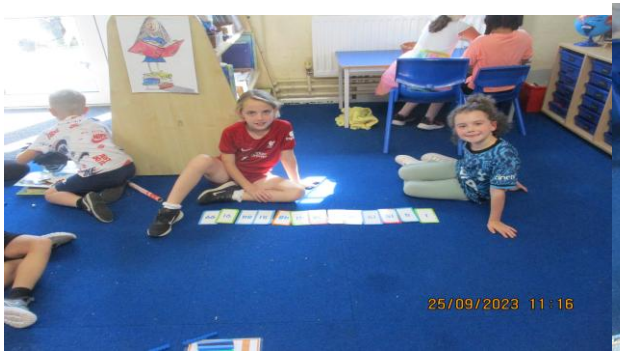
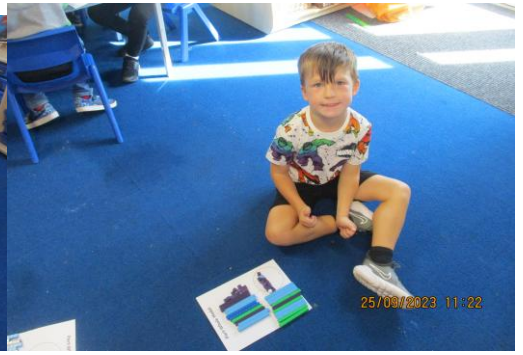
Mathematics at

Letchmore Infants' and Nursery School





Subject Intent Statement

The basic skills of mathematics are vital for the life opportunities of our children. At Letchmore Infants' school, we are embedding and sustaining our Mathematics Mastery curriculum to ensure every child can achieve excellence in mathematics. We want our children to experience a sense of awe and wonder as they solve problems for the first time. Our aim is for all children to think mathematically, enabling them to reason, solve problems and assess risk in a range of contexts. We will foster positive attitudes; fascination and excitement of discovery to ensure pupils become fluent in the fundamentals of mathematics. As a school, we want our children to develop a 'can do' attitude and perceive themselves as mathematicians.

ELG	• Recite numbers past 5 • 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 are in total (cardinal principle) • Develop fast recognition of up to 3 objects without having to count them individually. (subitising) • 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. • Experiment with their own symbols and marks as well as numerals. • Link numerals and amounts for example, showing the right number of objects to match the numeral , up to 5. • Compare quantities using language more than, fewer than. • Begin to describe a sequence of events, real or fictional using words such as 'first, then.	• Count objects, actions and sounds. • • Count beyond 10 • Subitise. • Link the number symbol (numeral) with its cardinal number value. • Compare numbers • Understand the 'one more than/one less than relationship between consecutive numbers. • Explore the composition of numbers to 10. • Solve real world mathematical problems with numbers up to 5. • Begin to describe a sequence of events, read or fictional using words such as first, then.	• 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 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 • Pupils practise counting (1, 2, 3), ordering (for example, first, second, third), or to indicate a quantity (for example, 3 apples, 2 centimetres), including solving simple concrete problems, until they are fluent. • Pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations. • They practise counting as reciting numbers and counting as enumerating objects, and counting in twos, fives and tens from different multiples to develop their recognition of patterns in the number system (for example, odd and even numbers), including varied and frequent practice through increasingly complex questions. • They recognise and create repeating patterns with objects and with shapes.	• count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward • recognise the place value of each digit in a two-digit number (tens, ones) • 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 • Using materials and a range of representations, pupils practise counting, reading, writing and comparing numbers to at least 100 and solving a variety of related problems to develop fluency. They count in multiples of three to support their later understanding of a third. • As they become more confident with numbers up to 100, pupils are introduced to larger numbers to develop further their recognition of patterns within the number system and represent them in different ways, including spat ial representations. • Pupils should partition numbers in different ways (for example, 23 = 20 + 3 and 23 = 10 + 13) to support subtraction. They become fluent and apply their knowledge of numbers to reason with, discuss and solve problems that emphasise the value of each digit in two-digit numbers. They begin to understand zero as a place holder.
	Nursery	Reception	Year 1	Year 2

Addition and Subtraction	• Develop fast recognition of up to 3 objects without having to count them individually (subitising) • Know that the last number reached when counting a small set of objects tells you how mnay there are in total (cardinal principle) • Show finger numbers up to 5. • Explore the composition of numbers to 10. • Solve real world mathematical problems with numbers up to 5. • Begin to describe a sequence of events, real or fictional using words such as first, then.	• Automatically recall number bonds 0-5 and some to 10. . • Subitise • Explore the composition of numbers to 10.	• *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 pi ctorial representations, and missing number problems such as 7 = □ - 9* • Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example, 9 + 7 = 16; 16 - 7 = 9; 7 = 16 - 9). They should realise the effect of adding or subtracting zero. This establishes addition and subtraction as related operations. • Pupils combine and increase numbers, counting forwards and backwards. • They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.	• 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 calculations and missing number problems • Pupils extend their understanding of the language of addition and subtraction to include sum and difference. • Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using 3 + 7 = 10, 10 - 7 = 3 and 7 = 10 - 3 to calculate 30 + 70 = 100, 100 - 70 = 30 and 70 = 100 - 30. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5). This establishes commutativity and associativity of addition. • Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers.
		Reception	Year 1	Year 2
Multiplication and Division		• Explore the composition of number to 10.	• 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 • Through grouping and sharing small quantities, pupils begin to understand: 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

			doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities. • They make connections between arrays, number patterns, and counting in twos, fives and tens.	methods, and multiplication and division facts, including problems in contexts • Pupils use a variety of language to describe multiplication and division. • Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. • Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, 40 ÷ 2 = 20, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4 × 5 = 20 and 20 ÷ 5 = 4).
	Nursery	Reception	Year 1	Year 2
Fractions	•	•	• recognise, find and name a half as one of two equal parts of an object, shape or quantity • recognise, find and name a quarter as one of four equal parts of an object, shape or quantity • Pupils are taught half and quarter as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities.	• recognise, find, name and write fractions $^{1}/_{3}$, $^{1}/_{4}$, $^{2}/_{4}$ and $^{3}/_{4}$ of 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 $^{1}/_{2}$

			• For example, they could recognise and find half a length, quantity, set of objects or shape. • Pupils connect halves and quarters to the equal sharing and grouping of sets of objects and to measures, as well as recognising and combining halves and quarters as parts of a whole.	
	Nursery	Reception	Year 1	Year 2
Geometry	• Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language, sides, corners, straight, flat, round. • Select shapes appropriately: flat surfaces for building a triangular prism for a roof etc. • Combines shapes to make a new ones, an arch, a bigger triangle etc. • Understand position through words alone – for example 'The bag is under the table' – with no pointing • Describe a familiar route. • Discuss routes and locations using words like 'in front of' and 'behind'. • Talk about and identify the patters around them. For example stripes on clothes, designs on rugs and	• Select, rotate and manipulate shapes in order to develop spatial reasoning skills. • Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as in numbers. • Draw information from a simple map • Continue and create repeating patterns.	• 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] • Pupils handle common 2-D and 3-D shapes, naming these and related everyday objects fluently. They recognise these shapes in different orientations and sizes, and know that rectangles, triangles, cuboids and pyramids are not always similar to each other. • describe position, direction and movement, including whole, half, quarter and three-quarter turns • Pupils use the language of position, direction and motion, including: left and	• identify and describe the properties of 2-D shapes, including the number of sides and 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 • Pupils handle and name a wider variety of common 2-D and 3-D shapes including: quadrilaterals and polygons, and cuboids, prisms and cones, and identify the properties of each shape (for example, number of sides, number of faces). • Pupils identify, compare and sort shapes on the basis of their properties and use vocabulary precisely, such as sides, edges, vertices and faces. • Pupils read and write names for shapes that are appropriate for their word reading and spelling. • Pupils draw lines and shapes using a straight edge. • 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)

	wallpaper. Use informal language like 'pointy' 'spotty' 'blobs' etc. • Extend and create ABAB patterns – stick leaf, stick leaf. • Notice and correct an error in a repeating pattern.		right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside. • Pupils make whole, half, quarter and three-quarter turns in both directions and connect turning clockwise with movement on a clock face.	• Pupils should work with patterns of shapes, including those in different orientations. • Pupils use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts (for example, pupils themselves moving in turns, giving instructions to other pupils to do so, and programming robots using instructions given in right angles).
	Nursery	Reception	Year 1	Year 2
Measurement	• Make comparisons between objects relating to size, length, weight and capacity. • Begin to describe a sequence of events, real or fictional, using words such as first, then.	• Compare length, weight and capacity.	• 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 • [full/empty, more than, less than, half, half full, quarter] • time [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	• 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 • Pupils use standard units of measurement with increasing accuracy, using their knowledge of the number system. They use the appropriate language and record using standard abbreviations. • Comparing measures includes simple multiples such as 'half as high'; 'twice as wide'.

			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 • The pairs of terms: mass and weight, volume and capacity, are used interchangeably at this stage. • Pupils move from using and comparing different types of quantities and measures using non-standard units, including discrete (for example, counting) and continuous (for example, liquid) measurement, to using manageable common standard units. • In order to become familiar with standard measures, pupils begin to use measuring tools such as a ruler, weighing scales and containers. • Pupils use the language of time, including telling the time throughout the day, first using o'clock and then half past.	• They become fluent in telling the time on analogue clocks and recording it. • Pupils become fluent in counting and recognising coins. They read and say amounts of money confidently and use the symbols £ and p accurately, recording pounds and pence separately.

	Nursery	Reception	Year 1	Year 2
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 • Pupils record, interpret, collate, organise and compare information (for example, using many-to-one correspondence in pictograms with simple ratios 2, 5, 10).

Whole school - How is maths taught

Nursery -

- Small group work.
- Child initiated learning.
- Daily counting fo children and snack.
- Everyday mathematical language used daily (days of the week, positional language etc.)

Reception -

- Whole class learning 3 times a week.
- Small group work 3 times a fortnight.
- Child initiated learning including maths learning challenges.
- Daily counting of children and snack.
- Everyday mathematical language used daily (days of the week, positional language etc.)

Year 1 -

- Whole class and group work.

- Child initiated learning including maths learning challenges.
- Everyday mathematical language used daily (counting, days of the week, positional language etc.)
- Cross curricular links within all subjects.
- Maths mastering number sessions every day.

Year 2 -

- Whole class and group work.
- Child initiated learning including maths learning challenges.
- Everyday mathematical language used daily (counting, days of the week, positional language etc.)
- Cross curricular links within all subjects.
- Maths mastering number sessions every day.

Early Learning Goals

- Verbally count beyond 20, recognising the pattern of the counting system.
  Subitise (recognise quantities without counting)up to 5.
- Compare quantities up to 10 in different contexts, recognising when one quantity if greater than, less than or the same as the other quantity.
- Have a deep understanding of numbers to 10, including the composition of each number.
- 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.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be evenly distributed.

End of Key Stage Outcomes

KS1 ARE

- read scales* in divisions of ones, twos, fives and tens
- partition any two-digit number into different combinations of tens and ones, explaining their thinking verbally, in pictures or using apparatus
- add and subtract any 2 two-digit numbers using an efficient strategy, explaining their method verbally, in pictures or using apparatus (e.g. 48 + 35; 72 – 17)
- recall all number bonds to and within 10 and use these to reason with and calculate bonds to and within 20, recognising other associated additive relationships (e.g. If 7 + 3 = 10, then 17 + 3 = 20; if 7 – 3 = 4, then 17 – 3 = 14; leading to if 14 + 3 = 17, then 3 + 14 = 17, 17 – 14 = 3 and 17 – 3 = 14)
- recall multiplication and division facts for 2, 5 and 10 and use them to solve simple problems, demonstrating an understanding of commutativity as necessary • identify 1 4, 1 3, 1 2, 2 4, 3 4, of a number or shape, and know that all parts must be equal parts of the whole
- use different coins to make the same amount • read the time on a clock to the nearest 15 minutes • name and describe properties of 2-D and 3-D shapes, including number of sides, vertices, edges, faces and lines of symmetry.

Greater depth

- read scales* where not all numbers on the scale are given and estimate points in between • recall and use multiplication and division facts for 2, 5 and 10 and make deductions outside known multiplication facts
- use reasoning about numbers and relationships to solve more complex problems and explain their thinking (e.g. 29 + 17 = 15 + 4 + □; 'together Jack and