CALCULATION POLICY FOR ADDITION

THE FOLLOWING ARE STANDARDS THAT WE EXPECT THE MAJORITY OF CHILDREN TO ACHIEVE.

Foundation Stage

Working Vocabulary: **add, more, and, make, total, altogether, double, one more,**

Mental strategies

Counting on – **cubes/counters/**fingers and **counting stick**

Recognise numbers to 20 – pictures, counters and cubes

Counting in 1's – counting stick, and verbally

Recognise 1 more than any given number from 1-20.

Number line – moving along number lines with finger/objects

Written methods

Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They develop ways of recording calculations using pictures, etc.
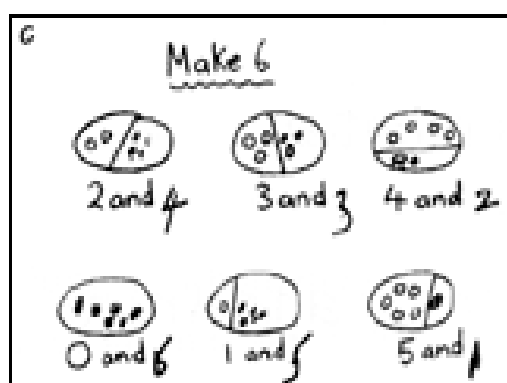
Using visual representations and practical equipment such as **number lines**, counters, cubes and Numicon to solve simple calculations in addition. Record using own pictorial representations and simple number sentences. Understand and use the signs add, and equals.

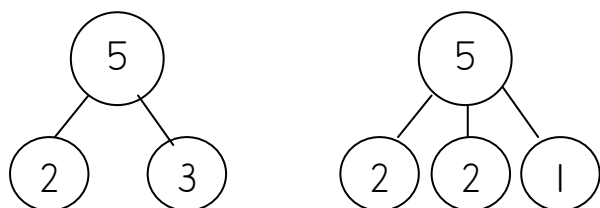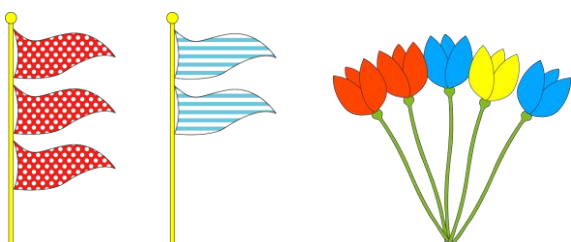| 1	2	3	4	5	6	7	8	9	10

2 +3 = 5 or 3 + 2 = 5

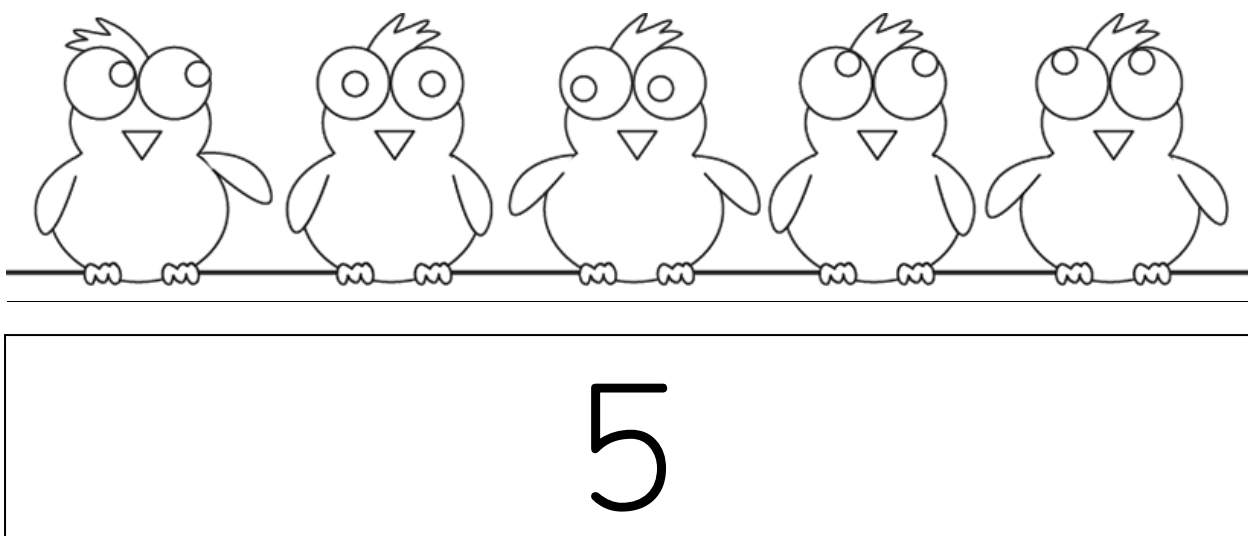Using Numicon as a visual image

4+3 = 7 and 3 + 4 = 7

They will also begin to use the 'Cherry Model' alongside images

5
2   3

5
2   2   1

And understand the basics of the 'Bar Model' alongside pictorial models

5

3	2

ITP Number Facts

Year 1

Working vocabulary as previous year

New vocabulary plus, sum, how much more is? Double, near double, 2 more, 10 more.

Mental Strategies

Counting in 10's and 2's – **counting stick** and verbally

Number bonds to 5 and 10 – **counters, cubes**, fingers and pictures

Doubles – as repeated addition, using counters, cubes, pictures

Place value – using **TU cards, arrow cards**

100 square – finding patterns and what comes next

Crossing the 10's barrier -

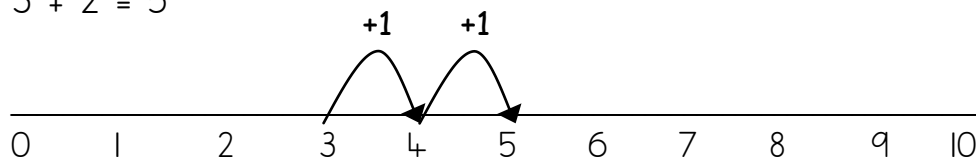**Number lines** – moving along number lines

1 more than – using **100 square/number line**

10 more than – using 100 square/ number line
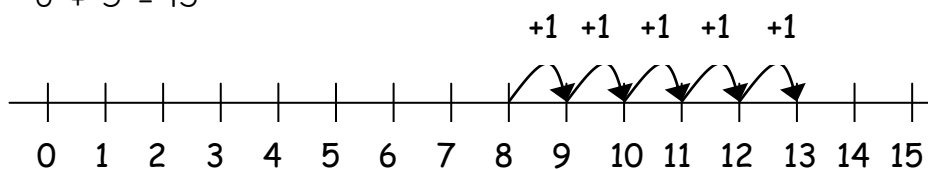
Images below are used to support mental strategies.

They use number lines and practical resources to support calculation and teachers *demonstrate* the use of the **bead string** and number line and practise using it.

3 + 2 = 5
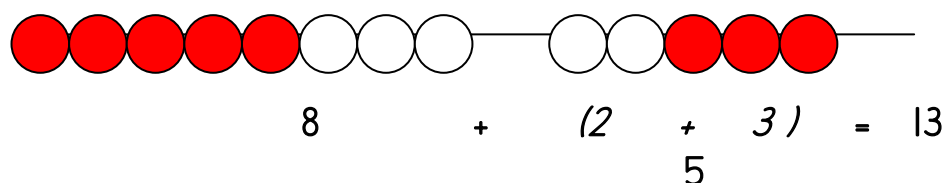
Children then begin to use numbered lines to support their own calculations using a numbered line to count on in ones.

8 + 5 = 13

Bead strings or bead bars can be used to illustrate addition including bridging through ten by counting on 2 then counting on 3.

8 + (2 + 3) = 13

5

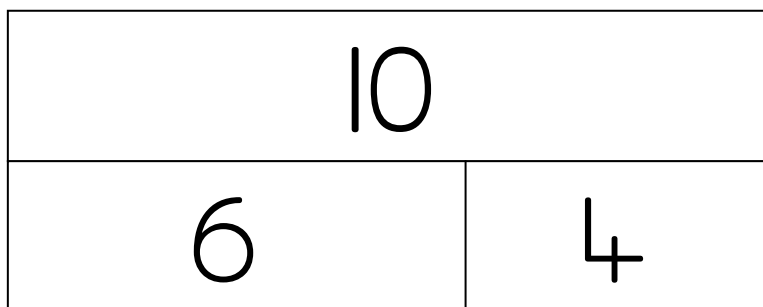Continue use of 'Cherry Model'   alongside written calculations
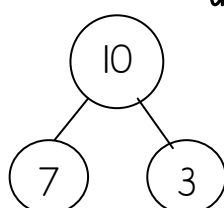
10=7+3

10=3+7

10-3=7

10-7=3

Bar Model used to show numbers bonds to 10 and their inverse

10	
6	4

6+4=10
4+6=10
10-6=4
10-4=6

ITP number line
ITP place value

Year 2

Working vocabulary same as previous years

New vocabulary addition, 100 more, hundreds boundary, operation, inverse, sequence.

Mental Strategies

Addition facts to 20 — digit cards, counters, cubes

Near doubles — counters, cubes

Place value — HTU cards, arrow cards

Multiples of 10 — 100 square and verbally

Partitioning — arrow cards

Add near numbers to multiples of 10, number lines

Crossing the 100's barrier

Rounding to 10 — number lines, rulers

Written Methods

Children use hundred squares to count in tens and units once children are secure with partitioning.

Children can record informal jottings to support their mental calculations using base 10.

For example:

37+15=

37+10=47

47+5=52

Adding the least significant digits first

```
   67        and       (60 + 7)
 + 24                  (20 + 4)
  11 ( 7 +  4)
  80  (60 + 20)        80 + 11
  91                      91
```

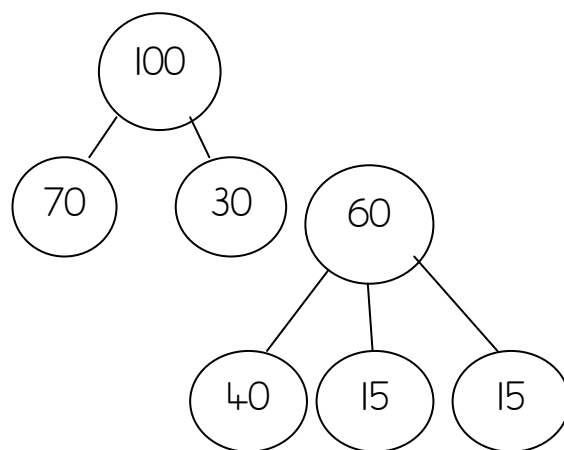Continued use of Bar and Cherry models alongside calculations

ITP number line   ITP Place Value

ITP counting on   ITP Number Grid

Working vocabulary as previous years

New vocabulary **calculate, approximately.**

Mental strategies

Addition facts to 100 – **digit cards, number lines**

Multiples of 10/100 – number line, sorting digit cards

Partitioning – arrow cards,

Place value – **ThHTU cards**

Doubles of numbers up to 50

Rounding 2 digits to 10 – ThHTU cards

Rounding 3 digits to 100 – ThHTU cards

Written Methods

Children will begin to use informal pencil and paper methods (jottings) to support, record and explain partial mental methods building on existing mental strategies. Firstly, using the horizontal partitioning method and then leading on to a vertical method.

67 + 24,

60 + 20 = 80,

7+ 4 = 11

80 + 11 = 91

Consolidating adding the least significant digits first

```
    267              and      (200 + 60 +7
  +  85                          (80 + 5)
     12  ( 7  +  5)      200 + 140 + 12   = 352
    140  (60 + 80)
    200
    352
```

From this, children will begin to carry below the line.

```
      625                    783                    367
    +   48                 +   42                 +   85
      673                    825                    452
        1                      1                     1 1
```

Chn will use the bar model to find missing parts and totals

147	
98	?

?		
62	39	22

ITP beadsticks

Working vocabulary as previous years

New vocabulary **increase**

Mental strategies

Addition facts to 100 — digit cards, **number lines**

Counting in fractions and decimals

Negative numbers

Partitioning — **arrow cards**

Place value — **HTu,TTh,Th,H,T,U. t, h cards**

Doubles of numbers up to 100

Near double/adjust

Multiples of 10/100/1000 — number lines

Rounding to the nearest 10, 100, 1000

Rounding 1 or 2 decimal places to whole numbers

Written methods

First the children will

```
   1625
 +  348
     13
     60
    900
   1000
   1973
```

From this, children will begin to carry below the line.

```
  1625            1783            3367
 +  348          +  142          +2485
   1973            1925           5752
     I               I             I I
```

Written methods

Children will use the Bar Model to recognise equality finding the total and missing numbers

1478	
897	?

?	
862	379

Using similar methods, children will:

✓ add several numbers with different numbers of digits;
✓ begin to add three or more four-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.
✓ Use the inverse operations to check answers
✓ Choose the most efficient method

2 5 6 8 3 5 7 + 4 4 0 0 2 2 Largest number to go on the top	£ 24 .2 1 + £ 73 .8 7 £ 98 . 0 8 1

Year 5

Working vocabulary as previous years

New vocabulary

Mental strategies

Addition facts – **digit cards, number lines**

Partitioning – **arrow cards**

Counting in tenths , hundredths and fractions

Place value – M, HTh, TTh, Th,H,T,U . t, h, **cards**

Doubles of number up to 1000

Near numbers – number lines

Rounding HTU to nearest 10

Rounding ThHTU to nearest 100

Use rounding to check accuracy

Written Methods

Children should extend the carrying method to numbers with 4 digits and beyond

```
   3587              13587
 + 5475            + 5675
   9062            19262
   1 1             1 1 1
```

Using similar methods, children will:

✓ add several numbers with more than four 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.

DECIMALS: Add two or more decimal fractions with <u>one decimal place</u>.	DECIMALS: Add two or more decimal fractions with <u>two decimal places</u>.

  2 . 8 Km
  7 . 5 Km
+ 4 . 6 Km
1 4 . 9 Km
   1
	
	  3 . 2 5 litres
	  7 . 2 7 litres
	+ 5 . 4 9 litres
	1 6 . 0 1 litres
	   1 2

Addition of fractions with the same denominator and the denominators that are multiples of the same number

3/8 + 2/8 = 5/8   4/20 + 6/20 = 10/20 = 1/2

Year 6

Working vocabulary as previous years

New vocabulary

Mental strategies

Addition facts – **number lines**

Partitioning – **arrow cards**

Place value – **M,HTh,TTh,Th,H,T,U. t,h,th cards**

Counting on in tenths, hundredths, thousandths, and fractions.

Doubles

Near numbers – number lines

Rounding .th to .t

Written methods

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

```
    7648              6584                 42
  + 1486            + 5848               6432
    9134             12432                786
    1 1 1            1 1 1                  3
                                       + 4681
                                        11944
                                        1 2 1
```

Using similar methods, children will

✓ _add several 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._

```
  4 0 1 . 2
    2 6 . 8 5
+     0 . 7 1
  4 2 8 . 7 6
          1
```

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 not be made to go onto the next stage if:

1) they are not ready.
2) they are not confident.

Children should be encouraged to approximate their answers before calculating.

Children should be encouraged to check their answers after calculation using an inverse strategy.

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