Addition

Early Years
In the Early Years there is a big emphasis on the children using practical materials as much as possible to aid them in their learning.

Counting
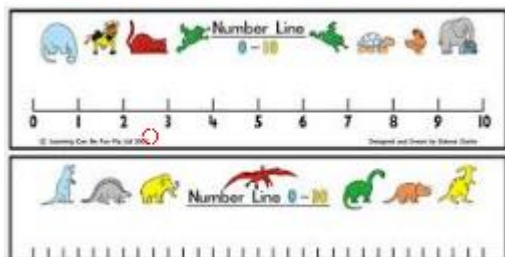There is a big emphasis on counting with the children:
Counting various objects both in pictures and everyday objects

Counting actions e.g. how many jumps did you do or see?
Counting in number rhymes and songs. E.g. Ten green bottles sitting on the wall
Counting on using a number line and finding one more than.

Adding
Comparing groups of objects and separates and realising totals can be the same. E.g. 3 + 2 = 5 or 2 + 3 =5

Numicon
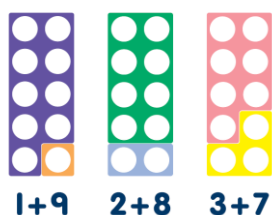Using Numicon to explore concept of number and addition.

Year 1

Children continue to use Numicon and other practical counting resources to aid them in addition.
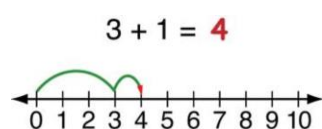
Number bonds using Numicon

By the end of Year 1 all children should know all number bonds to 10 and some of the children will know some number bonds to 20.

1+9   2+8   3+7

Number lines and hundred square

The children are encouraged to use a number line or hundred square to jump on when adding always starting from the larger number. (Number lines to 10, 20, 30 and eventually 100 are available for the children to use)

$$3 + 1 = 4$$

0 1 2 3 4 5 6 7 8 9 10

Missing numbers

The children solve simple problems with missing numbers.

E.g. 3 + ▢ =10

10= 3 + ▢

Year 2

Number bonds using Numicon

Children should know **all** number bonds to 20 by the end of the year.

19 + 1 =   18 + 2 =

Addition as commutative

Children need to understand that addition is commutative (i.e. sums can be done in either order.)

4+6   5+5   6+4

Number lines

Children are strongly encouraged to continue to use number lines.

3 + 1 = **4**

0 1 2 3 4 5 6 7 8 9 10

Hundred square

Children are shown how to use a hundred square to add ten.

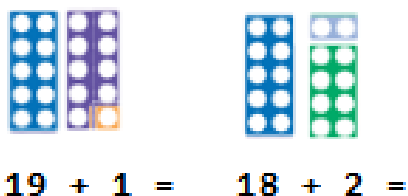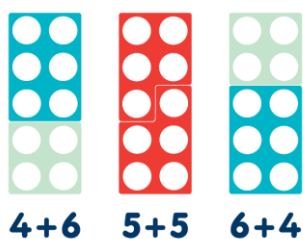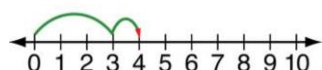| 1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Partitioning using Place value cards

Children need to know how to add units, tens and hundreds mentally. Place value cards are used to show the value of the different digits in a number.
E.g.

145 = 100+40+5

Adding Numbers using partitioning

Children learn how to add two 2 digit numbers mentally by partitioning the numbers.

Use of place value cards for addition.

Column Addition

In preparation for Year 3 diennes apparatus are introduced to add two 2 digit numbers using column addition.

Tens	Units

22 +

33

_____
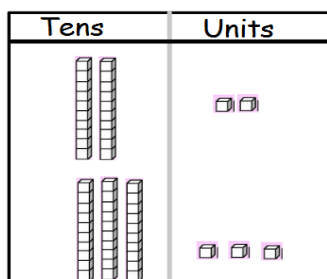
When the concept is understood, the teacher will move on to numbers where exchanging 10 units for a ten is necessary.

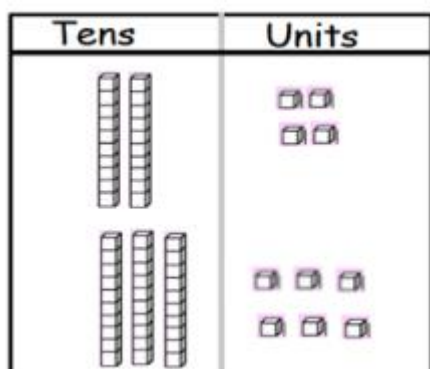| Tens	Units

24 +

36

60

1

Children will solve everyday problems linked to addition using these strategies.

Inverse

Children are taught how to recognise and use the inverse relationship between addition and subtraction (e.g. 2 + 7 = 9 so 9 – 7 =2) and use this to check calculations and solve missing number problems.
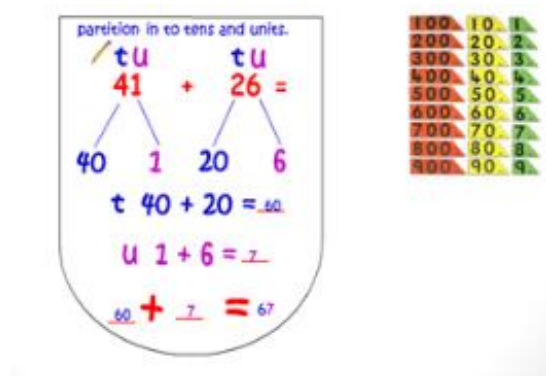
Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using 3 + 7 = 10; 10 – 7 = 3 and 7 = 10 – 3 to calculate 30 + 70 = 100; 100 – 70 = 30 and 70 = 100 – 30.

<u>Year 3</u>

<u>Partitioning</u>

Informal written examples are still used to add two 2 digit numbers.

Where appropriate, place value cards are used in addition.

By the end of Year 3 all children should be able to add numbers mentally using partitioning, including:

3 digit and 1 digit number.   E.g. 321 + 9 =
3 digit and 2 digit number.   E.g. 321 + 19 =
3 digit and 3 digit number.   E.g. 321 + 121 =

<u>Formal column method</u>

When expanded/informal methods are secure. Formal column methods for calculations are introduced involving the adding of two 2 digit numbers initially then two 3 digit numbers.

The children will solve number problems and practical problems linked to addition.

<u>Number lines</u>
Some children in Year 3 will still benefit from using number lines and other apparatus to give them visual prompts.

<u>**Year 4**</u>

<u>**Formal column method**</u>

Children add 3 and 4 digit numbers using column addition.

```
    7  8  9
 +  6  4  2
 _____
 1  4  3  1
    1  1
```

They also add £ and p

£3.45 +
£3.56
£7.01
 1 1

Children solve addition two-step problems in contexts, deciding which method to use and explaining why.

<u>**Estimation and Use of inverse operation**</u>

Children are shown how to estimate and use inverse operations to check answers to a calculation.

E.g.

£3.45 +
£3.56
£7.01
 1 1

Using inverse- £7.01 - £3.56 =£3.45

Using estimation- £3.00 + £4.00 = £7.00

Year 5

Formal column method

Children add 4 and 5 digit numbers in column addition.

$$3456$$
$$2456 \quad +$$
$$5912$$
$$1\ 1$$

They add decimals with one or two decimal places.

Line up the decimal points	Line up the decimal points
22.3	1.234
$+\ 34.1$	$+\ 4.1$
56.4	5.334

Solve multi-stepped number problems and practical problems involving addition (including use of decimals.)

Estimate and use inverse operations to check answers to a calculation.

Year 6

Consolidate written and mental methods.

Solve multi-stepped number problems.

Add a combination of positive and negative numbers (e.g. -4 + 6 =2).

Estimate and use inverse operations to check answers to a calculation.