KILLIGREW MATHS PROGRESSION MAP (STATUTORY COVERAGE and PROBLEM SOLVING PROGRESSION)

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Recall & Arithmetic Fluency	Compares two groups of objects, saying when they have the same number. Separates a group of three or four objects in different ways, and begins to recognise that the total is still the same. Verbally counts up to 10. Identifies up to 3 objects, without having to count them individually ('subitising'). Recites numbers past 5.	Subitise (recognise quantities without counting) up to 5 Counts objects, actions and sounds. Links numerals with its value. Counts beyond ten. Compares numbers up to 10. Understands the 'one more than/one less than' relationship between consecutive numbers.	Counts to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. Identifies one more and one less than a given number. Recalls number bonds to 10. Reorders numbers to find tens and some more (4 + 5 + 6 =). Recalls double and half facts to 10. Identifies one more and one less of a given number.	Counts in steps of 2, 3 and 5 from 0. Counts in tens from any number, forward and backward. Recalls and uses addition and subtraction facts to 20. Recalls and uses multiplication and division facts for the 2, 5 and 10 multiplication tables. Recalls the number of minutes in an hour and the number of hours in a day. Recognises different coins up to the value of £2 Recalls double and half facts to 20.	Counts from 0 in multiples of 4, 8, 50 and 100. Sums and finds the difference between pairs of numbers that are multiples of 10 and 100. Doubles and halves multiples of 10 or 100. Complements amounts to 100. Complements amounts to 60 (time). Complements tenths to 1. Complements fractions with the same denominator that make 1. Easily recalls x 3, x 4, x 8	Counts in multiples of 6, 7, 9, 25 and 1000. Counts backwards through zero to include negative numbers. Finds 1000 more or less than a given number. Reviews addition and subtraction facts within 20, ensuring application to 10, 100 and 1000 (6 + 3, 60 + 30, 600 + 300, 6000 + 3000) Doubles and halves of multiples of 10, 100 or 1000 (6 + 6, 60 + 60, 600 + 600, 6000 + 6000) Easily recalls multiplication and division facts to 12	Counts forwards and backwards with positive and negative whole numbers, including through zero. Counts forwards or backwards in steps of powers of 10 for any given number up to 1000 000. Adds and subtracts numbers mentally with increasingly large numbers. Multiplies and divides numbers mentally drawing upon known facts. Applies all the multiplication tables and related division facts frequently, commits them to memory and uses	Performs mental calculations, including mixed operations and large numbers. Performs mental calculations, including mixed operations and large numbers. Continues to use all the multiplication tables to calculate mathematical statements.

		Explores the composition of numbers to 10. Automatically recalls (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. Verbally counts beyond 20, recognising the pattern of the counting system.			multiplication facts (including the inverse). Recalls the number of seconds in a minute, days in a month and days in a year including a leap year.	x 12 and multiplication and division by zero and one facts. Divides and multiplies by 10 and 100. Converts kilometres to metres, hours to minutes, years to months and weeks to days. Complements hundredths that make 1.	them confidently to make larger calculations.	
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Number and Place Value	Uses some number names and number language spontaneously. Recites numbers to 10 in order. Shows an interest in representing numbers.	Have a deep understanding of number to 10, including the composition of each number Verbally count beyond 20, recognising the pattern of the counting system Explore and represent	Counts to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. Counts, reads and writes numbers to 100 in numerals. Counts in multiples of twos, fives and tens.	Counts in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward. Recognises the place value of each digit in a two-digit number (tens, ones). Identifies, represents and	Counts from 0 in multiples of 4, 8, 50 and 100. Finds 10 or 100 more or less than a given number. Recognises the place value of each digit in a three-digit number.	Counts in multiples of 6, 7, 9, 25 and 1000. Finds 1000 more or less than a given number. Counts backwards through zero to include negative numbers. Recognises the place	Reads, writes, orders and compares numbers to at least 1 000 000 and determine the value of each digit. Counts forwards or backwards in steps of powers of 10 for any given number up to 1 000 000.	Reads, writes, orders and compares numbers up to 10 000 000 and determine the value of each digit. Rounds any whole number to a required degree of accuracy. Uses negative numbers in context and

	Shows an interest in numerals in the environment. Shows curiosity about numbers by offering comments and asking questions. Says 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. Show 'finger numbers' up to 5. Links numerals and amounts (showing the right number of objects to match the	patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally Subitises quantities up to 5. Compare quantities up to 10 in different contexts, using the vocabulary greater than, less than or the same as. Explores and represents patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.	Identifies one more and one less of a given number. Identifies and represents numbers using objects and pictorial representations. Uses a number line and the language of equal to, more than, less than (fewer), most, least. Reads and writes numbers from 1 to 20 in numerals and words.	estimates numbers using different representations, including a number line. Compares and orders numbers from 0 up to 100. Uses <, > and = signs. Reads and writes numbers to at least 100 in numerals and in words. Uses place value and number facts to solve problems. Partitions any two-digit number into different combinations of tens and ones. Explains their thinking verbally, in pictures or using apparatus.	Compares and orders numbers up to 1000. Identifies, represents and estimates numbers using different representations. Reads and writes numbers up to 1000 in numerals and in words. Solves number problems and practical problems involving these ideas.	value of each digit in a four-digit number. Orders and compares numbers beyond 1000. Identifies, represents and estimates numbers using different representations. Rounds any number to the nearest 10, 100 or 1000. Solves number and practical problems with increasingly large positive numbers. Reads Roman numerals to 100.	Interprets negative numbers in context, counts forwards and backwards with positive and negative whole numbers through zero. Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 Solves number problems and practical problems. Read Roman numerals to 1000 (M) and recognise years written in Roman numerals	calculates intervals across zero. Solves number and practical problems.

	numeral, up to 5). Experiment with their own symbols and marks as well as numerals. Compare quantities using language: 'more than', 'fewer than'.							
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Addition & subtraction	Realises not only objects can be counted but anything e.g. steps, claps and jumps. Beginning to represent numbers using fingers, marks on paper or pictures. Compare quantities using language: 'more than', 'fewer than'.	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. Compare quantities up to 10 in different contexts, using the vocabulary greater than, less than or the same as.	Reads, writes and interprets mathematical statements involving addition (+), subtraction (-) and equals (=) signs. Represents and uses number bonds and related subtraction facts within 20. Adds and subtracts one-digit and two-digit numbers to 20, including zero.	Solves problems with addition and subtraction by using concrete objects and pictorial representations (including those involving numbers, quantities and measures). Applies their increasing knowledge of mental and written methods. Recalls and uses addition and subtraction facts to 20 fluently.	Adds and subtracts numbers mentally, including: a three-digit number and ones a three-digit number and tens a three-digit number and hundreds. Adds and subtracts numbers with up to three digits, using formal written methods of columnar addition and subtraction.	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate Estimate and use inverse operations to check answers to a calculation Solves addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	Adds and subtracts whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). Adds and subtracts numbers mentally with increasingly large numbers. Uses rounding to check answers to calculations and determine, in the context of a	Performs mental calculations, including with mixed operations and large numbers. Uses their knowledge of the order of operations to carry out calculations involving the four operations. Solves addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

			Solves one-step problems that involve addition and subtraction (using concrete objects and pictorial representations). Solves missing number problems such as 7 = □ – 9.	Derives and uses related facts up to 100. Adds and subtracts 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 Shows that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. Recognises and uses the inverse relationship between addition and subtraction and uses this to check calculations and missing number problems.	Estimates the answer to a calculation and use inverse operations to check answers. Solves problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.		problem, levels of accuracy. Solves addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	Solves problems involving addition and subtraction, using estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

				Adds and subtracts any 2 two-digit numbers using an efficient strategy, explaining their method verbally, in pictures or using apparatus. Recalls all number bonds to and within 10. Uses these to calculate number bonds to and within 20, recognising other associated additive relationships.				
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Multiplication and Division		Shares a group of objects into two equal groups. Solve problems, including doubling, halving and sharing. Automatically recalls (without reference to rhymes, counting or other aids)	Solves one-step problems involving multiplication and division (using concrete objects, pictorial representations and arrays) with the support of the teacher.	Recalls and uses multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers. Calculates mathematical statements for multiplication and division within the multiplication tables and writes	Recalls and uses multiplication and division facts for the 3, 4 and 8 multiplication tables. Writes and calculates mathematical statements for multiplication and division using the multiplication tables that they know, including	Recalls multiplication and division facts for multiplication tables up to 12 × 12. Uses place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying	Identifies multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. Knows and uses the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.	Multiplies multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication. Divides numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and

		number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. Explores and represents patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.		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 Read scales in divisions of ones, twos, fives and tens	for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. Solves problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	together three numbers. Recognises and uses factor pairs and commutativity in mental calculations. Multiplies two-digit and three-digit numbers by a one-digit number using formal written layout. Solves 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.	Establishes whether a number up to 100 is prime and recall prime numbers up to 19. Multiplies numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers. Multiplies and divides numbers mentally drawing upon known facts. Divides 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. Multiplies and divides whole numbers and those involving decimals by 10, 100 and 1000.	interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context. Divides 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. Performs mental calculations, including with mixed operations and large numbers. Identifies common factors, common multiples and prime numbers. Uses their knowledge of the order of operations to carry

							Recognises and uses square numbers and cube numbers, and the notation for squared (2) and cubed (3) Solves problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes. Solves problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign. Solves problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	out calculations involving the four operations. Solves addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. Solve problems involving addition, subtraction, multiplication and division. Uses estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Fractions, Decimals and Percentages			Recognises, finds and names a half as one of two equal parts of an object, shape or quantity. Recognises, finds and names a quarter as one of four equal parts of an object, shape or quantity.	Recognises, finds, names and writes fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity and knows that all parts must be equal parts of the whole. Writes simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$	Counts up and down in tenths; recognises that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. Recognises, finds and writes fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. Recognises and uses fractions as numbers: unit fractions and non-unit fractions with small denominators. Recognises and shows, using diagrams, equivalent fractions with small denominators.	Recognise and show, using diagrams, families of common equivalent fractions Counts up and down in hundredths; recognises that hundredths arise when dividing an object by a hundred and dividing tenths by ten. Solves problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number. Adds and subtracts fractions with the same denominator.	Compare and order fractions whose denominators are all multiples of the same number Identifies names and writes equivalent fractions of a given fraction, represented visually, including tenths and hundredths. Recognises mixed numbers and improper fractions and converts from one form to the other and write mathematical statements > 1 as a mixed number (for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$) Adds and subtracts fractions with the same denominator and denominators that are multiples of the same number	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination Compares and orders fractions, including fractions >1 Adds and subtracts fractions with different denominators and mixed numbers, using the concept of equivalent fractions. Multiplies simple pairs of proper fractions, writing the answer in its simplest form (for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$) Divides proper fractions by whole numbers (for example, $\frac{1}{3} \div 2 = \frac{1}{6}$)

					Adds and subtracts fractions with the same denominator within one whole (for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$) Compares and orders unit fractions, and fractions with the same denominators Solve problems that involve all of the above	Recognises and writes decimal equivalents of any number of tenths or hundredths. Recognises and writes decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ Finds the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths Rounds decimals with one decimal place to the nearest whole number. Compares numbers with the same number of decimal places up to two decimal places. Solves simple measure and money problems	Multiplies proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. Reads and writes decimal numbers as fractions (for example, 0.71 = 71/100) Recognises and uses thousandths and relate them to tenths, hundredths and decimal equivalents Rounds decimals with two decimal places to the nearest whole number and to one decimal place. Reads, writes, orders and compares numbers with up to three decimal places.	Associates a fraction with division and calculate decimal fraction equivalents (for example, 0.375) for a simple fraction (for example, $\frac{3}{8}$) Identifies the value of each digit in numbers given to three decimal places, and multiplies and divides numbers by 10, 100 and 1000 giving answers up to three decimal places. Multiplies one-digit numbers with up to two decimal places by whole numbers. Uses written division methods in cases where the answer has up to two decimal places. Solves problems which require

						involving fractions and decimals to two decimal places.	Solves problems involving numbers up to three decimal places. Recognises the per cent symbol (%) and understands that per cent relates to "number of parts per hundred", 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 with a denominator of a multiple of 10 or 25	answers to be rounded to specified degrees of accuracy. Recalls and uses equivalences between simple fractions, decimals and percentages, including in different contexts.
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Measurement	Makes comparisons between objects relating to size, length, weight and capacity.	Uses everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and	Compares, describes and solves practical problems for lengths and heights. Uses appropriate mathematical	Chooses and uses appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g);	Measures, compares, adds and subtracts: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	Converts between different units of measure (for example, kilometre to metre; hour to minute).	Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram	Solves problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places

	Begins to describe a sequence of events, real or fictional, using words such as 'first', 'then...'	objects and to solve problems. Continues, copies and creates repeating patterns. Compares length, weight and capacity.	vocabulary for measurement. Measures and begins to record the following data: -length and height -mass/weight -capacity and volume -time (hours, minutes, seconds). Recognises and knows the value of different denominations of coins and notes. Sequences events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] Recognises and uses language relating to dates, including days of the week, weeks, months and years.	temperature (°C); capacity (litres/ml) to the nearest appropriate unit. Uses rulers, scales, thermometers and measuring vessels. Compares and orders lengths, mass, volume/capacity and record the results using >, < and = Recognises and uses symbols for pounds (£) and pence (p); combine amounts to make a particular value. Finds different combinations of coins that equal the same amount of money Solves simple problems in a practical context involving addition and subtraction of money of the same unit,	Measures the perimeter of simple 2-D shapes Adds and subtracts amounts of money to give change, using both £ and p in practical contexts. Tells and writes the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks. Estimates and reads time with increasing accuracy to the nearest minute. Records and compares time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight.	Measures and calculates the perimeter of a rectilinear figure (including squares) in centimetres and metres. Finds the area of rectilinear shapes by counting squares Estimates, compares and calculates different measures, including money in pounds and pence. Reads, writes and converts time between analogue and digital 12 and 24-hour clocks. Solves problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days	and kilogram; litre and millilitre). Understands and uses approximate equivalences between metric units and common imperial units such as inches, pounds and pints. Measures and calculates the perimeter of composite rectilinear shapes in centimetres and metres. Calculates and compares the area of rectangles (including squares) using standard units, square centimetres (cm2) and square metres (m2) and estimates the area of irregular shapes Estimates volume and capacity. Solves problems involving converting	where appropriate. Uses, reads, writes and converts 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 three decimal places. Converts between miles and kilometres. Recognises that shapes with the same areas can have different perimeters and vice versa Recognises when it is possible to use formulae for area and volume of shapes. Calculates the area of parallelograms and triangles.

			Tells the time to the hour and half past the hour and draws the hands on a clock face to show these times.	including giving change. Compares and sequences intervals of time. Tells and writes the time to five minutes, including quarter past/to the hour and draws the hands on a clock face to show these times. Knows the number of minutes in an hour and the number of hours in a day.	Knows the number of seconds in a minute and the number of days in each month, year and leap year. Compares durations of events.		between units of time. Uses all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation including scaling	Calculates, estimates and compares volume of cubes and cuboids using standard units, including centimetre cubed (cm3) and cubic metres (m3), and extending to other units.
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Geometry – properties of shapes	Shows an interest in shape and space by playing with shapes or making arrangements with objects. Shows awareness of similarities of shapes in the environment.	Explores the characteristics of everyday objects and shapes and uses mathematical language to describe them. Selects, rotates and manipulates shapes in order to develop spatial reasoning skills.	Recognises and names common 2-D and 3-D shapes.	Identifies and describes the properties of 2-D shapes, including the number of sides and symmetry in a vertical line. Identifies and describes the properties of 3-D shapes, including the number of edges, vertices and faces.	Draws 2-D shapes and makes 3-D shapes using modelling materials. Recognises 3-D shapes in different orientations and describes them. Recognises angles as a property of shape or a description of a turn.	Compares and classifies geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. Identifies acute and obtuse angles. Compares, and orders angles up to two right angles by size.	Identifies 3-D shapes, including cubes and other cuboids, from 2-D representations. Knows angles are measured in degrees: estimate and compare acute, obtuse and reflex angle. Draws given angles, and	Draws 2-D shapes using given dimensions and angles. Recognises, describes and builds simple 3-D shapes, including making nets. Compares and classifies geometric shapes based on their properties and

	Shows interest in shapes in the environment. Talks about and explores 2D and 3D shapes (circles, rectangles, triangles and cuboids). Uses informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'. Selects shapes appropriately (flat surfaces for building, a triangular prism for a roof). Combines shapes to make new ones (an arch, a bigger triangle). Talks about and identifies the patterns around them	Composes and decomposes shapes so that children recognise a shape can have other shapes within it, just as numbers can.		Identifies 2-D shapes on the surface of 3-D shapes. Compares and sorts common 2-D and 3-D shapes and everyday objects.	Identifies right angles, recognises that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle. Identifies horizontal and vertical lines and pairs of perpendicular and parallel lines.	Identifies lines of symmetry in 2-D shapes presented in different orientations Completes a simple symmetric figure with respect to a specific line of symmetry.	measures them in degrees (o). Identifies angles at a point and one whole turn (total 360 degrees) -angles at a point on a straight line and ½ a turn (total 180 degrees) -other multiples of 90 degrees. Uses the properties of rectangles to deduce related facts and find missing lengths and angles. Distinguishes between regular and irregular polygons based on reasoning about equal sides and angles.	sizes and finds unknown angles in any triangles, quadrilaterals and regular polygons. Illustrates and names parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. Recognises angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

	(stripes on clothes, designs on rugs and wallpaper). Uses informal language like 'pointy', 'spotty', 'blobs'. Extends and creates ABAB patterns (stick, leaf, stick, leaf).							
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Geometry – position and direction	Uses positional language Understands position through words alone for example, "The bag is under the table," – with no pointing. Describes a familiar route. Discusses routes and locations, using words like 'in	Can describe their relative position such as 'behind' or 'next to'.	Describes position, direction and movement, including whole, half, quarter and three-quarter turns.	Orders and arranges combinations of mathematical objects in patterns and sequences. Uses 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-		Describes positions on a 2-D grid as coordinates in the first quadrant. Describes movements between positions as translations of a given unit to the left/right and up/down. Plots specified points and draws sides to complete a given polygon.	Identifies, describes and represents the position of a shape following a reflection or translation, using the appropriate language.	Describes positions on the full coordinate grid (all four quadrants). Draws and translates simple shapes on the coordinate plane, and reflects them in the axes.

	front of' and 'behind'.			quarter turns (clockwise and anti-clockwise)				
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
				Interprets and constructs simple pictograms, tally charts, block diagrams and simple tables. Asks and answers simple questions by counting the number of objects in each category and sorting the categories by quantity. Asks and answers questions about totalling and comparing categorical data.	Interprets and presents data using bar charts, pictograms and tables. Solves one-step and two-step questions using information presented in scaled bar charts and pictograms and tables.	Interprets and presents discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. Solves comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	Solves comparison, sum and difference problems using information presented in a line graph. Completes, reads and interprets information in tables, including timetables.	Interprets and constructs pie charts and line graphs and uses these to solve problems. Calculates and interprets the mean as an average.
Year 6 Only								
Ration & proportion	Solves problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. Solves problems involving the calculation of percentages [for example, of measures, such as 15% of 360] and the use of percentages for comparison. Solves problems involving similar shapes where the scale factor is known or can be found. Solves problems involving unequal sharing and grouping using knowledge of fractions and multiples.							
Year 6 Only								
Algebra	Uses simple formulae. Generates and describes linear number sequences.							

		Expresses missing number problems algebraically. Finds pairs of numbers that satisfy an equation with two unknowns. Enumerates possibilities of combinations of two variables.						
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Problem Solving – Application Skills	Engaging in open ended activities. Solves real world mathematical problems with numbers up to 5. Notices and corrects an error in a repeating pattern.	Developing ideas of grouping, sequencing, cause and effect. Learning by trial and error. Making links and noticing patterns in their experiences.	<u>Finds a starting point</u> • Understands and uses known facts and procedures to solve simple problems • Uses familiar strategies and operations to solve problems within known mathematical concepts and procedures • Asks simple questions relevant to the problem and begins to suggest ways of exploring • Chooses equipment appropriate to the task with support • Selects the mathematics they use in an increasing range of classroom activities <u>Sorts information</u> • Solves problems with one or a small number of steps, where all steps are simple • Begins to organise work and check results e.g. shows evidence of methods in responses <u>Begins to look for patterns in results while working and uses them to find other possible outcomes</u> • Discusses their mathematical work and begins to explain their thinking using appropriate mathematical vocabulary		<u>Breaks the problem down into simpler steps</u> • Uses facts and procedures to solve simple and more complex problems • Develops own strategies for solving problems and applying mathematics to practical contexts • Poses and answers questions related to a problem and suggests a range of possible approaches to the solution • Develops the mathematics they use in a wide range of contexts • Chooses equipment appropriate to the task independently <u>Identifies irrelevant information; uses lists and tables to identify and organise</u> • Solves problems with one or a small number of steps, where all steps are simple • Begins to work in an organised way from the start using strategies such as recording results in order and checks for accuracy <u>Seeks a pattern</u>		<u>Uses a structured approach to tackle the problem (devise a plan) - Solves a simpler related problem</u> • Uses appropriate mathematical concepts, processes, skills and tools to solve a problem • Understands and uses facts and procedures creatively to solve complex or unfamiliar problems • Uses their mathematical experiences to explore ideas and raises questions to pursue further lines of enquiry • Selects the most appropriate equipment and explains choices • Identifies and obtains necessary information to carry through a task and solve mathematical problems • Recognises when information is or is not crucial to the solving of a problem determines what is missing and develops lines of enquiry <u>Organises, deconstructs and prioritises information; uses systematic lists and tables to identify information</u> • Organises work from the outset, looks for ways to record systematically and checks results to see if they are

			Draws simple pictures or diagrams • Describes a problem in their own words • Begins to develop own ways of recording Uses 'guess and check' strategy to solve unfamiliar problems • Tries different approaches and finds ways of overcoming difficulties when solving problems – sometimes with support		• Discusses their mathematical work and uses mathematical language in a more precise and accurate way Draws a diagram or model • Represents problems pictorially, using a model or with concrete resources • Presents work in a clear and organised way Uses informed 'guess and check' • Finds solutions that match the context of the problem		reasonable - checks for and spots errors while working • Solves problems with a larger number of numeric steps, at least one of which is more complex Identifies and uses a pattern • Constructs complex explanations and reasoned arguments Draws a mathematical model to support visualisation of a problem • Shows understanding of situations by describing them mathematically using symbols, words and diagrams • Decides how best to represent conclusions, using appropriate recording - begins to understand and use formulae and symbols to represent problems Uses informed 'guess, check and improve' • Interprets the mathematical solution in the context of the problem and makes sense of the solution
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Problem Solving –Reasoning Skills	Shows an interest in number problems.	Using objects, solve problems, including doubling, halving and sharing.	Finds a starting point • Recognises similarities to previous work through classroom practice • Begins to use familiar elements of knowledge to tackle problems that are less familiar or complex		Breaks the problem down into simpler steps • Poses and answers questions that will help make sense of the problem linked to previous work within mathematics and within other subjects.		Uses a structured approach to tackle the problem (devise a plan) - Solves a simpler related problem • Poses own questions and creates problems for peers that are similar to ones worked on in class • Develops own lines of enquiry	

			Gives examples to match statements and ones that do not • Understands a general statement by finding a particular example that match it • Provides simple reasons for opinions • Explains why an answer is correct • Reviews their work by explaining why they have done something Begins to look for patterns in results while working and uses them to find other possible outcomes • Begins to make simple inferences when referring to own work • Predicts an answer or outcome • Poses 'What if?' questions during practical problem solving opportunities Uses 'guess and check' strategy to solve unfamiliar problems • Talks about findings by referring to own work	Seeks an exception • Justifies answers and solutions by referring to their work and support with examples • Suggests refinements to elements of problem solving by comparing other approaches and against 'modelled' examples Seeks a pattern • Finds solutions and makes predictions by identifying patterns when working • Forms generalised rules in words, using concrete resources or own representation • Poses 'What if?' questions that may change the outcome or direction of the problem • Predicts conclusions and reasons why when referring to work • Makes valid inferences when referring to own work Uses informed 'guess and check' • Comments on whether the conclusion was expected	Organises, deconstructs and prioritises information; uses systematic lists and tables to identify information • Justifies methods chosen and why the solution is the best one or not Uses and applies negative proof (uses counter argument to prove the rule) • Supports conclusions with examples and counter examples • Considers efficiency of methods and adapts work accordingly throughout problem solving activities Identifies and uses a pattern • Identifies more complex patterns and begins to express generalisations using symbolic notation • Conjectures to develop own line of enquiry when testing outcomes Uses informed 'guess, check and improve' • Draws own valid conclusions and gives an explanation of reasoning (including written explanations)