



Bottesford Schools Federation Infant Site Calculation Policy for Mathematics



Approved by:

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‘Mathematics is a creative and highly interconnected discipline essential to everyday life. A high –quality mathematics education provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject’ National Curriculum, 2014

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1. Introduction

This Calculation Policy has been produced in line with the 2014 National Curriculum for Mathematics to ensure consistency and progression in teaching throughout the school that is age appropriate. It aims to introduce children to the processes of calculation through concrete, pictorial and abstract activities. As children begin to understand the underlying ideas, they develop ways of recording to support their thinking and calculation methods and they learn to interpret and use the signs and symbols involved. This policy shows the natural progression that a child should make in their mathematical education. Children should not progress onto the advanced stages of formal written methods until they have secure conceptual understanding.

2. Intent

Maths is a journey and a long term goal, achieved through exploration, clarification, practice and application over time. At each stage of learning, children should be able to demonstrate a deep, conceptual understanding of the topic and be able to build on this over time.

Our overall aims for when children leave Bottesford Infants, are:

- develop a positive attitude to mathematics as a subject in which children gain success and pleasure
- have access to a high quality maths curriculum that is both challenging and enjoyable and builds on previous learning
- be provided with a variety of mathematical opportunities, which will enable them to make relevant connections
- ensuring children are confident mathematicians who are not afraid to take risks
- develop an ability to use correct mathematical language and vocabulary
- develop mathematical skills and knowledge and recall of basic number facts and the four operations
- make use of pictorial representations and notes to help record steps and part answers when using mental methods
- have a reliable method of calculation for each operation that children can apply with confidence when undertaking calculations that they cannot carry out mentally.

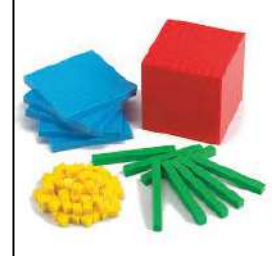
3. Implementation

This policy is a statement of the aims, principles and strategies for teaching and learning of calculation strategies in Mathematics. It is designed to help teachers and staff at Bottesford Infant School ensure that calculation is taught consistently across the school. This policy is also designed to help parents, carers and other family members support children's learning by providing an explanation of the methods used in our school.

The policy is set out in subjects, addition, subtraction, multiplication and division. Within each specific area there is a progression of skills, knowledge and layout for written methods. The calculation strategies which will be used will reflect this ideology-moving from concrete to pictorial and then abstract recording leading to more formal written methods. Through daily 'mental maths' sessions children's mental methods and strategies will work in partnership with these methods. At Bottesford Infant School it is important that staff always use correct mathematical language and encourage this from every pupil. This document identifies progression in calculation strategies rather than specifying which method should be taught in a particular year group.

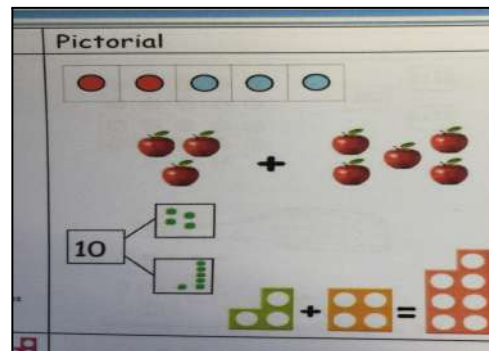
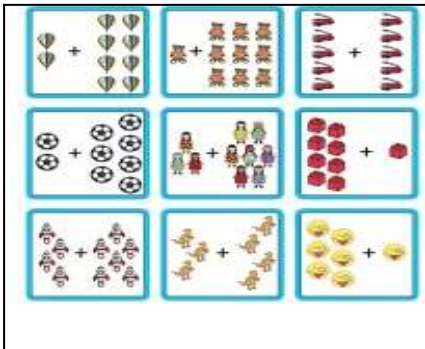
Concrete - The doing stage

There is a clear focus on the use of manipulatives and visual images to support understanding in every year group. It is important that children have access to a wide range of manipulatives in every year group and we encourage children to be independent in their use of manipulatives throughout the school and access resources as they see fit. This is the foundation for conceptual understanding.



Pictorial - The seeing stage

A child has sufficiently understood the hands-on experiences performed and can now relate them to representations, such as a diagram or a picture.



Abstract - The symbolic stage

A child is now capable of representing problems by using mathematical notation, for example $10 \times 5 = 50$

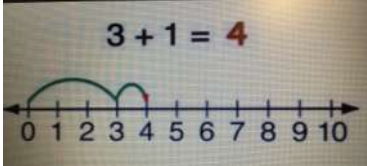
4. Impact

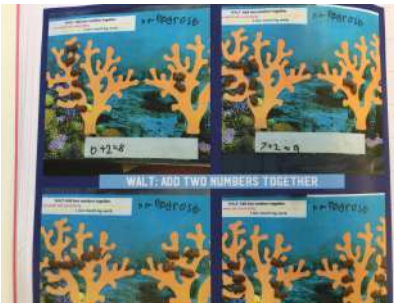
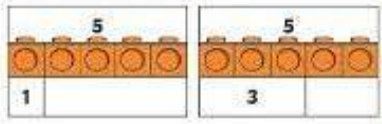
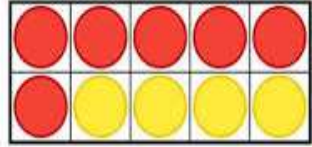
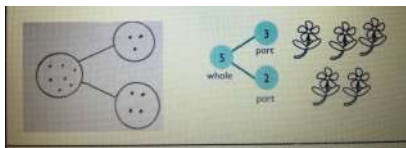
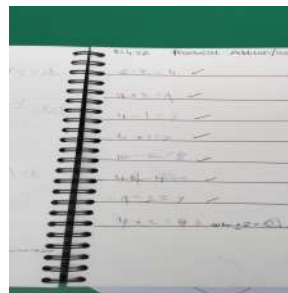
Pupils will leave Bottesford Infant School prepared for the next stage in their lives with:

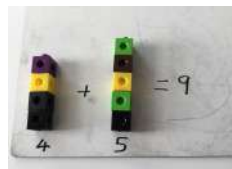
- quick recall of number facts
- the ability to recognise relationships and make connections in mathematics
- confidence and belief that they can achieve
- skills and concepts understood
- have a positive and inquisitive attitude to mathematics.

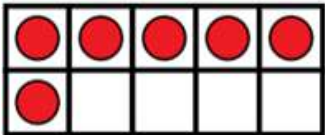
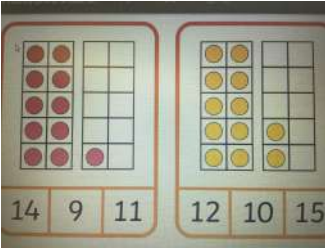
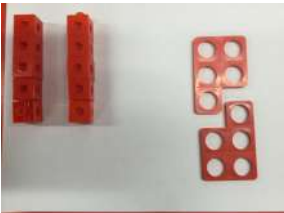
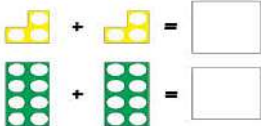
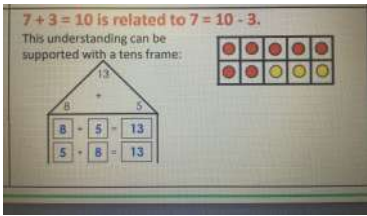
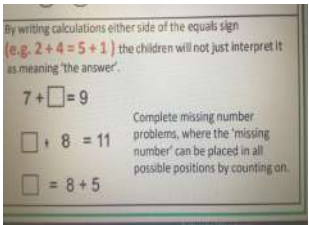
These will be assessed through: assessment, tracking, pupil progress meetings and moderation.

EYFS - Addition

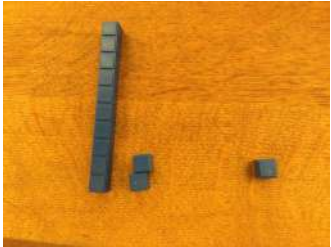
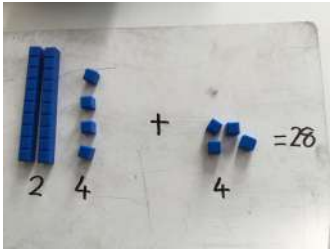
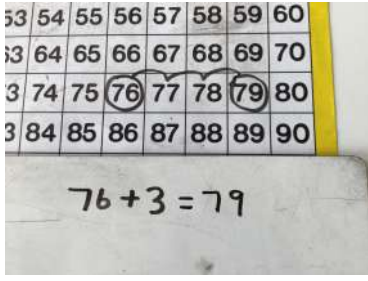
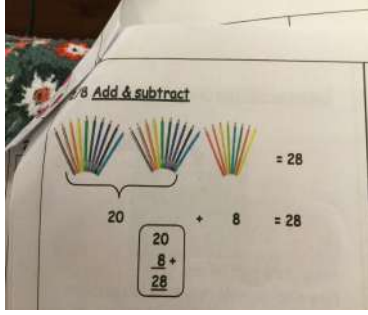
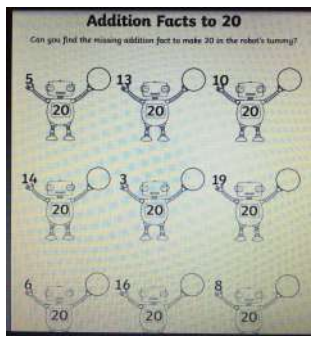
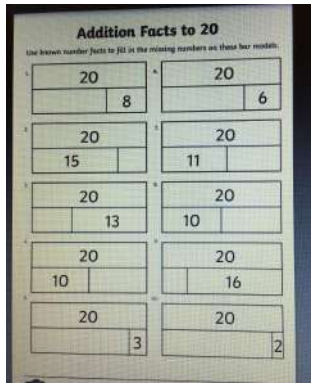
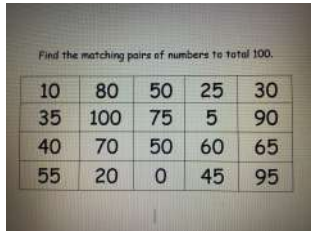
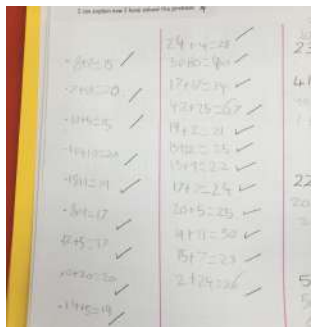
Strategies	Concrete	Pictorial	Abstract
To be able to subitise.	 Children are able to recognise quantities up to 5 without counting 'subitise'	  Children are able to subitise pictorial representations of amounts	
To link numerals and amounts.	   Children are able to match the number with the correct quantity	 Children are able to match pictorial representations of quantities with the correct number	
To be able to understand and say the number that is one more/two more than a given number	Use toys and general classroom resources for children to physically manipulate, group and regroup 1 more ...  2 more... 	Using a number line to jump on in ones, draw each jump as they add on ones 	Children start to record one more/two more 

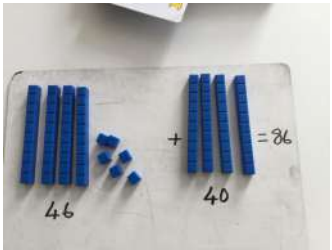
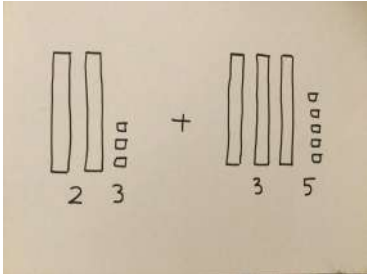
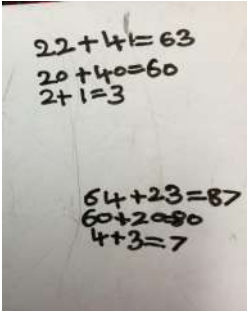
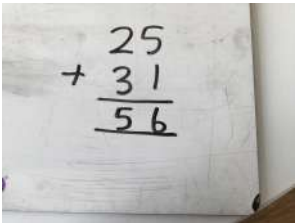
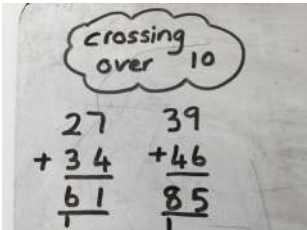
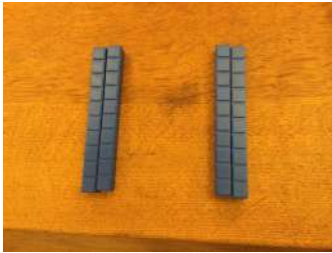
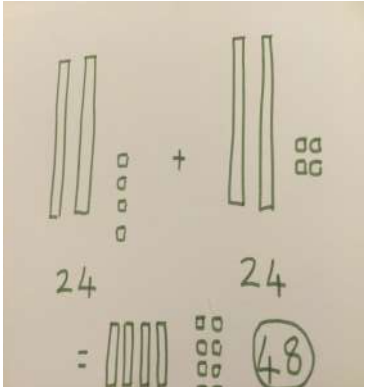
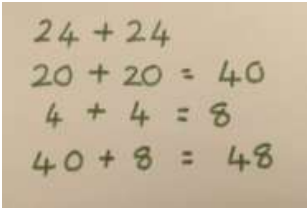
To be able to find the total of items in two groups by counting all of them Using the ten frame and Numicon to support addition of single digits Children combine Numicon to look for known shapes	Counting objects in piles and then combining them   	 Use pictures to add 2 numbers together visually as a group or visually in a bar Bar Modelling to 5 Fill in the missing numbers to make 5.  tens frames  	 Modelling number sentences next to apparatus first A focus on symbols and numbers to form a calculation 5 + 2 = 7
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Year 1 Addition			
Strategies	Concrete	Pictorial	Abstract
To know number bonds to 10 and 20	  Children should have the opportunity to use manipulatives (concrete) objects Number frames to 10 How many more do I need to make 10?	 Use number lines to add, by counting up in ones. Encourage children to start with the larger number and count on Finding different ways of recording number bonds using different visual representations	11 + 4 = 15 Children should be able to write the addition (+) and the equals (=) signs within number sentences

	 How many more to make 20? 		
To recall number doubles to 10+10	Examples:  4 + 4  5 + 5  10 + 10		1 + 1 = 2 2 + 2 = 4 up to 10 + 10 Children should be able to see the pattern in the number sentence Children should be able to write the addition (+) and the equals (=) signs within number sentences
To solve missing number problems			
Key Vocabulary - add,more,plus,and,make,altogether,total,equal to,equals,double,count on, Key skills for addition at Year 1 • Read and write numbers to 100 in numerals, including 1-20 in words • Recall bonds to 10 and 20, and addition facts within 20			

- Count to and across 100
- Count in multiples of 1, 2, 5 and 10
- Solve simple 1 step problems involving addition, using objects, number lines and pictorial representations

Strategies	Concrete	Pictorial	Abstract
To use concrete and pictorial representations to add a 2 digit number to a 1 digit number and a 2 digit number to a tens number	Add ones to a 2 digit number $12 + 1 =$   Add a 2 digit number to a tens number $23 + 20 = 43$ 	Add using pictorial representations  	    $19 + 1 = 20$  Children should be able to write the addition (+) and the equals (=) signs

			within number sentences
To add two 2 digit numbers The use of partitioning strategy in KS 1 is to develop a deep understanding of place value. In Year 2, recording addition informally in columns supports place value and prepares for formal written methods with larger numbers later on in KS 2		Using a number line or a 100 square count on... 73 + 12  Pictorial representation 	Partitioning adding the tens together then the ones, then combining them to find the total  Column method (no crossing over 10)  Column method (crossing over 10) 
To recall number doubles up to 100	20 + 20 = 40 	Pictorial representation 24 + 24 = 	
Key Vocabulary - add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, ones, partition, addition, column, method Key skills for addition at Year 2 • Add a 2 digit number and ones (eg 23 + 5) • Add a 2 digit number and tens (eg 23 + 40) • Add pairs of 2 digit numbers (eg 34 + 47)			

- Add three single digit numbers (eg $5 + 4 + 5$)
- Show that adding can be done in any order (commutative law)
- Recall bonds to 20 and bonds of tens to 100 ($30 + 70$)
- Count in steps of 2, 3, 5 and tens from any number
- Understand the place value of 2 digit numbers (tens and ones)
- Compare and order numbers using more than and less than and equal signs
- Read and write numbers to at least 100 in numerals and words
- Solve problems with addition, using concrete objects, pictorial representations, involving numbers, quantities and measures and applying mental and written methods