

Calculation Policy

Aims and rationale:

Mathematics will be at the core of children's schooling throughout their time at Hillborough Infant & Nursery School and the need for a clear, progressive policy which is understood throughout the school is vital.

Early practical, oral and mental work must be undertaken in order to lay the foundations of understanding in counting, place value and number facts as well as the four operations of addition, subtraction, division and multiplication.

Children will initially be introduced to number, counting, calculations, shape, measure and geometry through practical, oral and mental activities. Once they begin to understand these concepts they will be encouraged to informally record before finally using mathematical signs and symbols to record in a more organised/ formal way.

This policy explains the methods used to help our pupils with calculations. The methods we are advocating are in line with the new National Curriculum (September 2014). All staff in school work from this document so that we can ensure the consistency of our approach and can make sure that the children move onto the next step when they are ready whilst ensuring appropriate progression through from EYFS to the end of KS1.

Whichever of the four operations of addition, subtraction, multiplication and division is being taught children need to experience all of the following steps to completely understand it:

- 1. Concrete: use of concreted manipulatives for children to understand the concept.
- 2. Pictorial including the use of number lines and 100 squares.
- 3. Abstract including recording as digits and using mathematical symbols.



Nurse	ry	
Counting	 Say number words in sequence - recite numbers past 5 Develop fast recognition of up to 3 objects, without having to count them individually (Subitise up to 3 objects) Say one number for each item in order: 1, 2, 3, 4, 5 Know that the last number reached when counting a small set of objects tells you how many there in total ('cardinal principle') Show 'finger numbers' up to 5 Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5 	
Comparison	 Compare quantities using language: 'more than', 'fewer than' Can identify groups with the same number of things 	
Composition	 Solve real world mathematical problems with numbers up to 5 Can physically partition a number of things into two groups, and can recognise that those groups can be recombined to make the same total Can talk about different arrangements they can see within the whole 	
Written Methods	Experiment with their own symbols and marks as well as numerals.	
Re		
epresentations	<image/>	



Recep	Reception		
Counting	 Count objects, actions and sounds Knows that the quantity does not change if simply rearranged Subitise up to 5 objects Link the number symbol (numeral) with its cardinal number value Count beyond 20 		
Comparison	 Compare numbers that are far apart, near to and next to each other and next to each other. For example, 8 is a lot bigger than 2 but 3 is only a little bit bigger than 2 Understand the 'one more than/one less than' relationship between consecutive numbers. Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly. 		
Composition	 Explore the composition of numbers to 10 Knows that a number can be partitioned into more than 2 numbers Automatically recall number bonds for numbers 0-10 		
Written Methods	• Experiment with their own symbols and marks as well as numerals.		
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Year 1		
Addition		
Mental Calculations	 Read, write and interpret mathematical statements using symbols +, -, = Represent and use number bonds and related addition facts within 20 Add one digit and two-digit numbers up to 20, including zero. Solve one-step problems using concrete objects and pictorial representations, and missing number problems such as 7 = 9 Given a number, identify (and use the language) one more Begin to compare (what's the same/different?) for commutative sums e.g 3 +7 = 7 + 3 Memorise and reason with number bonds to 10 & 20 in several forms Add using objects, Numicon, cubes etc. and number lines and tracks Check with everyday objects Ensure pre-calculation steps are understood, including: Counting objects (including solving simple concrete problems Counting objects (including solving simple concrete problems Counting as reciting and as enumerating Guide a strain and as a related addition fact with served as a strain of number in solving simple concrete problems Counting as reciting and as enumerating Guide a strain and as a numerating Solve and a strain and as an unerating Guide as a strain and as a strain and as strains; bread strings; number tracks; numicon; straws; number lines (labelled) 	
Written Calculations		
Representations		



Year 1			
Subtraction			
Mental Calculations	 Subtract one digit and two-digit numbers to 20, including zero. Read, write and interpret mathematical statements using symbols (+, -, =) signs. Represent and use number bonds and related addition facts within 20 Solve one-step problems using concrete objects and pictorial representations, and missing number problems such as 7 = - 9 Memorise and reason with number bonds Subtract using objects. Numicon, cubes etc. and number lines and tracks Check with everyday objects. 		
Written Calculations	 Ensure pre-calculation steps are understood, including: Counting objects (including solving simple concrete problems Conservation of number Recognise place value in numbers beyond 20 Counting as reciting and as enumerating 		
Representations	$\begin{array}{c} \hline \\ 2 \\ \hline \\ 2 \\ \hline \\ 2 \\ \hline \\ 3 \\ \hline \\ \hline \\ 7 \\ \hline \hline \\ 7 \\ \hline \\ 7 \\ \hline \\ 7 \\ \hline \hline \hline \hline$		



Year 1		
Multi	plication	
Mental Calculations	 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. Count in multiples of twos, fives and tens with equipment, songs & rhythms, and including by rote Counting 2s e.g. counting socks, shoes, animal legs Counting in 5 s e.g. counting fingers, fingers in gloves, toes Counting in 10s e.g. counting fingers, toes Doubles up to 10 	
Written Calculations	 Recognising odd and even numbers Write as a number pattern (e.g. 5, 10, 15; 2, 4, 6; 10, 20, 30) 	
	 It is important to use a range of models to develop understanding of multiplication and that children made connections between arrays, number patterns and counting in twos, fives and tens Although there is no statutory requirement for written multiplication in Year 1, it may be helpful to encourage children to being to write it as repeated addition sentences in preparation for Year 2. E.g. 2+2+2+2=8 or 4x2=8 	
Representations	Recently referrences in o statutory requirement for written multiplication in Year 1, it may be helpful to encourage children to being to write it as repeated addition sentences in preparation for Year 2. E.g. 2+2+2+2=8 or 4x2=8	



Year 2	L		
Divisi	Division		
Mental Written Calculations Calculations	 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. (Pupils) make connections between arrays, number patterns, and counting in twos, fives and tens. Count on or back in 2s, 5s and 10s and Songs are useful look for patterns. Children should experiment with the concepts of sharing and grouping in a number of contexts. Initially they use their own recording – moving towards fluent, symbolic notation in Year 2. Conceptual understanding and recording should be continuously supported by the use of arrays as a default model, as well as other representations. 		
Representations	20 1 2 2 2 2 2 2 2 2 2 2		







Year 2	
Subtra	action
Mental Calculations	Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: > a two-digit number and ones > a two-digit number and tens > two two-digit numbers > adding three one-digit numbers Jottings to support informal methods
Written Calculations	
Representations	$ \begin{array}{c} $



Year 2			
Multip	lication		
Mental Calculations	 Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, connecting the 2, 5 and 10 multiplication tables to each other Connect the 10 multiplication table to place value Recognise odd and even numbers show that multiplication of two numbers can be done in any order (commutative) Use a variety of language to describe multiplication and division Apply doubling of numbers up to ten to doubling larger numbers 		
Written Calculations	 calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=)signs Begin to use other multiplication tables and recall facts to perform written calculations Use a range of materials and contexts including arrays and repeated addition 		
	Skill: 2 times table	Skill: 5 times table	
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resen	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	
tatic	Skill: 10 times table	Skill: Solve 1-step problems using multiplication	
Suc	• • • • • • • • • • • • • • • • • • •		
	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	One bag holds 5 apples. How many apples do 4 bags hold?	
	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 60 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 78 79 60 71 72 73 74 75 76 77 78 79 60 81 82 83 84 85 86 87 88 89 60	5+5+5+5=20 4×5=20	
	91 92 93 94 95 96 97 98 99 👀	•••• 5 × 4 = 20	



Year 2			
Multip	lication		
Mental Calculations	 Recall and use multiplication and division facts for the 2, 5, 10, 3s multiplication tables, including recognising odd and even numbers Calculate mathematical statements for multiplication and division the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs. 		
Written Calculations	 Show that multiplication of two numbers can be done another cannot Solve problems involving multiplication and division, and and multiplication and division facts, including proble Pupils decode a problem first, represent it using mani 	in any order (commutative) and division of one number by using materials, arrays, repeated addition, mental methods, ms in contexts. pulatives and jottings; and finally record it symbolically.	
	Skill: Solve 1-step problems using multiplication (sharing)	Skill: Solve 1-step problems using division (grouping)	
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entatio	Skill: Divide 2-digits by 1-digit (sharing with no exchange)		
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	$48 \div 2 = 24$		