EYFS Mathematics Education Programme (Statutory)

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.

Key Knowledge and Skills:

- Count objects, actions and sounds.
- Subitise.
- Link the number symbol (numeral) with its cardinal number value.
- Count beyond ten.
- Compare numbers.
- Understand the 'one more than/one less than' relationship between consecutive numbers.
- Automatically recall number bonds for numbers 0–5 and some to 10.
- Select, rotate and manipulate shapes to develop spatial reasoning skills.
- Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.
- Continue, copy and create repeating patterns.
- Compare length, weight and capacity.

ELG: Number (Statutory)

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.

	ELG: Numerical Patterns (Statutory) 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.		
	3 and 4 year olds	**Children in Reception**	
Number	Uses some number names and number language spontaneously Uses some number names accurately in play Recites numbers in order to 10 Knows that numbers identify how many objects are in a set Is beginning to represent numbers using fingers, marks on paper or pictures Sometimes matches numeral and quantity correctly Shows curiosity about numbers by offering comments or asking questions Compares two groups of objects, saying when they have the same number Shows an interest in number problems Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same Shows an interest in numerals in the environment	Recognises some numerals of personal significance as well as 1 to 5 Counts up to three or four objects, including those which cannot be moved Counts objects to 10, and beginning to count beyond 10 Counts out up to six objects from a larger group and an irregular arrangement of up to ten objects Selects the correct numeral to represent 1 to 5, then 1 to 10 objects Estimates how many objects he/she can see and checks by counting Uses the language of "more" and "fewer" to compare two sets Finds the total number of items in two groups by counting all of them Says the number that is one more than a given number Finds one more or less from a group of up to five or ten objects Is beginning to use the vocabulary involved in adding and subtracting Records, using marks that he/she can interpret and explain Begins to identify his/her own mathematical problems based on his/her own interests and fascinations **Counts reliably with numbers from 1 to 20, places them in order and says which number is one more or one less than a given number (ELG)**	**Estimates a number of objects and checks quantities by counting up to 20 (ELG Exc)** **Solves practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups (ELG Exc)**

	Shows an interest in representing numbers Realises not only objects, but anything can be counted, including steps, claps or jumps		**Adds and subtracts, using quantities and objects, 2 single-digit numbers, and counts on or back to find the answer (ELG)** **Solves problems, including doubling, halving and sharing (ELG)**			
Skills	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Number and Place Value	**Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number** **Count and read/write numbers to 100 in numerals** **Count in multiples of twos, fives and tens from 0** **Identify one more and one less of a given number** 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 Count in twos, fives and tens to solve problems Partition and combine numbers using apparatus if required	**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) Identify, represent and estimate numbers using different representations **Compare and order numbers from 0 up to 100; use <, > and = signs** Read and write numbers to at least 100 in numerals and words **Use place value and number facts to solve problems** Partition two-digit numbers into different combinations of tens and ones Use reasoning about numbers and relationships to solve more complex problems and explain his/her thinking	**Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number** **Recognise the place value of each digit in a three-digit number** Compare and order numbers up to 1000 Identify, represent and estimate numbers using different representations Read and write numbers up to 1000 in numerals and words **Solve number problems and practical problems involving these ideas**	**Count in multiples of 6, 7, 9, 25 and 1000** Find 1000 more or less than a given number **Count backwards through zero to include negative numbers** Recognise the place value of each digit in a four-digit number **Order and compare numbers beyond 1000** Identify, represent and estimate numbers using different representations including measures **Round any number to the nearest 10, 100 or 1000** Solve number and practical problems that involve all of the above and with increasingly large positive numbers Read Roman numerals to 100 (I to C)	**Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit. Find the difference between the largest and smallest whole numbers that can be made from using three digits** Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 **Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero** Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 Solve number problems and practical problems that involve ordering and comparing numbers to 1 000 000, counting forwards or backwards in steps, interpreting negative numbers and rounding	Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit **Round any whole number to a required degree of accuracy** **Use negative numbers in context, and calculate intervals across zero** Solve number and practical problems that involve ordering and comparing numbers to 10 000 000, rounding to a required degree of accuracy, using negative numbers and calculating intervals across zero Demonstrate an understanding of place value including decimals e.g. 28.13 = 28 + ? + 0.03

		Recall the multiples of 10 below and above any given 2 digit number			Read Roman numerals to 1000 (M) and recognise years written in Roman numerals	
Addition and Subtraction	Read, interpret and write mathematical statements involving addition (+), subtraction (-) and equals (=) signs Demonstrate an understanding of the commutative law (e.g. 3 + 2 = 5, therefore 2 + 3 = 5) Demonstrate an understanding of inverse relationships involving addition and subtraction Recall at least four of the six number bonds for 10 **Represent and use number bonds within 20** **Represent and use subtraction facts within 20** Add and subtract one-digit and two-digit numbers to 20, including zero Solve one-step problems that involve addition, subtraction and missing numbers using concrete objects and pictorial representations	**Solve problems with addition and subtraction using concrete objects and pictorial representations** **Solve problems with addition and subtraction applying his/her increasing knowledge of written methods and mental methods** Recall all number bonds to and within 10 and use these to reason with and calculate bonds to and within 20 **Recall and use addition and subtraction facts to 20** Add and subtract numbers using concrete objects, pictorial representations, and mentally 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 Recall doubles and halves to 20	**Add and subtract numbers mentally, including a three-digit number and ones** Add numbers with up to three digits using the formal method of columnar addition **Add and subtract numbers mentally, including a three-digit number and tens** Subtract numbers with up to three digits using the formal method of columnar subtraction **Add and subtract numbers mentally, including a three-digit number and hundreds** Estimate the answer to a calculation and use inverse operations to check answers Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	Add numbers with up to four digits using the formal method of columnar addition Estimate and use inverse operations to check answers to a calculation Subtract numbers with up to four digits using the formal method of columnar subtraction **Solve addition and subtraction two-step problems in contexts**	**Add and subtract whole numbers with more than 4 digits, including using formal written methods** **Add and subtract numbers mentally with increasingly large numbers** Use rounding to check answers to calculations **Solve addition and subtraction multi-step problems in contexts**	Perform mental calculations with mixed operations to carry out calculations involving the four operations **Solve multi-step problems in contexts** Solve problems involving addition and subtraction **Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy**

		Use estimation to check that his/her answers to a calculation are reasonable Solve missing number problems using addition and subtraction				
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	**Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers** 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 concrete materials and mental methods as well as using arrays, repeated addition and multiplication and division facts** Use multiplication and division facts for 2, 5 and 10 to make deductions outside known multiplication facts Solve word problems involving multiplication and division with more than one step Recognise the relationships between addition and subtraction and rewrite addition statements as	**Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables** **Write and calculate mathematical statements for multiplication and division using the multiplication tables that he/she knows** Solve problems, including missing number problems, involving multiplication and division	**Recall multiplication and division facts for multiplication tables up to 12 × 12** Use place value to multiply and divide mentally Recognise and use factor pairs and commutativity in mental calculations Multiply two-digit and three-digit numbers by a one-digit number using formal written layout Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit	**Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers** Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers Establish whether a number up to 100 is prime and recall prime numbers up to 19 Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers Multiply and divide numbers mentally drawing upon known facts Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	**Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication** **Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding** Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context Perform mental calculations, including with mixed operations and large numbers Identify common factors, common multiples and prime numbers Use his/her knowledge of the order of operations to carry out calculations involving the four operations

		simplified multiplication statements			Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 Recognise and use square and cube numbers **Solve problems involving multiplication and division** **Solve problems involving multiplication and division**	Solve problems involving addition, subtraction, multiplication and division **Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy**
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	**Recognise, find, name and write fractions 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity and demonstrate understanding that all parts must be equal parts of the whole** Write simple fractions for example, 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2	**Count up and down in tenths** **Recognise, find and write fractions of a discrete set of objects** Recognise and use fractions as numbers **Recognise and show, using diagrams, equivalent fractions with small denominators** Add and subtract fractions with the same denominator within one whole Compare and order unit fractions, and fractions with the same denominators Solve fraction problems Record 1/10 as 0.1, 3/10 as 0.3 etc	**Recognise and show, using diagrams, families of common equivalent fractions** **Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten** Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities Add and subtract fractions with the same denominator Recognise and write decimal equivalents of any number of tenths or hundredths and to 1/4, 1/2, ¾ Find the effect of dividing a one- or two-digit number by 10 and 100	**Compare and order fractions whose denominators are all multiples of the same number** Write equivalent fractions of a given fraction, represented visually, including tenths and hundredths Recognise mixed numbers and improper fractions and convert from one form to the other Add and subtract fractions with the same denominator and denominators that are multiples of the same number Multiply proper fractions and mixed numbers by whole numbers **Read and write decimal numbers as fractions** Recognise and use thousandths and relate them	Use common factors to simplify fractions Compare and order fractions Add and subtract fractions with different denominators and mixed numbers Multiply simple pairs of proper fractions Divide proper fractions by whole numbers Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 Multiply one-digit numbers with up to two decimal places by whole numbers **Use written division methods in cases where the answer has up to two decimal places**

				Round decimals with one decimal place to the nearest whole number Compare numbers with the same number of decimal places up to two decimal places **Solve simple measure and money problems involving fractions and decimals to two decimal places**	to tenths, hundredths and decimal equivalents Round decimals with two decimal places to the nearest whole number and to one decimal place **Read, write, order and compare numbers with up to three decimal places** Recognise the per cent symbol (%) and write percentages as a fraction with denominator 100, and as a decimal **Solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25**	**Solve problems which require answers to be rounded to specified degrees of accuracy** **Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts**
Measurement	**Compare, describe and solve practical problems for lengths, heights, mass and capacity** **Compare, describe and solve practical problems for time** Measure and begin to record mass/weight, capacity, time Recognise and know the value of different denominations of coins and notes Sequence events in chronological order using language e.g. before and after	Choose and use appropriate standard units to estimate and measure Compare and order lengths, mass, volume/capacity and record the results using >, < and = Recognise and use symbols for pounds (£) and pence (p) Find different combinations of coins that equal the same amounts of money **Solve simple problems in a practical context involving**	**Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)** Measure the perimeter of simple 2-D shapes **Add and subtract amounts of money to give change** **Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks**	**Convert between different units of measure e.g. kilometre to metre; hour to minute** Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres Find the area of rectilinear shapes by counting squares Estimate, compare and calculate different measures, including money in pounds and pence	**Convert between different units of metric measure** Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints **Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres** **Calculate and compare the area of rectangles (including squares), and estimate the area of irregular shapes**	Solve problems involving the calculation and conversion of units of measure **Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa** Convert between miles and kilometres Recognise that shapes with the same areas can have

	Recognise and use language relating to dates **Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times**	**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 Remember the number of minutes in an hour and the number of hours in a day Read scales in divisions of ones, twos, fives and tens Read scales where not all numbers on the scale are given and estimate points in between Read the time on a clock to the nearest 15 minutes	Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight Know the number of seconds in a minute and the number of days in each month, year and leap year Compare durations of events e.g. to calculate the time taken by particular events or tasks	Read, write and convert time between analogue and digital 12- and 24-hour clocks Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days	Estimate volume e.g. using 1 cm^3 blocks to build cuboids (including cubes) and capacity Solve problems involving converting between units of time Use all four operations to solve problems involving measure	different perimeters and vice versa Recognise when it is possible to use formulae for area and volume of shapes Calculate the area of parallelograms and triangles Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units e.g. mm^3 and km^3
Properties of Shape	**Recognise and name common 2-D shapes e.g. rectangles (including squares), circles and triangles** **Recognise and name common 3-D shapes e.g. cuboids (including cubes), pyramids and spheres**	Identify and describe the properties of 2-D and 3-D shapes Name some common 2-D and 3-D shapes from a group of shapes or from pictures of the shapes and describe some of their properties Identify 2-D shapes on the surface of 3-D shapes e.g. a circle on a cylinder and a triangle on a pyramid	Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them Recognise angles as a property of shape or a description of a turn **Identify right angles and identify whether other angles are greater or less than a right angle**	**Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes** Identify acute and obtuse angles and compare and order angles up to two right angles by size **Identify lines of symmetry in 2-D shapes presented in different orientations**	Identify 3-D shapes from 2-D representations Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles **Draw given angles, and measure them in degrees (°)** Identify angles at a point and one whole turn (total 360°) and on a straight line and ½ turn (total 180°)	Draw 2-D shapes using given dimensions and angles Recognise, describe and build simple 3-D shapes, including making nets **Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons**

		Compare and sort common 2-D and 3-D shapes and everyday objects describing similarities and differences	**Recognise that two right angles make a half turn, three make three quarters of a turn and four a complete turn** Identify horizontal and vertical lines and pairs of perpendicular and parallel lines	Complete a simple symmetric figure with respect to a specific line of symmetry Begin to recognise where angles are greater than two right angles. Know the term straight angle referring to two right angles together	Identify other multiples of 90° Use the properties of rectangles to deduce related facts and find missing lengths and angles **Distinguish between regular and irregular polygons based on reasoning about equal sides and angles**	Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
Position and Direction	Describe position, direction and movement, including whole, half, quarter and three-quarter turns	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)**		Describe positions on a 2-D grid as coordinates in the first quadrant Describe movements between positions as translations of a given unit to the left/right and up/down **Plot specified points and draw sides to complete a given polygon**	Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed	Describe positions on the full coordinate grid (all four quadrants) **Draw and translate simple shapes on the coordinate plane, and reflect them in the axis**
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**	**Interpret and present data using bar charts, pictograms and tables** Solve one-step and two-step questions, using information presented in scaled bar charts and pictograms and tables	Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs **Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs**	Solve comparison, sum and difference problems using information presented in a line graph **Complete, read and interpret information in tables, including timetables**	**Interpret and construct pie charts and line graphs and use these to solve problems** **Calculate and interpret the mean as an average**

Ratio and Proportion						Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts e.g. find 7/9 of 108 **Solve problems involving the calculation of percentages e.g. of measures, and such as 15% of 360 and the use of percentages for comparison** Solve problems involving similar shapes where the scale factor is known or can be found **Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples**
Algebra						**Use simple formulae e.g. perimeter of a rectangle or area of a triangle** Generate and describe linear number sequences Express missing number problems algebraically Find pairs of numbers that satisfy an equation with two unknowns Enumerate possibilities of combinations of two variables