Mathematics

Our Vision

Applying fluency in concepts and reasoning skills to solve and understand problems in the real world.

Intent

At the Oaks Federation, our aim is to give children exciting and engaging learning opportunities that develop a love of learning. These are based on our Learning Values; 'push yourself', 'don't give up', 'understand others', 'explore' and 'imagine', as well as giving children opportunities to express and practise our Christian Values of 'love', 'compassion' and 'respect'. Our teaching and learning approach to maths is centred around the Concrete/Pictorial/Abstract (CPA) approach. We strive to embed our teaching through real-life contexts, making appropriate links across the curriculum. We aim to weave the three National Curriculum objectives of Fluency, Problem Solving and Reasoning into all units of maths learning. These objectives are connected and interdependent skills. We hope to have pupils who think mathematically, learn to use a wide range of methods to allow for deeper understanding and confidence when they tackle reasoning and problem solving. Emphasis is placed on number fluency to support rapid recall of maths facts in order to support children's efficiency in the reasoning and problem solving of maths concepts. This in turn supports children to achieve mastery in a concept with a deeper, more secure and adaptable understanding.

Implementation

Our curriculum is built upon a spiral approach from Year R to Year 2 with lessons and learning experiences planned sequentially over time to aid progression and understanding, building upon previous learning. In the Early Years, children begin their learning journey and love of maths with lessons, activities and continuous provision based upon White Rose focusing on developing a deep understanding of number. As the children begin to secure their understanding of number, planning is supported by Hamilton Trust. This high quality mathematic teaching will prepare the children for continuing the Hamilton Trust Learning Journey into mixed years in KS1.

In KS1, within mixed year classes, planning continues to be supported by Hamilton Trust, which allows children to be immersed in high quality mathematic teaching. Fluency, Problems Solving and Reasoning opportunities are supplemented with other trusted resources such as White Rose, NRich and NCTEM. Year 1/2 lessons are taught whole class with matched but appropriate learning objectives for each year, following a progressive and enriched sequence. The year groups are taught inputs with high quality first teaching from the class teacher with differentiated questioning to push and challenge those that need it. The children then get opportunities to practise their new learning in groups, pairs or individually. When children have shown proficiency in the fluency of a maths concept and begin to master the it, they use their reasoning and problem-solving skills to develop their depth of learning. However, all children will be given opportunities to develop their problem solving and reasoning skills during investigative lessons weaved into the learning journey of a maths concept. Pupils who need additional support are given targeted interventions including keep-up, catch-up sessions on the day or within the week.

Impact

When pupils leave the Oaks Federation, their learning in Maths will have enabled them to be fluent at manipulating number; able to reason confidently and solve both routine and non-routine tasks, using an appropriate and efficient method. The children will give tackling problems a go utilising the learning values and Christian values of our federation, understanding that mistakes and errors are good and a natural and inspiring part of learning. Using their high-quality maths education, they will be able to tackle the real world with an inquisitive, investigative mind and with an attitude of enjoyment and excitement.

Early Years Foundation Stage

Key Objectives EYFS
(Statutory framework for the early years foundation stage, 2023)

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Mathematics ELG:

Number

Children at the expected level of development will:

- Have a deep understanding of number to 10, including the composition of each number;
- Subitise (recognise quantities without counting) up to 5;
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

Numerical Patterns

Children at the expected level of development will:

- Verbally count beyond 20, recognising the pattern of the counting system;
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Our vision statement states that our Federation is striving to ensure children are future ready. Therefore, throughout the Foundation Stage, opportunities for children to develop, practise and explore their mathematics skills are created throughout the curriculum in continuous provision opportunities to begin their journey towards this.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn 1	Intro Home Visits Baseline			Understanding Numbers 0-10 White Rose Year R			
Autumn 2	Understanding Numbers 0-10 White Rose Year R				Understanding Number (15 days)		
Spring 1	Numbers and Sets (15 Days)		Comparison and Measure (15 Days)		Pattern (10 Days)		
Spring 2	Shape (10 Days)		Understanding Number (15 days)		Addition and Subtraction (15 Days		
Summer 1	Weight (10 Days)		Time (5 days)	Money and Coins (10 Days)		Shape (10 Days)	
Summer 2	Understand Number (15 Days)		Addition and Subtraction (15 Days)		Patterns (15 Days)		Measure (10 Days) Shape (10 Days)

Key Stage One

<table>
<tr><td colspan="3">Key Objectives Year One (National Curriculum 2014)
Children will learn:</td></tr>
<tr>
<td>Number – Place Value
count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s
given a number, identify 1 more and 1 less
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
read and write numbers from 1 to 20 in numerals and words</td>
<td>Number – Addition & Subtraction
read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs
represent and use number bonds and related subtraction facts within 20
add and subtract one-digit and two-digit numbers to 20, including 0
solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9</td>
<td>Number – Multiplication & Division
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</td>
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<tr>
<td>Number – Fractions
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</td>
<td>Measure
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 than, less than, half, half full, quarter]
time [for example, quicker, slower, earlier, later]
measure and begin to record the following:
lengths and heights
mass/weight
capacity and volume
time (hours, minutes, seconds)
recognise and know the value of different denominations of coins and notes
sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]
recognise and use language relating to dates, including days of the week, weeks, months and years</td>
<td>Geometry - Shape
recognise and name common 2-D and 3-D shapes, including:
2-D shapes [for example, rectangles (including squares), circles and triangles]
3-D shapes [for example, cuboids (including cubes), pyramids and spheres]
Geometry – Position & Direction
describe position, direction and movement, including whole, half, quarter and three-quarter turns</td>
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	• tell the time to the hour and half past the hour and draw the hands on a clock face to show these times	
Key Objectives Year Two (National Curriculum 2014) *Children will learn:*		

Number – Place Value
• count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward
• recognise the place value of each digit in a two-digit number (10s, 1s)
• identify, represent and estimate numbers using different representations, including the number line
• compare and order numbers from 0 up to 100; use <, > and = signs
• read and write numbers to at least 100 in numerals and in words
• use place value and number facts to solve problems
	Number - addition and subtraction
	• 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
	• 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 representations, and mentally, including:
	  • a two-digit number and 1s
	  • a two-digit number and 10s
	  • 2 two-digit numbers
	  • adding 3 one-digit numbers
	• show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 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
		• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
		• calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
		• show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot
		• solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Number - fractions	Statistics	Measurement	Geometry - properties of shapes
• recognise, find, name and write fractions 1/3, ¼, 2/4 and 3/4of a length, shape, set of objects or quantity • write simple fractions, for example 1/2 of 6 = 3 and recognise the equivalence of 2/4 and ½	• interpret and construct simple pictograms, tally charts, block diagrams and tables • ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • ask-and-answer questions about totalling and comparing categorical data	• 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 • compare and order lengths, mass, volume/capacity and record the results using >, < and = • recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • find different combinations of coins that equal the same amounts of money • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change • compare and sequence intervals of time • 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 • know the number of minutes in an hour and the number of hours in a day	• identify and describe the properties of 2-D shapes, including the number of sides, and line symmetry in a vertical line • identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] • compare and sort common 2-D and 3-D shapes and everyday objects Geometry - position and direction • order and arrange combinations of mathematical objects in patterns and sequences • 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 anti-clockwise)

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn 1	Place Value (11 days)			Addition and Subtraction (13 days)			Measure Length (3 days)
Autumn 2	Measure Money **Year 1 – Just Recognising coins and denominations objectives** (5 days)	Measure Time (4 days)	Addition and Subtraction (15 Days)				Multiplication (5 days)
Spring 1	Place Value (5 days)	Addition and Subtraction (15 days)			Fraction – Half/Quar **Autumn** (2 Days)	Measure Weight (2 days) Capacity (3 Days)	

Spring 2	Measure Time (3 Days)	Addition and Subtraction (10 Days)	Shape (7 days)	Fraction (5 days)	
Summer 1	Multiplication and Division **Spring** (10 days)	Pos + Time (3 Days)	PV, Addition and Subtraction (12 days)		
Summer 2	Multiplication, Division and using Money (11 days)		Shape, Time and Data (8 Days)	CONSOLIDATION or Revision or Calculation (2 weeks)	