<u>Progression for Addition</u>

DEVELOPING UNDERSTANDING AND MENTAL METHODS

- Use developing mathematical ideas and methods to solve practical problems involving **<u>counting</u>** and **<u>comparing</u>** in a real or role play context using models and images to support learning.
- Use rhymes, stories and songs to introduce mathematical concepts.
- Children develop ways of recording calculations using Numicon, pictures, fingers, ten frames, number tracks and bead strings etc.
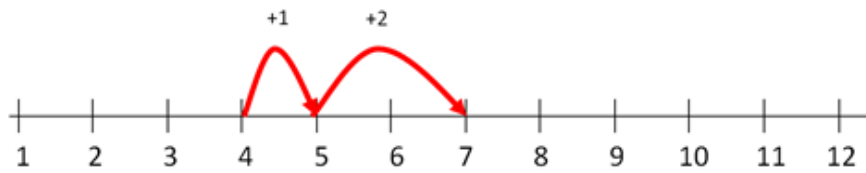

- Say how many there are when two groups of objects are combined to make a total; extend to three groups using imagery combinations of sets to develop understanding.
- Use the part, part whole, bar modelling to support the concept of partitioning in different combinations.
- Begin to use vocabulary involved in addition (more, and, add, make, sum, total, altogether, score… one more, two more…, how many more to make….? How many more is… than…?)
- Can answer questions such as:

What is this number?	Which is more: 4 or 7?
What number: comes after 10?	Is one more than 5, 12? etc.

- Begin to relate addition to counting on. Encourage children to count on from the larger number.
- Uses related vocabulary and symbols to describe and record addition number sentences.
- To recognise that addition can be done in any order; so that mental calculations can be derived more efficiently.
- Understands that more than two numbers can be added together,   6 + 3 + 1 = 10
- Encourage the children to communicate or explain their thinking and reasoning orally and when appropriate in writing.
- Put the larger number first and count on in ones (stepping), including beyond 10, using equipment such as: the bead string, number track or labelled number line.

- **Bridging:** Beginning with developing recall of number facts for 5 then moving to '5 and a bit' e.g. **jumping** on a number line. 4 + 3 = 7 <u>bridging</u> through 5

- **Begin to interpret situations as addition calculations and explain reasoning**, for example, can answer questions such as:

   Lisa has 9 pens and Tim has 7 pens. How many pens do they have altogether?
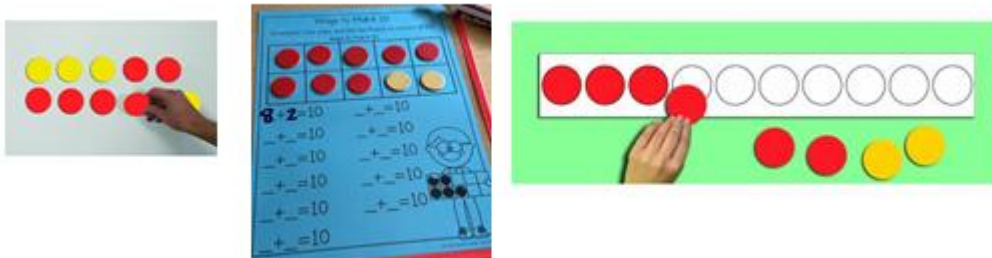
$$9 + 7 = 16$$

9 + 7 =

Children place the Numicon shapes together.

They can check their answer by placing other numicon shapes on top e.g. 10 shape and 6

This is also an example of bridging through 10 using Numicon.

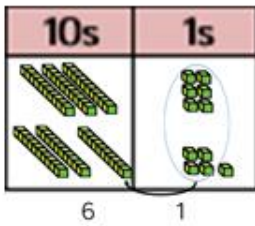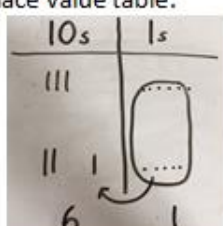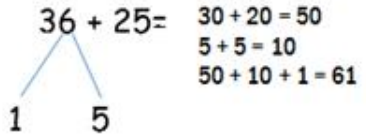- **Partition numbers in different combinations** using double sided counters.

- **Regrouping to make 10**; using ten frames and counters / cubes or using Numicon.

Concrete	Pictorial	Abstract
6 + 5 	Children to draw the ten frame and counters/cubes. 	Children to develop an understanding of equality e.g. $6 + \square = 11$ $6 + 5 = 5 + \square$ $6 + 5 = \square + 4$

- **TO + O using base 10.** Continue to develop understanding of partitioning and place value.

Concrete	Pictorial	Abstract
41 + 8 =	Children to represent the base 10 with sticks for tens and dots for	41 + 8 1 + 8 = 9

- **TO + TO using base 10.** Continue to develop understanding of partitioning and place value.

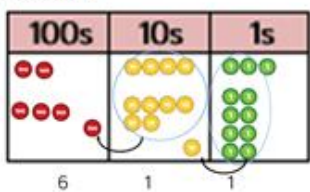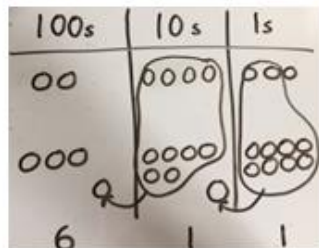| Concrete	Pictorial	Abstract
36 + 25 = **10s** | **1s** (base 10 blocks) 6 1	Children to represent the base 10 in a place value table. 10s | 1s lll ll l 6 l	Looking for ways to make 10. $36 + 25 =$ 1 5 30 + 20 = 50 5 + 5 = 10 50 + 10 + 1 = 61

- **Recall all number bonds to and within 10** e.g.

- Use their knowledge of number bonds to reason with and calculate bonds to and within 20, recognising other associated additive relationships (e.g. If 7 + 3 = 10, then 17 + 3 = 20; if 7 − 3 = 4, then 17 − 3 = 14; leading to if 14 + 3 = 17, then 3 + 14 = 17, 17 − 14 = 3 and 17 − 3 = 14)

Y2 / Y3

- **Use the place value counters to add HTO + TO, HTO + HTO etc.**

Concrete	Pictorial	Abstract
When there are 10 ones in the 1s column – we exchange for one ten, when there are 10 tens in the 10s column – we exchange for 1 hundred. **100s** | **10s** | **1s** (place value counters) 6 1 1	Children to represent counters in a place value table, circling when they make an exchange. 100s | 10s | 1s oo | 0000 | ooo ooo | oooo oo | ooooo 6 1 1	Expanded written method for addition. 160 = 100 + 60 + 8 57 = 0 + 50 + 7 ——————————— 225 = 200 120 15 100 10

- **Conceptual Variation: use different ways to solve calculations** e.g.

21 + 34 =

Expanded Written Method:

$$160 = 100 + 60 + 8$$
$$57 = \quad 0 + 50 + 7$$
$$225 = 200 \; \cancel{120} \; \cancel{15}$$
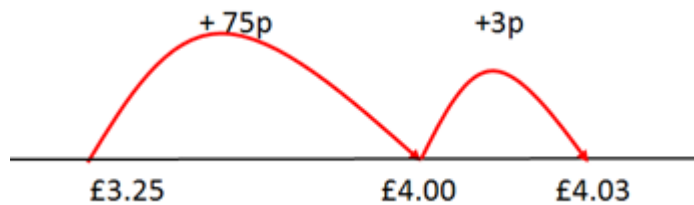$$\; 100 \quad 10$$

The amount of time that should be spent teaching and practising the expanded method will depend on how secure the children are in their recall of number facts and with partitioning.

- Children should be encouraged to check their answers after the calculation using an appropriate strategy.
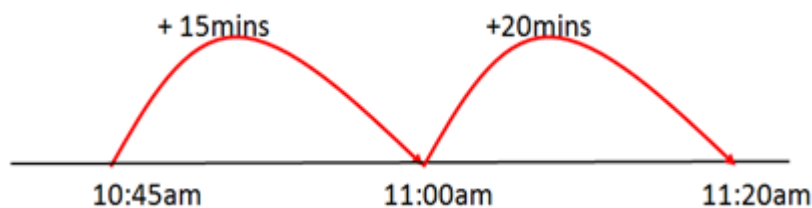
Y3 / Y4 / Y5 / Y6

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

- Until children are confident when using a **written method** for addition and have understanding of decimals they should be encouraged to add two or more digits sums of money or measures using the number line.

£3.25 + 78p or 3.25m + 78cm

- Encourage children to use the number line when solving problems involving time e.g.

Sarah left her home at 10.45am and arrived at the shops 35 minutes later. What time did she arrive? Answer: 11.20am

Standard Written Method / Compact Method

- The method doesn't change but the recording is reduced.
- Only the children who can calculate independently and efficiently with the expanded method should be introduced to the compact method.
- Children should practise this method with no 'carrying' first.

No 'Carrying'	One 'Carry' (Units to tens)
134	625
+ 25	+ 48
159	673
	1

'Carry' digits are recorded below the line using the words 'carry' ten or 'carry' hundred.

Tens to hundreds

```
  541
+293
  834
  1
```

Two 'Carries' - 'ones to tens' and 'tens to hundreds'

```
  376
+ 485
  861
  1 1
```

Extend method to numbers with at least four digits

```
  1 5 8 7            3 5 8 7
+    2 7 5          +1 6 7 5
  1 8 6 2            5 2 6 2
     1 1             1 1 1
```

Use the compact method extending to numbers with any number of digits.

- Use the compact method to add two or more decimal fractions with up to 4 digits and **either** 1 (Yr5) or 2 decimal places (Yr6), inc. money/measures.

Know that the decimal points should line up under each other, particularly when adding or subtracting mixed amounts e.g. 43.2m + 2900cm.

```
  43.2
+ 29.00
  72.20
   1
```

- Children should be encouraged to check their answers after the calculation using an appropriate strategy.