Brewster Avenue Infant School

Calculation Policy

January 2021

EYFS

Key experiences before Year 1

- Know the rules of counting i.e. we say the numbers in order, one number name per item and that the last number reached tells you how many in total (cardinal principle).
- Begin to develop a sense of the number system by verbally counting forward to and beyond 20, pausing at each multiple of 10.
- Play games that involve moving along a numbered track, and understand that larger numbers are further along the track.
- Begin to experience partitioning and combining numbers within 10.
- Distribute items fairly, for example, put 3 marbles in each bag. Recognise when items are distributed unfairly.
- Understand the cardinal value of number words, for example understanding that 'four' relates to 4 objects.
- Subitise for up to 5 items.
- Automatically show a given number using fingers.
- Devise and record number stories, using pictures, numbers and symbols (such as arrows).
- Extend and create ABAB patterns.

Reception Term 1

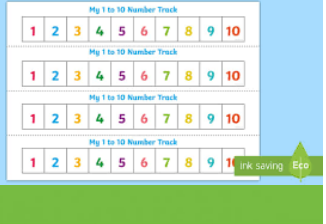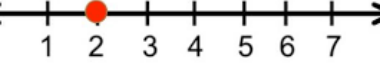|	
Matching and sorting	Matching socks, Numicon base boards. Sort a range of objects based on different properties e.g. buttons
Comparing amounts	Compare sets of items. Which has most/fewest?
Representing 1,2 and 3	Count 1,2,3 objects, dots, jumps, claps, fingers.
Comparing 1,2 and 3	Compare sets of 1,2 and 3 items. Compare and order patterns of dots.
Composition of 1,2 and 3	Use Numicon to make 2 and 3. Arrangements of dots on dominoes/ladybirds. Double-sided counters. Stories such as Three Billy Goats Gruff.

Representing numbers to 5 1 more and 1 less	
Reception Term 2 and beyond	
Introduce zero	Number songs e.g. Five Little Monkeys. How many are left at the end? Contrast familiar numbers with zero.
Compare numbers to 5	Compare quantities using objects and representations.
Composition of 4 and 5	Explore the different ways of making 4 and 5. Notice that numbers can be made from two parts or more than two parts
6,7 and 8	Arrange 6,7 and 8 in to smaller groups so that children can see how numbers are made of smaller numbers e.g. 4 and 4 to make 8.
Making pairs	Arrange quantities in to pairs. Begin to see that there will be one item without a partner with odd numbers.
Combining two groups	Count in ones to find how many altogether.
9 and 10	Represent nine and ten in different ways. Subitise ten by seeing that a full tens frame has ten items.
Comparing numbers to 10	Compare sets of items and compare their position in the counting order. Begin to order three or more quantities.
Bonds to ten	

	Explore bonds to ten using real objects.

Progression in Number and Place Value

Objective	Concrete	Pictorial	Abstract
count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number		 Number Lines Marked and unmarked number lines.	0,1,2,3..... 10,9,8,7,6... 6,7,8,9,10,11,12..... 34,35,36,37..... 99,98,97,96..... Counting with number names **and** number structures e.g. 7,8,9,10, one ten, one ten one, one ten two, one ten three…

		Gattegno Chart | 1000	2000	3000	4000	5000	6000	7000	8000	9000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9	 Gattegno Chart	
count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s		**Skip Counting by 10s** 20 25 30 10 20 30 40 50 Counting in 2s number line 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40	2,4,6,8… 0,5,10,15… 20,30,40, 50… 35,25,15… Count in odds and evens forwards and backwards
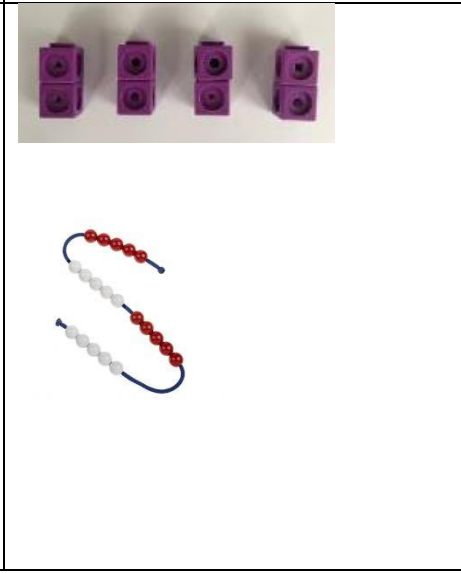
given a number, identify 1 more and 1 less			What is 1 more than 7?
count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward	 Numicon	Number tracks, number lines 	0,3,6,9 12,15,18 20,17,14,11

| recognise the place value of each digit in a two-digit number (10s, 1s) | |
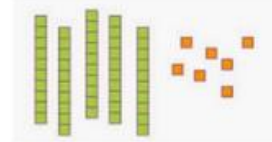
Put all the tens and ones on the place value grid to make two numbers.

Tens	Ones

Tens	Ones
			Hundreds Tens Ones

3 6 9
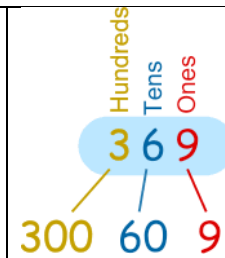
300 60 9 |
| compare and order numbers from 0 up to 100; use <, > and = signs |

Teaching Place Value outside!

Less than more than
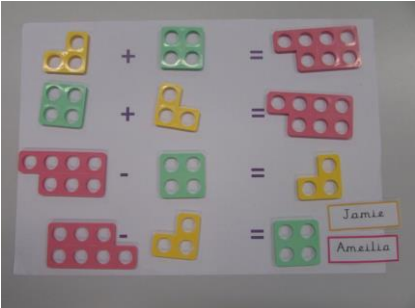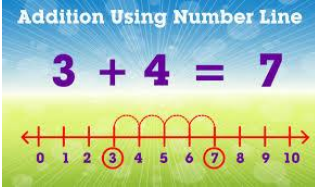
Click to read the blog post | | 4>3

22<23

10=10 |

		Marked and unmarked number lines. Children should be able to reason about the position of numbers on the number line e.g. '16 is about here as it is just over half way between 10 and 20.'	

Progression in Addition and Subtraction

Objectives	Concrete	Pictorial	Abstract
read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs	Children should use mathematical language relating to addition and subtraction during practical activities before being introduced to the signs. Children also need to understand that equals means balance. Numicon scales should be used to reinforce this.	4+3 8+5 9-2 13-7 **Addition Using Number Line** 3 + 4 = 7 0 1 2 3 4 5 6 7 8 9 10	4+3=

| **represent** and **use** number bonds and related subtraction facts within 20 | |
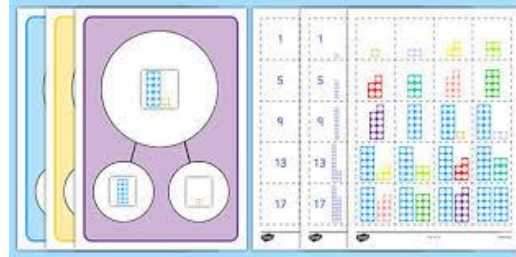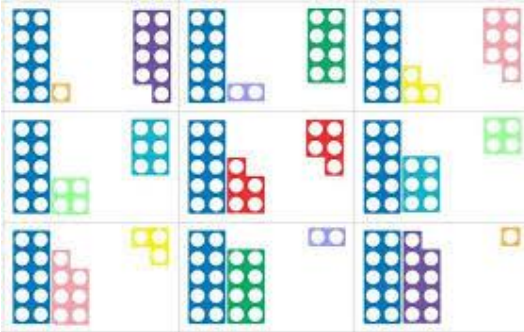
Pictorial part whole models

Part whole models alongside quantity images to support development of the understanding of quantity. | Work methodically to represent all number bonds.
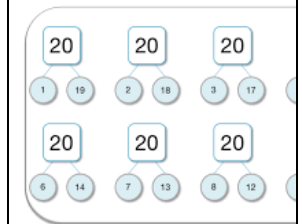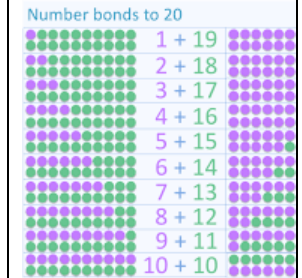
 |
| add one-digit and two-digit numbers to 10, including zero | |

7

| 4 | 3 | | 4+3=7 |

To 20			8+7=15
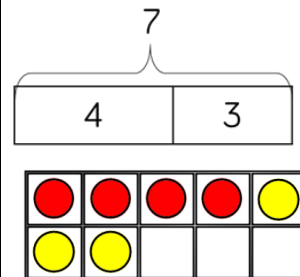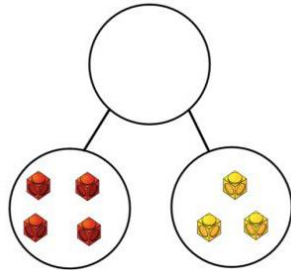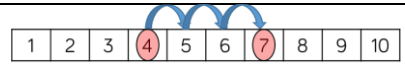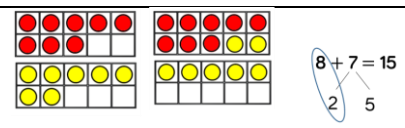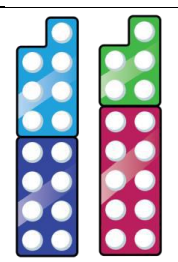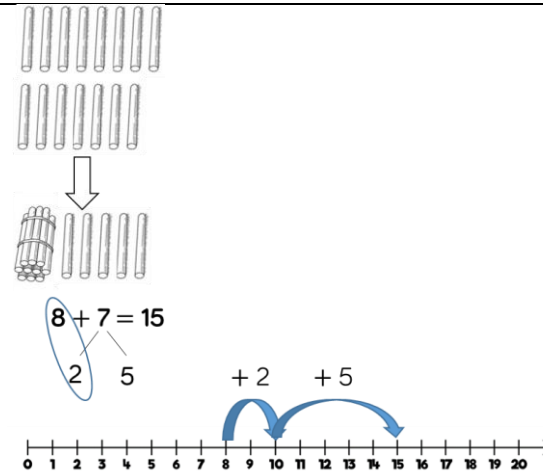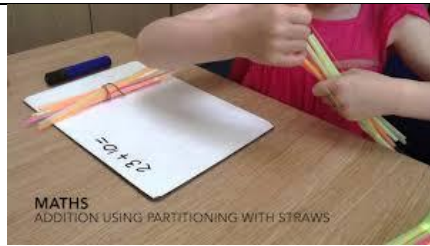
	MATHS ADDITION USING PARTITIONING WITH STRAWS		$8 + 7 = 15$ $2 \quad 5 \qquad +2 \quad +5$	
solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9	Part-Whole Model $3 + 5 = □ + 4$	Find the missing part.	Find the mising part. **Whole Unknown** Kevin has 5 sheep and 4 cows. How many animals does he have on his farm altogether? **Part Unknown** Sophie has 13 blue and orange smarties, 7 are orange. How many blue smarties does she have?	7 = □ – 9
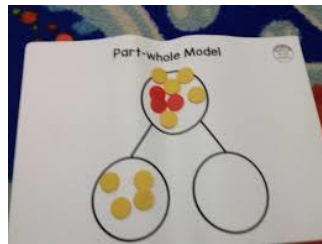
| Subtract 1-digit numbers within 10 | Using cubes to find the difference

 Partition

 Partition/Reduction

 First   Then   Now | Partition/Reduction

 7
 4   3
 7
 ?   3

 Reduction

 1 2 3 4 5 6 7 8 9 10
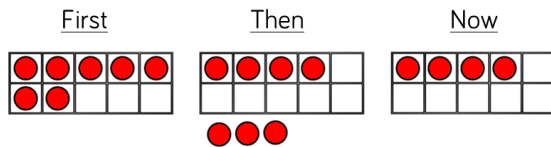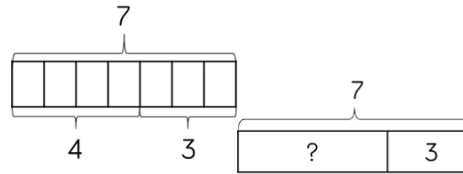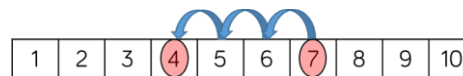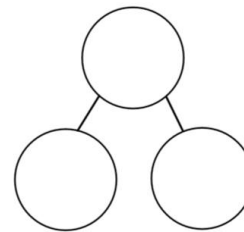
 Partition | 7-3=4 |
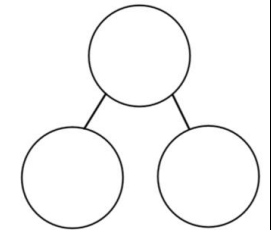
Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100.				
Add and subtract numbers using concrete objects, pictorial presentations and mentally including: 2 digit number and ones 2 digit number and tens	When subtracting, find the number bond to 10 and then partition subtracted number. e.g. 14-6 **Numicon** Make number bond to ten first then encourage children to partition 6. Suctract 4 and then 2. **Straws** Group tens. To subtract 6 they have to subtract 4 and then 2 from the group of 10.			38+5=43
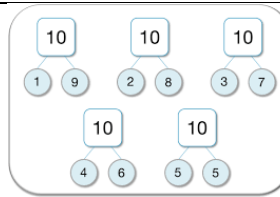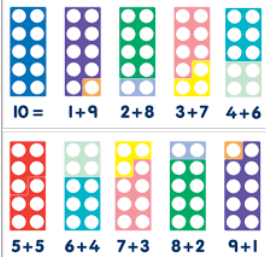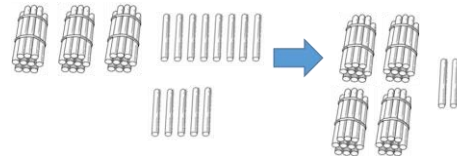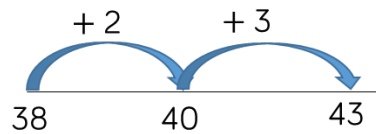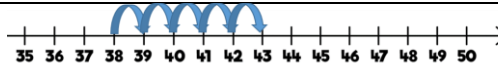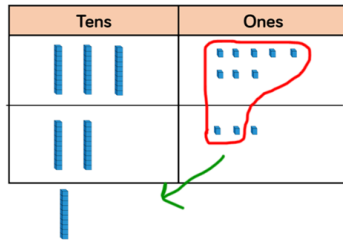
Two 2 digit numbers	Tens / Ones table with 38 + 23 = 61	Use straws and hundred squares to help children find the number bond to ten.	38+23=61
Subtract 1 and 2-digit numbers to 100		Tens / Ones table Blank number lines...	65-28=37
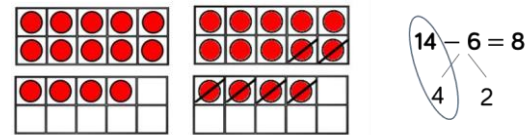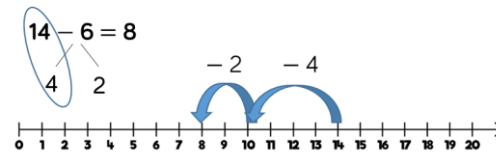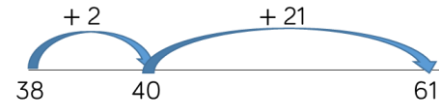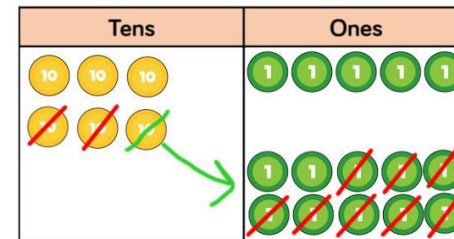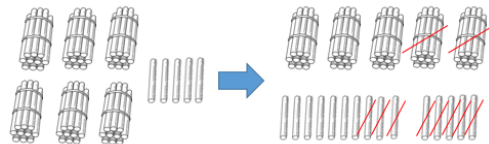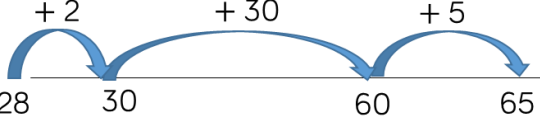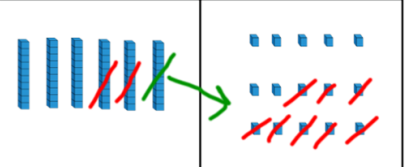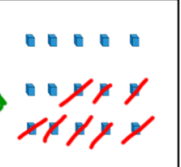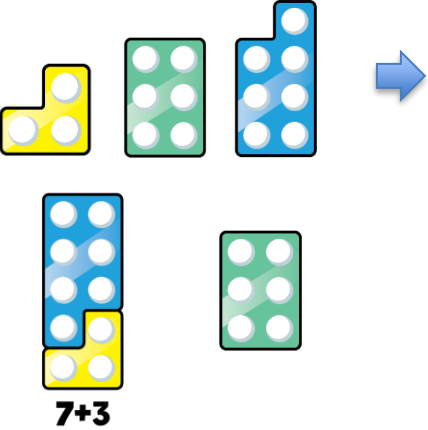
	Tens	Ones			

Jump in tens to become more efficient.

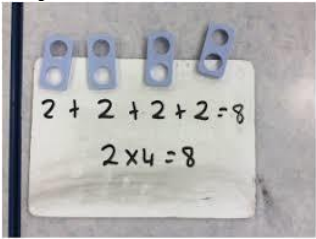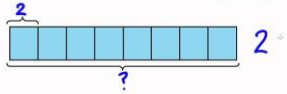| Add three 1 digit numbers	7+3	Part whole model	7+6+3=16 Part whole model

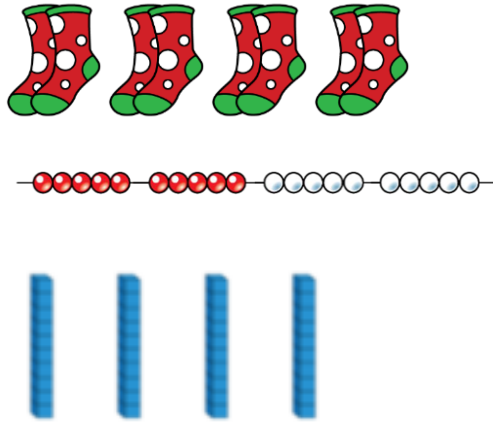| Solve problems with addition and subtraction: · using concrete objects and pictorial representations, including those involving numbers, quantities and measures · applying their increasing knowledge of mental and written methods	• Use Base 10 to help you find the missing number. • David has 6 cubes. George has 3 more cubes than David. How many cubes do they have altogether? Use the ten frames to help you find your answer.
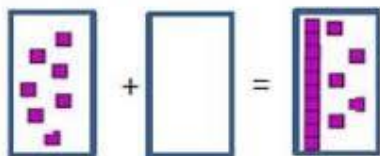
Progression in Multiplication and Division

Objectives			
solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	Repeated addition with Numicon $2 + 2 + 2 + 2 = 8$ $2 \times 4 = 8$ Arrays with objects	A milk carton contains 2 l of milk. The cartons are packed into boxes. Each box can hold 8 cartons. What is the volume of milk in 1 box? 2 matholia Scaling problems e.g. There are 3 girls in a group. There are five time more boys than girls. How many boys are there? Boys 3 3 3 3 3 Girls 3 Children draws their own array	$8 \times 2 = 16$

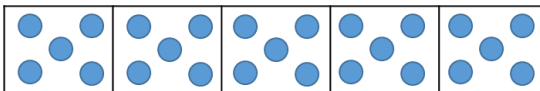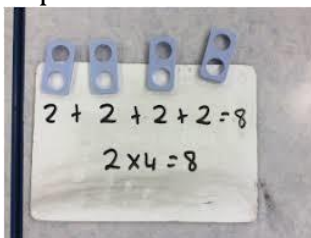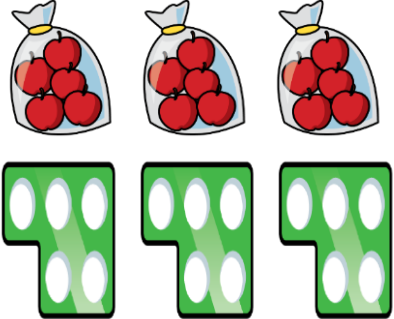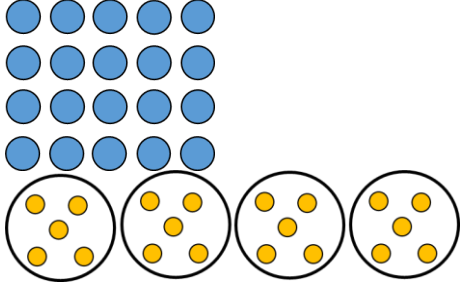|			
recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers		Highlight patterns on a hundred square	Recall multiplication facts 3x2=
calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication, division and equals (=) signs	Bar model Place cubes, counters etc in the bar before moving on to inserting digits. Repeated addition with Numicon 2 + 2 + 2 + 2 = 8 2 x 4 = 8 5x3=15	Number tracks (and labeled number lines) to count in multiples	3x6=18
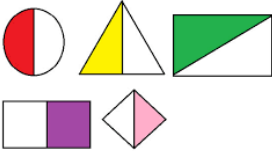
	Represent multiplication as repeated addition in many ways.		5+5+5+5=20 4x5=20

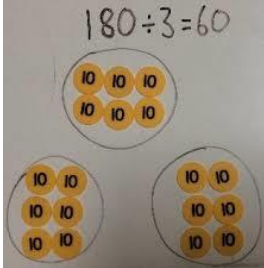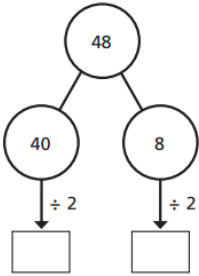|			
Solve one-step problems involving multiplication (sharing) and division (grouping)			20÷5=4
Divide 2-digits by 1-digit (sharing with no exchange)	**Straws/Base 10** Divide the tens divide the ones. Place value counters		48÷2=24

	180÷3=60	48 / 40, 8 / ÷2, ÷2	

Progression in Fractions

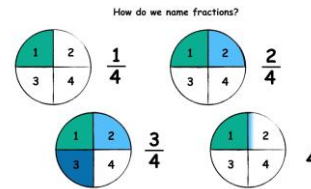| Objective	Concrete	Pictorial	Abstract
recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity		 Colour half of the shape.	Children are not required to write fractions at this stage.

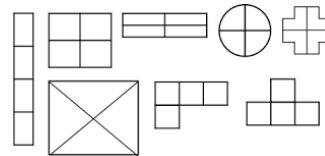|			
recognise, find, name and write fractions write simple fractions	Ensure children know the difference between equal and non-equal parts. Sharing beanbags in to a container to make two equal groups. Share the sweets between 4 people.	How do we name fractions? Matching pictures and fraction. What fraction of the shapes has been coloured? ¼ is shaded blue, what fraction is white?	½ of 6 = 3

Find fractions of given numbers with Numicon.

Find fractions using bar models and objects.

$\frac{3}{5}$ of 30 = 18

Fractions of amounts using the bar model
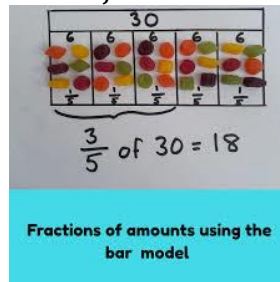
Children should be able to count in fractions from 0.