Becoming Mathematicians - Mathematics Curriculum Map

Mathematics Curriculum Intent at Ghost Hill	*"Mathematics is about the journey, not just the destination."* **- Unknown**

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Mathematics is essential in everything we construct and everything we calculate. This is reflected through the whole school, where the use of mathematical knowledge, skills and understanding is integrated into practical activities, meaningful problems, our topics and discussions about our learning. Children develop their knowledge and understanding of mathematics as they progress through the school. Resources are available to children to help them learn, develop, and apply their understanding of the subject using the school's CPA (concrete, pictorial, abstract) approach to maths.

At Ghost Hill we aim for every child to have a love for maths that they carry with them throughout their school journey and into the wider world as part of their everyday lives. We support children in their mathematical journey using the mastery approach.
Following the Mastery Approach, we offer our children opportunities to deepen their mathematical understanding by ensuring we: -
- Involve all children in whole class participation
- Encourage good reasoning
- Empower children by giving them confidence with a positive mindset ' I can......'
- Make children aware that mistakes make us better learners
- Give children the skills to make connections in their learning and decide on the best method of working
- Give children the vocabulary to articulate their understanding with the correct vocabulary.

Through following the CPA (Concrete, Pictorial Abstract) approach we initially give children the chance to explore a new concept with concrete representations, providing them with a range of manipulatives to give hands on practical learning which they can then embed and apply into differing contexts. The children then progress to pictorial representations before finally embedding their understanding and applying it in abstract workings.

At Ghost Hill, we base our Maths learning on the White Maths Scheme of Learning. After careful consideration this scheme was chosen due to this being set up and led by mathematical specialist. The scheme also fits in well with our school expectations around CPA and mastery approaches i.e., through supporting teachers to go 'broader and deeper' within mathematical concepts, rather than using higher numbers for example. We are now adapting this to meet the needs of our school including which order units are taught within.

Composite (From National Curriculum)	Progression Components (The building blocks to National Curriculum Composites)			
By the End of KS1 (Y2)	**The Building Blocks of Knowledge in the Early Years Foundation Stage**		**Year 1**	
	In Nursery these building blocks will be observed and provided through rich opportunities in the environment for children to access independently. A daily maths lesson occurs in line with the Expectation of White Rose Maths Curriculum in Reception. Maths opportunities will be observed mainly within the mathematics area of learning and Communication,			**Year 2**
	Nursery	**Reception (inc ELG)**		
1. Number and place value	1. Develop fast recognition of up to 3 objects, without having to count them individually ('subitising'). 2. Recite numbers past 5. 3. Say one number for each item in order: 1,2,3,4,5. 4. Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle'). 5. Show 'finger numbers' up to 5. 6. Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.	1. Count objects, actions and sounds. 2. Subitise 3. Link the number symbol (numeral) with its cardinal number value. 4. Count beyond 10. 5. Compare numbers. 6. Have a deep understanding of number to 10, including the composition of each number. 7. Subitise up to 5 8. Verbally count beyond 20, recognising the pattern of the counting system. 9. Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.	1. Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. 2. Count, read and write numbers to 100 in numerals, count in multiples of twos, fives, and tens 3. Given a number, identify one more and one less 4. Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least 5. Read and write numbers from 1 to 20 in numerals and words.	1. Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward 2. Recognise the place value of each digit in a two-digit number (tens, ones) 3. Identify, represent and estimate numbers using different representations, including the number line 4. Compare and order numbers from 0 up to 100; use and = signs 5. Read and write numbers to at least 100 in numerals and in words 6. Use place value and number facts to solve problems.
2. Number – addition and subtraction.	1. Experiment with their own symbols and marks as well as numerals. 2. Solve real world mathematical problems with numbers up to 5. 3. Compare quantities using language: 'more than', 'fewer than'.	1. Understand the 'one more than/one less than' relationship between consecutive numbers. 2. Explore the composition of numbers to 10. 3. Automatically recall number bonds for numbers 0–5 and some to 10.	1. Read, write, and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs 2. Represent and use number bonds and related subtraction facts within 20	1. Solve problems with addition and subtraction: 2. Using concrete objects and pictorial representations, including those involving numbers, quantities, and measures

		4. Automatically recall number bonds up to 5 and some number bonds to 10, including double facts.	3. Add and subtract one-digit and two-digit numbers to 20, including zero 4. Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = – 9	3. Applying their increasing knowledge of mental and written methods 4. Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 5. 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 - show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot - recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
Number – multiplication and division	1. Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle'). 2. Solve real world mathematical problems with numbers up to 5.	1. Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.	1. 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.	1. Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers 2. Calculate mathematical statements for multiplication and division within the

				multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs 3. Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot 4. Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.
Number - fractions	1. Compare quantities using language: 'more than', 'fewer than'	1. Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.	2. Recognise, find, and name a half as one of two equal parts of an object, shape or quantity 3. Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.	1. Recognise, find, name and write fractions 3 1 , 4 1 , 4 2 and 4 3 of a length, shape, set of objects or quantity 2. Write simple fractions for example, 2 1 of 6 = 3 and recognise the equivalence of 4 2 and 2 1 .
Measurement	2. Compare quantities using language: 'more than', 'fewer than' 3. Make comparisons between objects relating to size, length, weight and capacity.	1. Compare length, weight, and capacity.	1. Compare, describe, and solve practical problems for: - lengths and heights [for example, long/short, longer/shorter, tall/short, double/half - Mass/weight [for example, heavy/light, heavier than, lighter than] - Capacity and volume [for example, full/empty, more	1. Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels 2. Compare and order lengths, mass, volume/capacity and

			than, less than, half, half full, quarter] - -Time [for example, quicker, slower, earlier, later] 2. Measure and begin to record the following: - lengths and heights - mass/weight - capacity and volume - time (hours, minutes, seconds) 3. Recognise and know the value of different denominations of coins and notes 4. Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] 5. Recognise and use language relating to dates, including days of the week, weeks, months and years 6. Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	record the results using >, < and = 3. Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value 4. Find different combinations of coins that equal the same amounts of money 5. Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change 6. Compare and sequence intervals of time 7. Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times 8. Know the number of minutes in an hour and the number of hours in a day.
Geometry-properties of shape	1. Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles, and cuboids)using informal and mathematical language: - 'sides', - 'corners'; - 'straight',	1. Select, rotate and manipulate shapes to develop spatial reasoning skills. 2. Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.	1. Recognise and name common 2-D and 3-D shapes, including: 2. 2-D shapes [for example, rectangles (including squares), circles and triangles] 3. 3-D shapes [for example, cuboids (including cubes), pyramids and spheres].	1. Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line 2. Identify and describe the properties of 3-D shapes,

	- 'flat', - 'round'. 2. Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc. 3. Combine shapes to make new ones – an arch, a bigger triangle, etc.			including the number of edges, vertices, and faces 3. Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] 4. Compare and sort common 2-D and 3-D shapes and everyday objects.
Geometry – position and direction	1. Understand position through words alone – for example, "The bag is under the table," – with no pointing. 2. Describe a familiar route. 3. Discuss routes and locations, using words like 'in front of' and 'behind'. 4. Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc. 5. Extend and create ABAB patterns – stick, leaf, stick, leaf. 6. Notice and correct an error in a repeating pattern. 7. Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'	1. Continue, copy and create repeating patterns.	1. Describe position, direction and movement, including whole, half, quarter and three quarter turns.	1. Order and arrange combinations of mathematical objects in patterns and sequences 2. Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise).