Killamarsh Infant and Nursery School

Key Learning in Mathematics

Curriculum Intent

At Killamarsh Infant and Nursery School, we strive to make maths fun, purposeful and interesting for all children. We aim to equip all pupils with the skills and confidence to solve a range of problems through fluency with numbers and mathematical reasoning. Children are encouraged to see the mathematics that surround them every day and enjoy developing vital life skills in this subject. We use White Rose to underpin our planning. We aim for every child to develop a sound understanding of maths, equipping them with the skills of calculation, reasoning and problem solving that they need in life beyond school. They will be given access to a variety of mathematical opportunities, which will enable them to make the connections in learning, develop and use new vocabulary and discuss their learning. By working across different representations of learning and using resources, we aim for our children to be confident mathematicians who are independent, inquisitive and not afraid to take risks.

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

Curriculum Implementation

Our curriculum incorporates the coverage of the statutory outcomes outlined in the Early Years Foundation Stage (September 2021) and KS1 Mathematics Programme of Study – National Curriculum 2014. Our planning is based on the White Rose Maths Schemes of Learning to guarantee consistency, coherence and progression throughout the EYFS and KS1. In addition staff refer to other materials to support short-term planning. These are used across EYFS and KS1 allowing children to be exposed to a variety of different types of learning and problems to solve. Teachers implement our schools' agreed Calculation Policy of Concrete, Pictorial and Abstract (CPA). To learn mathematics effectively, some things have to be learned before others and this order of small step learning is factored into our planning (e.g. place value needs to be understood before working with addition). At Killamarsh Infant and Nursery School, we have an

emphasis on number skills first, carefully ordered, throughout the curriculum. We encourage children to count confidently have a deep understanding of the numbers to 10. We support our children to become visualisers, describers and experimenters. Our pupils engage and enjoy using concrete resources to experiment and complete practical activities such as ten frames for organising and counting. We help our children to be visualisers through using the CPA approach. This helps pupils understand mathematics and to make connections between different representations. We give children the opportunity to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. We encourage our pupils to become describers as we place a great emphasis on the mathematical language and questioning so pupils can discuss the mathematics they are doing. Sentence stems are regularly used during whole class discussions to support our younger children to learn mathematical language and develop their ability to reason. We support our children to become experimenters as we want pupils to love and learn more about mathematics.

Children take part in explicit daily mathematics lessons with a specific focus on either Number or Measure, Geometry or Statistics. All areas of the mathematics curriculum are continually revisited through planned short or longer in-depth teaching sequences to enable children to develop a depth of understanding. At Killamarsh Infant and Nursery School, we regularly give our children opportunities to use and apply their mathematical learning in everyday situations, aiming to embed mathematical skills across the curriculum.

Curriculum Impact

The impact of our high-quality maths curriculum will be to develop children who are confident, keen and unafraid mathematicians who are equipped with a wealth of knowledge to draw upon to solve problems.
We measure how well we are doing by:

- Assessing our children's outcomes against the ELGs for EYFS and the end of Key stage 1 expectations for Y1 and Y2.
- Monitoring the work children do and their response and attitudes to learning.
- Speaking with children so that they can demonstrate their developing skills and knowledge and show what they know, can do and to check they remember more than they did before.

A Mathematician in Nursery	A Mathematician in Reception	A Mathematician in Year One	A Mathematician in Year Two
Knowledge/Skills **Number** • Develop fast recognition of up to three objects without having to count them individually (subitising) • Recite numbers past five • Say one number for each item in order	**Knowledge/Skills** **Number** • Have a deep understanding of number to 10, including the composition of each number • Subitise (recognise quantities without counting) up to 5	**Knowledge/Skill** **Number – number and 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.	**Knowledge/Skills** **Number – number and place value** • Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward • Recognise the place value of each digit in a two-digit number (tens, ones)

• Know that the last number reached when counting a small set of objects tells you how many there are in total (cardinal principle) • Show finger numbers up to five • Link numerals and amounts up to five • Experiment with their own symbols and marks as well as numerals • Solve real world mathematical problems with numbers up to five **Numerical Patterns** • Compare quantities using language (more than, fewer than) • Talk about and explore 2D and 3D shapes using informal and mathematical language • Understand position through words alone • Describe a familiar route • Discuss routes and locations • Make comparisons between objects relating to size, length, weight and capacity • Select shapes appropriately • Combine shapes to make new ones • Talk about and identify patterns around them • Extend and create ABAB patterns • Notice and correct an error in a repeating pattern • Begin to de scribe a sequence of events (real or fictional)	• 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** • 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.	• Count in multiples of twos, fives and tens • Given a number, identify one more and one 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 **Number – addition and 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 zero • Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 – ?= 9. **Number – multiplication and 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 **Number – fractions** • Recognise, find and name a half as one of two equal parts of an object, shape or quantity -recognise, find	• Identify, represent and estimate numbers using different epresentations, 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 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

		and name a quarter as one of four equal parts of an object, shape or quantity **Measurement** 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 • Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. **Geometry – properties of shapes**	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 two numbers can be done in any order (commutative) and division of one 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** • Recognise, find, name and write fractions 3 1 , 4 1 , 4 2 and 4 3 of a length, shape, set of objects or quantity • Write simple fractions for example, 2 1 of 6 = 3 and recognise the equivalence of 4 2 and 2 1. **Measurement** • 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

		• 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 and direction** • Describe position, direction and movement, including whole, half, quarter and three quarter turns	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. **Geometry – properties of shapes** • 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 anticlockwise). **Statistics** • Interpret and construct simple pictograms, tally charts, block diagrams and simple 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.
Key vocabulary: number, order, count, how many? altogether, more, fewer, less, shapes, big, small, long, short, full, empty, heavy, light, pattern, repeating pattern, forwards, backwards	**Key Vocabulary:** add, take away, total, number bonds, more than, fewer than, less than, greater than, the same as, quantity, even, odd, double, equals, measure, compare, longer than, shorter than, heavier than, lighter than, time,	**Key Vocabulary:** plus, subtract, minus, makes, altogether, symbol, digit, missing number problem, numeral, part whole model, multiplication, sharing (division), divide, fraction, half, quarter, 2D shape names, 3D shape names, number sentence, sum, estimate, tens, units, ones, length, height, capacity, o'clock, half past, hours, minutes, seconds, days of the week, months, coins, chronological order language, pence, pound	**Key Vocabulary:** partition, inverse, commutative, calculation, multiply, divide, division, thirds, place value, comparison symbols, arrays, equivalent, reasoning, explain, check, equation, representation, bar model, times tables, difference between, balances, quarter past, quarter to, ass, volume, notes, standard units, temperature, properties, vertices, side, edge, vertex, surface, face, flat, curved, millimetres, kilograms, millilitres, litre, grams