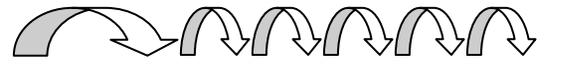
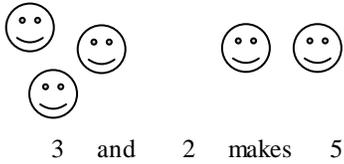




Abbots Farm Infant School Calculation Policy

Addition		
Foundation	Year 1	Year 2
<p>Children begin to add/count on mentally using rhymes and begin to record in the context of play or practical activities e.g;</p> <p>Recording with marks, stamps, objects and mathematical symbols How many ways can you put 5 apples in 2 bowls.</p> <p>Combine 2 groups of objects or Numicon to find a total.</p> <p>Use the language of 1 more by adding one to a group e.g tower of cubes</p> <p>Adding stories and role play, encouraging use of language for addition – plus, altogether, total, sum, more</p> <div style="text-align: center;">  <p>9 and 1 more is 10 9 add 1 equals 10 9 + 1 = 10</p>  </div> <p>Use a numbered large number lines (number tiles) to identify one more.</p> <p>Use of number tracks to 20 to count on.</p>	<p>Adding by counting on. First by finding 1 more then in steps of 1.</p> <p>Children can count on from the first number using fingers, objects and Numicon.</p> <div style="text-align: center;">  <p>2 + 5 = 7 2 count on 5</p> <p>5 + 2 = 7 5 count on 2</p>  </div> <p>Teacher should model drawing jumps on the numbered number line to support understanding of the mental method.</p> <p>Learn that addition can be done in any order and are taught that it is more efficient to put the larger number first.</p> <p>Children are taught to draw blank number lines as an aid to mental calculation.</p> <p>Children need to understand the concept of equality before using the = sign. Calculations should be written either side of the equality sign so that the sign is not just interpreted as the 'answer'. E.g. 2 = 1+1 and 2+3 = 4+1</p> <p>Children begin to read, write and interpret addition number sentences using + and =.</p> <p>Continue to develop the use of language associated with addition.</p> <p>Missing numbers need to be placed in all possible places within the number sentence. 4 + <input type="text"/> = 7 <input type="text"/> + 2 = 8</p> <p>Also cover up operations as well as numbers.</p> <p>Solve one step problems involving addition using concrete objects and pictorial representations.</p>	<p>Children add up to 3 single digit numbers. Children learn to add a 1 digit number to a 2 digit number Then a multiple of 10 to a 2d number. Then adding 2d + 2d</p> <p>Use of practical apparatus such as dienes is used to aid mental calculation when adding 2 digit numbers.</p> <p>Children learn to count on in tens and ones on the number line.</p> <p>Children add 2 digit numbers on the hundred square by counting on in tens down the hundred square and then across in ones.</p> <p>Add 9 and 11 by adding 10 and adjusting by 1.</p> <p>They draw blank number lines and draw how many they are counting on in jumps of tens and ones. 23+15</p> <div style="text-align: center;">  <p>23 33 34 35 36 37 38</p> </div> <p>Derive and use related number facts up to 100.</p> <p>Continue with using a range of equations as in year 1, but with larger numbers such as multiples of 10.</p> <p>70 + <input type="text"/> = 20 + <input type="text"/></p> <p>Solve problems using concrete objects and pictorial representation in practical contexts involving numbers, quantities and measures. Applying their increasing knowledge of mental and written calculations.</p>

Children combine 2 groups of objects. Through cutting and sticking and picture representation of an addition sentence



Children learn number bonds to 10 through practical exploration.



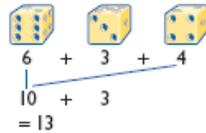
$$3 + \square = 5$$

Use addition in terms of 'how many more' to calculate the difference. Use of money to count on to give change.

Children learn number bonds to 20 through 'fact families'.

- Eg;
 $2+8=10$
 $8+2=10$
 $10-2=8$
 $10-8=2$

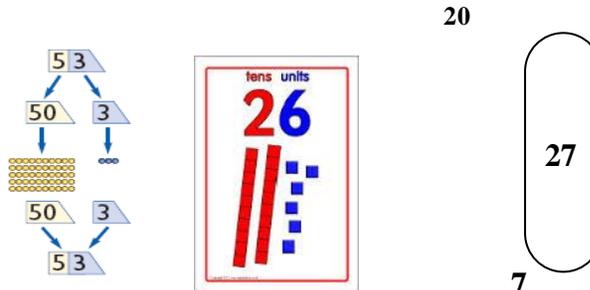
Children begin to add 3 single digit numbers, by looking for pairs of numbers or doubles to aid mental calculation.



Children are taught to use the hundred square to find 10 more by looking at the number underneath..

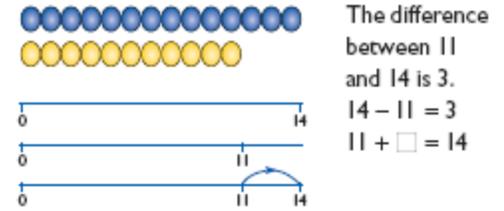
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Children begin to learn place value of 2 digit numbers to add in tens and ones.

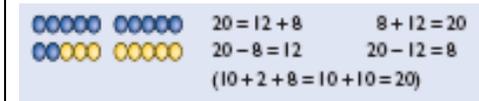


Pupils realise the effect of 'adding zero'

Find the difference by counting on with larger numbers on the number line.



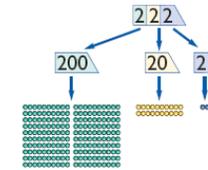
Know that subtraction is the inverse of addition and use known number facts to calculate mentally.



Begin to add by bridging through 10 where necessary.

Children begin to round up to the nearest multiple of ten.

Children begin to add larger 3 digit numbers by partitioning and re-combining into hundreds, tens and ones.



$$\begin{aligned} 112 + 27 &= 100 + 10 + 20 = 130 \\ &= 2 + 7 = 9 \\ &= 139 \end{aligned}$$

Introduce formal method of recording addition when secure with the process using place value

Eg:

$$\begin{array}{r} 42 \\ +23 \\ \hline \end{array}$$

Language of addition is constantly reinforced.

Key Vocabulary:

- more/less
- biggest/smallest
- add
- altogether
- makes
- sum
- calculation
- 1 more
- how many

- more/less
- biggest/smallest
- add
- altogether
- makes
- sum
- calculation
- 1 more
- how many
- total
- score
- addition
- double
- ten
- distance between
- tens and ones (units)

- more/less
- biggest/smallest
- add
- altogether
- makes
- sum
- calculation
- 1 more
- how many
- total
- score
- addition
- double
- tens
- units
- ones
- distance between
- 100
- 2 more
- 10 more

Subtraction

Foundation

Begin to record in the context of play or practical activities e.g.; counting rhymes that count back.

Remove objects from a group

'I have 5 apples and a take one away how many are left?'

Use the language of 1 less by taking 1 from a group e.g. tower of cubes

Use of number line to 20 to begin to mentally find 1 less.

In take away stories such as role play encouraging use of language of subtraction – minus, subtract, take away, less



1 less than 10 is 9
10 subtract 1 equals 9
 $10 - 1 = 9$



Picture representation of an subtraction sentence



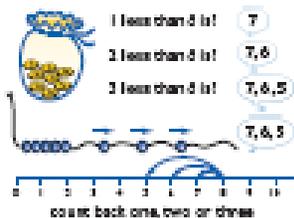
5 take away 1 leaves 4

Record practical subtraction in a way that allows each child to explain to others through marks, stamps, objects and mathematical symbols.

Year 1

Use of practical apparatus is still used to demonstrate subtraction as taking away.

Children can count back from the first number using fingers, objects, Numicon etc.



First subtract by finding 1 less then in steps of 1.

Children learn to count back in ones on a number line to 20

Teacher should model drawing jumps on the numbered number line to support understanding of the mental method.

Children use numbered lines progressing to drawing blank number lines.

Learn that subtraction must start with the larger number and count back the smaller number.

Children begin to record subtraction number sentences using - and =.

Missing numbers need to be placed in all possible places within the number sentence.



Also coverup operations as well as numbers.

Children should be taught to find the difference using subtraction.

Year 2

Children subtract single digit numbers,

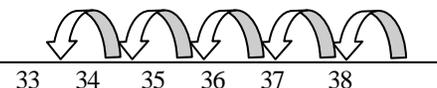
Children learn to count back in tens and ones on the number line.

Subtract 9 and 11 by subtracting 10 and adjusting by 1 using the hundred square.

Children subtract 2 digit numbers on the hundred square by counting back in tens up the hundred square and then back in ones.

They then draw blank number lines and draw how many they are counting back.

$38 - 5$



This would then progress to jumping in tens then ones.

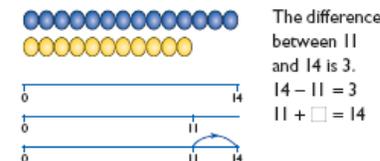
Subtract by bridging through 10 where necessary.

Continue with using a range of equations as in year 1, but with larger numbers such as multiples of 10.

$$100 - \square = 40$$

Derive and use related number facts up to 100.

Find the difference by counting on with larger numbers on the number line.



Know that subtraction is the inverse of addition and use known number facts to calculate mentally.



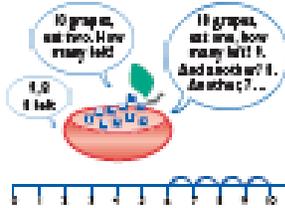
The difference is:

$$8 - 5 = 3$$

Children are taught to use the hundred square to find 10 less by looking at the number above.

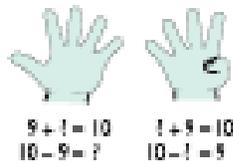
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Children begin to subtract to solve simple one step word problems.



Solve one step problems involving addition using concrete objects and pictorial representations.

Begin to recognise that subtraction is the inverse of addition.



		$20 = 12 + 8$	$8 + 12 = 20$
		$20 - 8 = 12$	$20 - 12 = 8$
$(10 + 2 + 8 = 10 + 10 = 20)$			

Children begin to subtract larger 2 digit numbers by partitioning the second number only.

$$\begin{aligned} 37 - 12 &= 37 - 10 = 27 \\ &= 27 - 2 \\ &= 25 \end{aligned}$$

Subtract by bridging through 10 where necessary.

Children learn formal written method of subtraction when ready eg;

$$\begin{array}{r} 52 \\ - 21 \\ \hline \end{array}$$

Key Vocabulary:

- subtract
- take away
- less than
- equals
- bigger
- smaller

- subtract
- take away
- less than
- equals
- bigger
- smaller
- tens
- units
- ones
- partition
- calculation

- Subtract
- take away
- less than
- equals
- bigger
- smaller
- remove
- tens
- ones
- units
- exchange
- partition
- calculation

Multiplication

Foundation

Children begin to count in groups of 2, 5 and 10 using objects, recite counting, Numicon songs and rhymes.

They count related groups of the same size in games and practical activities.



Links are also made to problem solving activities.

Children learn doubles to 10 in practical contexts.

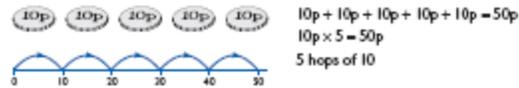
Year 1

Children group objects and Numicon in 2, 5 and 10.

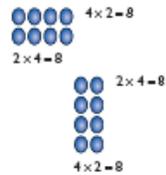
Children use visual images as repeated addition.

$$2 + 2 + 2 + 2 + 2 = 10$$

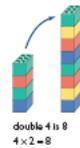
Model this as jumps on a number line.



Begin to show visual representation of this using an array.



Practically double numbers to 10 and link this with multiplying by 2.



Solve one step problems using concrete objects and pictorial representations.

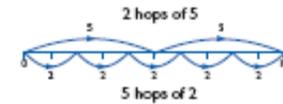
Year 2

Children use repeated addition number sentences or arrays to calculate multiplication;

$$4 \times 3 = 3 + 3 + 3 + 3$$

Explore the fact that multiplication, like addition, can be done in any order.

Children are taught to calculate multiplication questions by jumping in groups on a number line.



Children begin to record multiplication number sentences using x and =.

Understand that multiplication can be done in any order.

Recall multiplication facts of 2, 3, 5 and 10.

Use of multiplication grids to aid mental re-call

X	2	3	10
5			
3			

They are then taught to develop an understanding of the families of numbers to work out the missing numbers e.g.

$$\square \times \bigcirc = 15 \quad 4 \times \square$$

Use multiplication to solve more complex problems in a range of contexts.

Key Vocabulary:

- equal sets or groups
- counting
- how many groups of the same number
- counting in twos
- pairs of

- Array
- groups of
- count on
- count in twos, fives and tens
- lots of

- Lots of
- groups of
- multiply
- x
- multiply by
- multiple of
- once, twice , three times etc.
- repeated addition
- array
- row
- column
- double
- group in pairs, threes, tens etc.

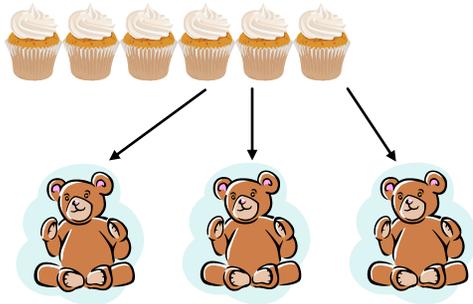
Division

Foundation

Practical division as sharing e.g. buttons, beads etc

Children share objects practically into equal groups e.g: “Share the cakes between the three bears. How many cakes will they each have?”

Links are made to problem solving activities.



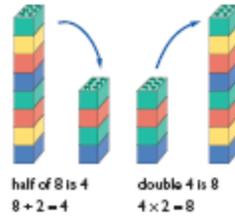
Year 1

Sort a set of objects by sharing and grouping equally into 2's, 3's, 4's etc.

Understand halving by splitting an even number into two groups (no notation)

Understand that halving is the same as dividing by two and $\frac{1}{2}$

Recognise that halving is the opposite of doubling



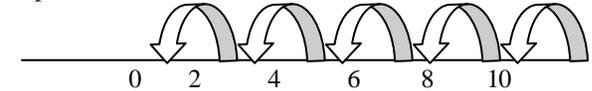
Begin to solve one step problems using practical apparatus and visual representations in a range of contexts.

Year 2

Children begin to relate division to fractions of numbers and shapes – e.g. $\frac{1}{2}$ and $\frac{1}{4}$ is the same as dividing by 2 and dividing by 4 respectively.

Children continue to use grouping and sharing of objects practically and relate to real life situations. Progressing to grouping numbers into equal sets with a remainder.

Then begin to divide a number by counting back in equal steps model this on a number line.



Understand that division is not commutative (can't be done in any order).

Children begin to record their practical division as a written calculation using \div and $=$ in a number sentence.

Children learn that division is the inverse of multiplication.

They are then taught to use the multiplication and division facts to work out missing numbers.

e.g.;

$$12 \div \square = 4$$

Children use division to solve more complex word problems.

Children are taught that dividing by 4 is the same as $\frac{1}{4}$.

Key Vocabulary:

- Sharing
- Grouping

- Sharing
- Grouping
- Arrays

- Sharing
- Grouping
- Division
- Remainders
- Arrays

