Brownsover Community School

Calculation Policy

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Approvals

Role	Name	Signature / Approval	Date
Headteacher	E. Basnett	yes	
Governors - Full Governing Body			
Governors - Performance & Standards Committee			
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Reviewers

Role	Name
Headteacher	Elisa Basnett
Governors	

Distribution for Information

Role	Name

Calculation Policy

The calculation policy has been produced to ensure consistency in teaching mathematics throughout the school. It will give an overview of the different strategies used in our school to teach the four operations in mathematics-

- Addition
- Subtraction
- Multiplication
- Division

This policy will demonstrate the key pencil and paper procedures and give examples of the concrete objects and measuring tools to support children's learning from reception to year 2

Addition

Reception

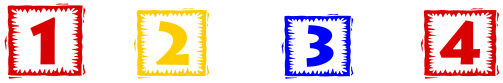
Children begin to add/count on mentally using number rhymes and begin to record in the context of play or practical activities
e.g; recording with marks, stamps or objects
How many ways can you put 5 apples in 2 bowls.

Find the total number of two groups by counting all of them.

Adding stories and role play, encouraging use of language for addition.

Use the language of 1 more by adding one to a group of objects e.g tower of cubes, counters, plates & cups, fruit in the bowl. Initially to a group of 5 then 10. Knowing 1 more than a number to 20.

Use large numbered number lines and number tiles to identify one more and one less.



In a range of contexts and games hildren combine 2 groups of objects. Through practical activities, cutting and sticking and picture representation of an addition sentence

3 and 2 makes 5

Record using marks that they can interpret and explain.

Year 1

Adding by counting on. First by finding 1 more, then in steps of 1.

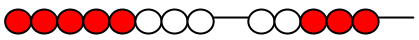
5 and 1 more is 6

Children can count on from the first number using objects practically, by adding another object to a set.

Add numbers up to 20 and beyond by using and combining objects.

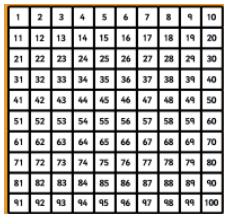
Practically combine 2 or 3 sets of objects to solve addition

Bead strings can be used to illustrate addition.



8 + 5 =

Then a number line or 100 square



Teachers demonstrate the use of the number line to add. Children then begin to use numbered lines to 30 to support them in counting on in jumps of 1 to find a total.

Learn that addition can be done in any order but to know that it is more efficient to put the larger number first.

When children are confident in adding/combining two or three sets of objects, children need to understand the concept of equality before using the = sign.

Calculations should be written either side of the equality sign

Year 2

Children will continue to use 100 squares, numbered number lines but also ten rods and ones to practically add two-digit numbers.

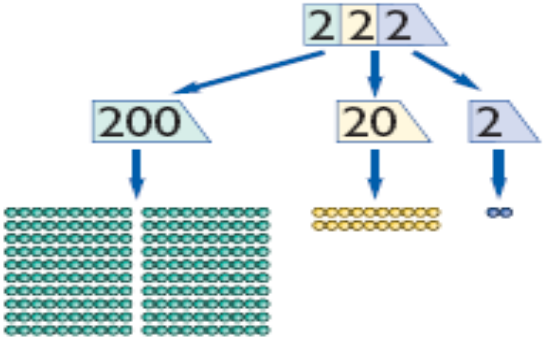
Children begin to add two digit numbers to two-digit numbers. Wtiiten methods to be introduced.

12+27 = 10 + 20 = 30
= 2 + 7 = 9
= 30 + 9 = 39

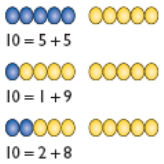
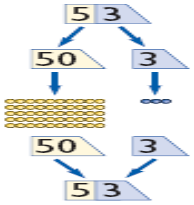
Continue with using a range of equations as in year 1, but with larger numbers such as multiples of 10.

70 + ☐ **20 +** ☐

Then larger 3 digit numbers by partitioning and re-combining into hundreds, tens and ones.



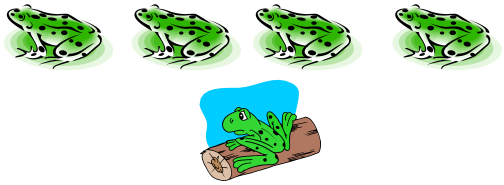
Children know and use addition and subtraction facts to 20

Children are encouraged to write numbers in a variety of contexts. e.g. Shopping lists, hopscotch, writing numbers in the sand, and birthday number hunts. **Early Learning Goal** **Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single digit numbers and count on and back to find the answer. They solve problems, including doubling, halving and sharing**	so that the sign is not just interpreted as the 'answer'. E.g. 2 =1+1 and 2+3 = 4+1 Children should record addition number sentences using + and =. Children can say the number that is 1 more than any given number (0-30) Children are taught to say the number that is 10 more than any give number , using 10 rods and ones. Children learn and know number bonds to10 by heart.  Children begin to learn place value of 2 digit numbers to add in tens and ones.  Children add a singe digit number to a teen number, then a higher two digit number. Use a '10 stick' and cubes to support. Use addition to solve simple addition problems. Children should use number lines or 100 squares to help solve missing number problems. 6 + ☐ = 10 2 + ☐ = 10 	fluently. e.g. 7 +13 = 20 5 + 15 = 20 20 – 13 = 7 20 - 15 = 5 Children use addition to solve 1 step word problems. e.g. There are 12 apples in my basket I add 3 pears. How much fruit is in my basket now?

Subtraction

Reception

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



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, plates from the table etc

Children practically find 1 less than a group of up to 5 objects and then 10

They then practically find 1 less than a number 1 to 10

Children experience subtraction in take away stories such as role play encouraging use of language of subtraction.

Use a numbered, large number line or floor tiles to identify one less.

Record using marks they can interpret.

Picture representation of a subtraction sentence

5 take away 1 leaves 4

Year 1

Counting back in steps of 1 then 10.

Children can count back 1 from the first number practically, using objects by removing one object from a set.

Say the number that is 1 less than any given number (0-30)

Children to subtract practically using cubes/counters by removing objects from a set.

Then model drawing jumps on the numbered number line to count back in ones.

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

Children record subtraction number sentences using - and =.

Children are taught to use 10 sticks and ones to find 10 less by removing the ten stick.

Children begin to subtract to solve simple word problems.

e.g.
I have 10 sweets I give 2 to my friend how many do I have left?

Year 2

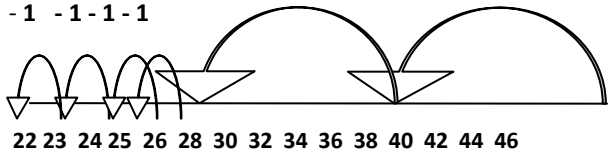
Children will continue to use cubes and numbered numberlines.

Then begin to use empty number lines to support calculations.

Counting back:

First counting back in tens and ones.

46- 24 =22 - 10 - 10



Children subtract single digit numbers from a 2-digit number.

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

100 - ☐ = 40

Children will learn that subtraction is the inverse of addition and state the subtraction corresponding to the addition and vice versa.

7+3 = 10 10 – 7 = 3
3+7 = 10 10 – 3 = 7

Children use subtraction to solve 1 step, then 2 step number problems

Multiplication

Reception

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

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

Links are also made to problem solving activities.

Early Learning Goal
Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single digit numbers and count on and back to find the answer. They solve problems, including doubling, halving and sharing

Year 1

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

2, 4, 6, 8, …
5, 10, 15, 20…
10, 20, 30, 40…

Children start to use visual images as repeated addition.

2 + 2 + 2 + 2 + 2 = 10

Practically double numbers to 10.

Solve practical problems involving multiplication such as;

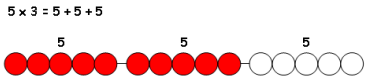
There are 4 bikes. Each bike has 2 wheels, how many wheels is that?

Solve practically, or by drawing pictures, or repeated addition

Year 2

Children use repeated addition number sentences to calculate multiplication. They practically group counters to calculate.

4x3 = 3+3+3+3



4x10p = 40p

10p +10p +10p +10p = 40p

Begin to show visual representation of this using an array.

3x2=6
2x3=6

Explore the fact that multiplication, like addition, can be done in any order.
3x 2 = 6 2x 3 = 6 7 x 5 =35 5x 7 = 35

Children record multiplication number sentences using x and =.

Use multiplication to solve more complex word problems.

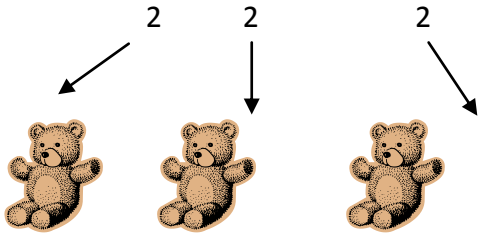
If there are 6 eggs in one box how many will there be in three boxes?

Children will be taught from heart multiplication facts for the 2,3, 5 and 10 times tables

Division

Reception

Practical division as grouping e.g. buttons, beads etc
Children share objects practically into equal groups e.g;
"Share the sweets between the three bears. How many sweets will they each have?"
Links are made to problem solving activities.

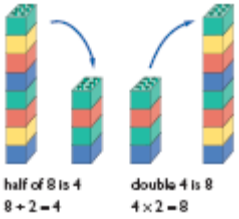


Early Learning Goal
Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single digit numbers and count on and back to find the answer. They solve problems, including doubling, halving and sharing

Year 1

Children will understand equal groups and share items out in play and problem solving. They will count in 2s and 10s and later in 5s

Halving to match doubling and understand it is the opposite.



Sort a set of objects by grouping equally.

Begin to use practical grouping to solve word problems. e.g.

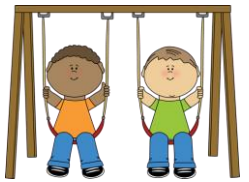
"There are 12 daffodil bulbs. Plant 3 in each pot. How many pots are there?"

Year 2

Children will develop their understanding of division practically and use jottings to support calculation

Sharing equally

6 sweets shared between 2 people, how many do they each get?



Grouping

There are 6 sweets, how many people can have 2 sweets each?

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

Children record their practical division as a written calculation using ÷ and = in a number sentence.

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

12 ÷ ☐ 4

Children use division to solve more complex word problems
Children will know and use halving as the inverse of doubling.
Children begin to relate division to fractions of numbers and shapes – e.g. ½ and ¼ is the same as dividing by 2 and dividing by 4 respectively.
½ of 6 = 3 6 ÷ 2 = 3

Recognise that finding a half involves sharing into two equal parts. Then a quarter sharing into four equal parts. Understand that one quarter and three quarters are complementary and that three quarters is made up of three one-quarter parts Begin to associate 'I have spent a quarter of 12 p with the calculation 12 ÷ 4 .—

Counting

Reception	Year 1	Year 2
Say numbers to 20, forwards and backwards in ones Read numbers to 20 Order numbers up to 20 Counts an irregular number of up to ten objects Estimates how many objects they can see and checks by counting them. **Early Learning Goal** **Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single digit numbers and count on and back to find the answer. They solve problems, including doubling, halving and sharing.**	Read and write numbers to 20 (then beyond when secure) Order numbers from 0 – 20 Know where numbers to 20 belong on a number line. Then position a selection of given numbers on a number line. Count on and back in ones to 20 and beyond. Count accurately at least 20 objects, sounds or actions, such as beads on a bead string, beats on a drum or paces across the floor Estimate how many objects there are in a group and check by counting ; for example, they predict which of two pots contains more pencils, then count the pencils to check Count on and back in ones from any small number Then count on and back in tens, twos and fives. Understand the structures of teen numbers Partition teen numbers (then higher) numbers with arrow cards Can exchange 14 ones with a ten rod and 4 ones. Children understand, use and compare ordinal numbers in practical situations, for example, to say which child is third in line in the dinner queue.	Read and write whole numbers with up to three digits Compare and order numbers from 0 to 100 using <, > and = signs Position two-digit numbers on a number line and round them to the nearest 10 Count forwards and backwards in ones, and tens from any 2-digit number Count in twos, fives, tens and hundreds from any small number Children will know the value of each digit in a two-digit number, recognising zero as a holder in the units place of multiples of ten. Partition using arrow cards or tens and ones count reliably up to 100 objects by forming groups of 10 to support the count Children give sensible estimates of at least 50 objects Children recognise and describe sequences including odd / even numbers Children know which numbers are odd or even Children recognise two-digit multiples of **10**, **5,3 or 2**