to show the children that they are making 'jumps'.

Partitioning

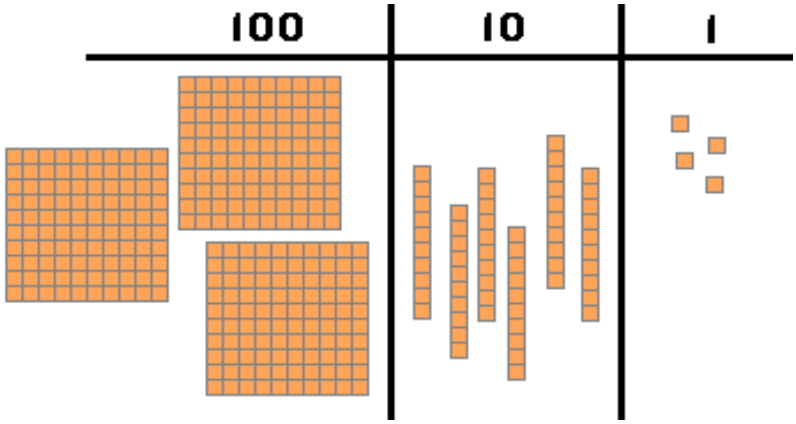
Children will physically partition numbers into tens and units.

e.g. 47+45=

40+40= 80

7+5= 12

80+10+2= 92



e.g. 147+176=

100+100= 200

40+70= 110

7+6= 13

200+100+13= 323

When the three answers are worked, they are then recombined to give the total. Numicon and Cuisenaire rods etc can be used for visual representation.

Column Addition

```
  TU
  14
+  2
----
  16
```

Begin by clearly labelling the place value columns, and then as the children become confident, they can then choose to drop the headings. Start on the right hand side and add the digits together, starting with the larger number.

Leading to:

```
  14
+ 12
----
  26
```

This will then lead to 'carrying' or 'adding' numbers below the total, from the adjacent column or 'next door':

$$\begin{array}{r} 25 \\ +\ 46 \\ \hline 71 \\ 1\ 1 \end{array}$$

Moving on to crossing the hundreds boundary.

$$\begin{array}{r} 68 \\ +\ 49 \\ \hline 117 \\ 1\ 1 \end{array}$$

Here the eight and nine have been added to make 17, the 7 is placed in the units column, and the '1' ten has been 'carried' next door. Ensure children know that you are not always carrying 1, but 10, 100 and so on depending on the calculation.

The 'carried' values should always be written below the number next door, in the correct column.

The same rule applies when adding larger numbers where 0 is a place holder.

These methods can be applied to calculations with **any number of digits** and decimal numbers, including numbers with different number of digit, also with units such as pounds and pence, grams and kilograms, litres and millilitres etc.

Missing Number/ Equal sign as a Balance

Children should always be used to seeing addition calculations in a variety of different ways, including the understanding of the role of the equals sign as a balance. Missing numbers need to be placed in all possible places.

$9 + 4 = \square$ $\qquad$ $\square = 13 + 4$

$3 + \square = 6$ $\qquad$ $8 = \square + 4$

$\square + 4 = 7$ $\qquad$ $19 = 3 + \square$

$\square + \nabla = 48$ $\qquad$ $45 = \square + \nabla$

Worded Problems

Children should be used to using and applying their addition skills in a number of different ways and, where relevant in other areas of the curriculum. They should be able to recognise the vocabulary of addition and solve problems using age and ability appropriate methods.