Maths Skills, Knowledge and Progression Plan 2022-2023

Nursery	**Autumn** Number - Children will rote count to 5. - Children will explore a variety of number songs. Numerical Patterns - Children will begin to sort objects by colour and size. - Children will show an interest in 2D shapes in the environment. - Children will compare objects using the language big and small. **Spring** Number - Children will use 1:1 correspondence to 5. - Children will know that they can represent amounts on their fingers. - Children will rote count to 10. - Children will begin to recognise objects having more or less objects. Numerical Patterns - Children will begin to name 2D shapes. - Children will use the language tall, short, long, big and small. **Summer** Number - Children will count to 10 using 1:1 correspondence. - Children will begin to subitise to 3. - Children can recognise numerals to 3 and will begin to make corresponding marks. Numerical Patterns - Children will name and describe the properties of 2D shapes. - Children will become more familiar with making an AB pattern. - Children will use the language heavy, light full and empty.

Reception	**Autumn** Number - Children can accurately count to 10. - Children can compose and compare numbers to 5. Numerical Patterns - Children will create AB patterns and begin to create ABB patterns. - Children will know some properties of 2D shapes. - Children will be able to identify how a group of objects have been sorted. **Spring** Number - Children can identify 1 more and 1 less than a given number. - Children will know number bonds to 5. - Children will recognise, compose and compare numbers within 10. Numerical Patterns - Children will use the language: big, small, tall, short, heavy, light, narrow, wide full and not full when making comparisons. - Children will be able to describe 3D shapes and their properties. - Children will explore length and height using non-standard measures. **Summer** Number - Children can accurately count objects within 20 using 1:1 correspondence. - Children can subitise up to 5. - Children can compare numbers within 10, using the language: more than, less than. - Children can identify the composition of numbers to 10. - Children will recall number bonds within 10. - Children can count forwards and backwards within 10. Numerical Patterns - Children will become more familiar with 3D shapes and know that they are made up of 2D faces. - Children will identify even and odd numbers to 10. - Children will equally share between two.

Key Concepts	**Critical Knowledge**					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**

Number and place value	Count, read and write numbers up to 100 in numerals. Order numbers up to 100. Identify 1 more or 1 less than a given number. Identify and represent numbers using objects and pictorial representations	Count in steps of 2, 3, 5 and 10 from 0 and in tens from any number, forwards and backwards. Recognise the place value of each digit in a two digit number and partition in different ways. Identify, represent and estimate numbers to 100 using different	Read and write numbers up to 1000 in numerals and words. Identify, represent and estimate numbers using different representations. Find 10 or 100 more or less than a given three digit number. Recognise the place value of each digit in a	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.	Read, write, order and compare numbers to at least 1,000,000 including numbers with up to two decimal places and determine the value of each digit. Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero.	Read, write, order and compare numbers up to 10 000 000, and decimals with up to three decimal places, and determine the value of each digit, partitioning them in different ways. Round any number including decimals to a required degree of accuracy.

	including the number line. Use the language of equal to, more than, less than, fewer, most and least. Identify the number of ones and tens in a two digit number. Identify odd and even numbers.	representations including the number line. Compare and order numbers from 0 up to 100 using <, > and = signs. Read and write numbers to at least 100 in numerals and words. Use place value and number facts to solve problems.	three digit number and partition in different ways. Compare and order numbers up to 1000 using <, > and =. Count from 0 in multiples of 50 and 100. Use place value knowledge to solve number and practical problems.	Round any number to the nearest 10, 100 or 1000. Find the effect of dividing a one or two digit number by 10 or 100, identifying the value of the digits in the answer as ones, tenths and hundredths. 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.	Multiply and divide whole numbers and decimals by 10, 100 and 1000. Round any number up to 1000000 to the nearest 10, 100, 1000, 10000 and 100000 and round numbers with up to two decimal places. Use rounding to check answers to calculations. Read, write, order and compare numbers with up to three decimal places. Solve number problems and practical problems that involve all of the above.	Use negative numbers in context, and calculate intervals across zero. Solve number and practical problems that involve all of the above . Multiply numbers by 10, 100 and 1000 giving answers up to 3dp.
Addition and subtraction	Add and subtract one digit numbers up to 50 including zero. Read, write and interpret mathematical statements including addition (+), subtraction (-) and equals (=) signs. Represent and use number bonds and related subtraction facts to 20. Solve one step problems that involve addition and subtraction using	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.	Add and subtract numbers mentally, including: a three digit number and ones; a three digit number and tens; a three digit number and hundreds. Add and subtract number with up to three digits using an appropriate method. Estimate the answer to a calculation and use inverse operations to check answers.	Add and subtract whole numbers with up to 4 digits using an appropriate written or mental method. Add and subtract whole numbers and decimals using an appropriate written method. Estimate and use inverse operations to check answers to a calculation and solve problems.	Add and subtract numbers mentally with increasingly large numbers. Add and subtract whole numbers with more than 4 digits, including using an appropriate method. Solve addition and subtraction multi-step problems in contexts deciding which operations and methods to use and why.	Solve addition and subtraction multi step problems, including problems which involve decimals, in contexts, deciding which operations and methods to use and why. Perform mental calculations, including with mixed operations and large numbers. Use their knowledge of the order of operations to carry out calculations

	concrete objects, pictorial representations and missing number problems.	Show that the addition of two numbers can be done in any order but subtraction cannot. Recognise and use the inverse operation and use this to check calculations and solve missing number problems. Solve problem with addition and subtraction using concrete objects, pictorial representations, mental and written strategies.	Solve problems, including missing number problems, using number facts, place value facts and more complex addition and subtraction.	Solve addition and subtraction two step problems in contexts, deciding which operations and methods to use and why.		involving the four operations.
Multiplication and division	Count in multiples of 2s, 5s and 10s. Double numbers up to 20. Halve even numbers up to 20. Solve one step problems involving multiplication by calculating the answer using concrete objects, pictorial representations and arrays with support if needed.	Recall and use multiplication facts for the 2, 5 and 10 times tables. Calculate mathematical statements for multiplication and write them using the x, ÷ and = signs. Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and time table facts. Show that the multiplication of two numbers can be done in any order but division cannot.	Recall and use multiplication and division facts for the 3, 4, 6 and 8 times tables. Write and calculate mathematical statements for multiplication and division using the multiplication tables they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and	Recall and use multiplication and division facts for multiplication tables up to 12 x 12. Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. Recognise and use factor pairs and commutativity in mental calculations. Multiply two digit and three digit numbers by a one digit number using an appropriate method.	Multiply and divide numbers mentally drawing upon known facts. Multiply and divide whole numbers by 10, 100 and 1000. Multiply numbers up to 4 digits by a one or two digit number using a an appropriate written method. Divide numbers up to 4 digits by a one digit number using an appropriate method of and interpret remainders appropriately for the context.	Multiply multi-digit number up to 4 digits by a 2 digit number using an appropriate written method. Divide numbers up to 4 digits by a 1 and 2 digit whole number using the an appropriate written method, and interpret remainders as whole number remainders, fractions or by rounding as appropriate for the context. Identify common factors, common multiples and prime numbers. Use their knowledge of the order of operations to carry out calculations

			multiplication and division facts, including problems in context.	Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.	Solve problems involving multiplication and division. Solve problems involving addition and subtraction, multiplication and division and a combination of these, including understanding the use of the equals sign. Recognise and use square numbers and cube numbers and their notations. 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.	involving the four operations.
Fractions (including decimals, percentages,	Recognise, find and name a half as one of two equal parts of an object, shape or quantity.	Recognise, find, name and write fractions 1/2, 2/4, 1/3, 1/4 and 3/4 of length, shape, set of objects or quantity.	Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.	Recognise and show, using diagrams, families of common equivalent fractions. Solve problems involving increasingly	Compare and order fractions whose denominators are multiples of the same number.	Add and subtract fractions with different Denominations and mixed numbers, using the concept of equivalent fractions.

ratio, proportion and algebra)	Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.	Write simple fractions, i.e. ½ of 6 = 3. Recognise the equivalence of ½ and 2/4.	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit 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. Recognise and show, using diagrams, equivalent fractions with small denominators. Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. Count up and down in tenths. Solve problems that involve all of the above.	harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number. Add and subtract fractions with the same denominator. Recognise and write decimal equivalents of any number of tenths or hundredths. Recognise and write decimal equivalents to 1⁄4, 1⁄2 and 3⁄4.	Identify, name and 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 and write mathematical statements >1 as a mixed number. Calculate and solve problems which involve finding fractions of numbers and quantities, including simple scaling problems. 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, supported by materials and diagrams. Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with	Multiply simple pairs of proper fractions, writing the answer in its simplest form. Divide proper fractions by whole numbers. Generate and describe linear number sequences (with fractions). Identify and find equivalent fractions for any given fraction, including mixed number. Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. Compare and order fractions, including fractions > 1 including converting between mixed numbers and improper fractions. Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number. Associate a fraction with division and calculate

					denominator 100, and as a decimal. Solve problems which require knowing percentage and decimal equivalents of 1⁄2, 1⁄4, 3/4, 1/5, 2/5, 3/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25. Read and write decimal numbers as fractions.	decimal fraction equivalents. Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. Solve problems involving the calculation of percentages and the use of percentages for comparison. Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. Use simple formulae. 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.
Measures	Recognise and know the value of different denominations of coins and notes.	Find different combinations of coins that equal the same amounts of money.	Add and subtract amounts of money to give change, using both £ and p in practical contexts.	Solve simple measure and money problems involving fractions and decimals to two decimal places.	Solve problems involving converting between units of time. Calculate time	Calculate, estimate and compare volume of cubes and cuboids using standard units.

	Compare, describe and solve practical problems for heights using the terms longer, shorter, taller, smaller. Tell the time to the hour and half hour and draw hands on a clock to show them. Compare, describe and solve practical problems for time using the terms quicker, slower, earlier, later. Measure and record time in hours, minutes and seconds. Use language relating to dates, including days of the week, months and years. Sequence events in chronological order. Measure and begin to record length and height using standard and non-standard units. Use language related to capacity and volume, i.e. full, empty. Compare and begin to record capacity and volume using non-standard units.	Use addition and subtraction skills to calculation change. Tell and write the time to 5 minutes, including quarter past/to the hour and draw the hands on a clock face to show these times. Know the number to minutes in an hour and the number of hours in a day. Choose and use the appropriate standard unit to estimate and measure capacity (litres/ml). Compare and order volume/ capacity/ length/ mass and record results using <, > and =. Choose and use the appropriate standard unit to estimate and measure length/height (m/cm) and mass (kg/g). Estimate and measure temperature.	Tell and write the time from an analogue clock, including 12-hour and 24-hour clocks. Estimate and read time with increasing accuracy to the nearest minute. Know the number of seconds in a minute and the number of days in each month, year and leap year. Record and compare time in terms of seconds, minutes and hours and compare durations of events. Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml). Measure the perimeter of simple 2D shapes.	Estimate, compare and calculate different measures, including money in pounds and pence. 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. Convert between different units of measure [i.e. km to m, kg to g etc.] Measure and calculate the perimeter of a rectilinear figure (including squares) in cm and m. Find the area of rectilinear shapes by counting squares, and begin to understand the formula for the area of a rectangle.	durations including interpreting timetables. Convert between different units of metric measure. Estimate volume. Measure and calculate the perimeter of composite rectilinear shapes in cm and m. Calculate and compare the area of rectangles (including squares), and including using standard units. Estimate the area of irregular shapes.	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate. 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, using decimal notation to up to 3dp. Convert between miles and kilometers. Recognise that shapes with the same areas can have 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.

	Use language related to weight and mass, i.e. heavy, light. Compare and begin to record weight using non-standard units.					
Geometry – properties of shape	Recognise and name common 2D shapes in different orientations and sizes. Recognise and name common 3D shapes in different orientations and sizes.	Identify and describe and properties of 2D shapes, including the number to sides and line symmetry in a vertical line. Compare and sort common 2D shapes and everyday objects. Order and arrange combinations of objects in patterns and sequences. Identify and describe the properties of 3D shapes, including the number of edges, vertices and faces. Identify 2D shapes on the surface of 3D shapes. Compare and sort common 3D shapes and everyday objects.	Draw, identify and classify 2-D shapes based on their properties, including horizontal and vertical lines. 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 whether angles are greater than or less than a right angle. Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.	Identify acute and obtuse angles and compare and order angles up to two right angles by size. Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. Identify lines of symmetry in 2D shapes presented in different orientations. Complete a simple symmetric figure respective to a specific line of symmetry.	Identify 3D shapes, including cubes and other cuboids, from 2D representations. 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. 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.	Solve problems involving similar shapes where the scale factor is known or can be found. Measure, compare and classify geometric shapes based on their properties, angles and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons. Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. Draw 2D shapes using given dimensions and angles. Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.

Geometry – position and direction	Use positional language such as right, left, above and below. Describe position, direction and movement, including whole, half, quarter and three-quarter turns.	Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line. Distinguish between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)	Recognise that two right angles make a half turn, three make three quarters of a turn and four a complete turn.	Describe positions on a 2D grid as coordinates in the first quadrant. Describe movements Between positions as translations of a given unit to the left/ right and up/ down.	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 axes.
Statistics		Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.	Interpret and present data using bar charts, pictograms and tables. Solve one- step and two-step questions (for example, 'How many more?' and 'How many fewer?') 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.	Interpret and construct pie charts and line graphs and use these to solve problems. Calculate the mean as an average.