KPI Progression for Maths

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number – number and place value	• Have a deep understanding of numbers to 10, including the composition of each number. • Subitise (recognise quantities without counting) up to 5 • Verbally count beyond 20, recognising the pattern of the counting system.	• Count reliably to 100 • Count on in 1s, 2s, 5s and 10s from any given number to 100 • Write all numbers in words to 20 • Say the number that is one more or one less than a number to 100 • 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)	• Read and write numbers to at least 100 in numerals and words • Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward. • Recognise the place value of each digit in a 2-digit numbers • Compare and order numbers from 0 to 100 using the >, < and = signs • Identify, represent and estimate numbers using different representations, including the number line • Use place value and number facts to solve problems	• Compare and order numbers to 1000 and read and write numbers in numerals and words • Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number • Recognise the value of each digit in a 3-digit number • Identify, represent and estimate numbers using different representations • Solve number problems and practical problems involving these ideas	• Count in multiples of 6, 7, 9, 25 and 1,000 • Find 1,000 more or less than a given number • Count backwards through 0 to include negative numbers • Recognise the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s) • Order and compare numbers beyond 1,000 • Identify, represent and estimate numbers using different representations • Round any number to the nearest 10, 100 or 1,000 • 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) and know that over time, the numeral system changed to include the concept of 0 and place value	• Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit • 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 0 • Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000 • Solve number problems and practical problems that involve all of the above • Read roman numerals to 1,000 (m) and recognise years written in roman numerals	• Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit • Use negative numbers in context, and calculate intervals across zero • Round any whole number to a required degree of accuracy • Solve problems which require answers to be rounded to a specific degree of accuracy

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Number – addition, subtraction, multiplication and division	• 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, 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.	• Read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs • Recall all pairs of addition and subtraction number bonds to 20 • Add and subtract 1-digit and 2-digit numbers to 20, including zero • Solve a missing number problem, such as: 5 = 8 - _ • Solve a one-step problem involving addition and subtraction using concrete objects and pictorial representations • Solve a one-step problem involving a multiplication and division, using concrete objects and pictorial representations and arrays	• Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • Add and subtract: two 1-digit; 2-digit and a 1-digit; 2-digit and 10s; two 2-digit and three 1-digit numbers • Solve problems involving addition and subtraction: • Using concrete objects and pictorial representations, including those involving numbers, quantities and measures • Applying their increasing knowledge of mental and written methods • Understand commutativity in relation to addition, subtraction, multiplication and division • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems • Recall and use multiplication and division facts for the 2, 5 and 10x multiplication tables, including recognising odd and even numbers • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 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	• Add and subtract mentally combinations of 1-digit and 3-digit numbers • Add and subtract numbers with up to 3-digits using formal written methods • Solve number problems using one and two step operation • Identify, represent and estimate numbers using different representations • Recall and use multiplication facts for 3, 4 and 8x multiplication tables • Write and calculate mathematical statements for multiplication and division (from facts they know i.e. 2, 3, 4, 5, 6 and 10) including 2-digit numbers times a 1-digit number • Solve 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	• 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 • Solve addition and subtraction two-step in context, deciding which operations to use and why. • Multiply 2-digit and 3-digit numbers by a 1-digit number using formal written layout • Recall all multiplication facts 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 3 numbers • Recognise and use factor pairs and commutativity in mental calculations • Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	• 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 and determine, in the context of a problem, levels of accuracy • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • Multiply and divide numbers mentally drawing upon known facts up to 12 x 12 • Recognise and use square numbers and cube numbers and the notation for squared (2) and cubed (3) • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • Multiply number up to 4-digit by a 1 or 2 digit number using formal written methods, including long multiplication for 2-digit numbers • Divide numbers up to 4-digits by 1-digit numbers • Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 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 • Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign • Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	• 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, as appropriate for the context • 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 their knowledge of the order of operations to carry out calculations involving the 4 operations • Solve 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 • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

Number – Fractions (including decimals and percentages)		• Recognise half and a quarter as being one of two or four equals parts of numbers or shapes	• Name the fractions 1/3, 1/4, 1/2, and 3/4 and find factional values of shapes; lengths and numbers • 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 that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators • Recognise and show, using diagrams, equivalent fractions with small denominators • Add and subtract fractions with a common denominator within one whole • Compare and order unit fractions, and fractions with the same denominators • Solve problems that involve all of the above	• Solve simple measures and money problems involving fractions and decimals to 2 decimal places • Compare numbers with the same number of decimal places up to 2 decimal places • Recognise and write decimal equivalents of any number of tenths or hundredths • Add and subtract with up to 4 decimal places using formal written methods of columnar addition and subtraction • Divide a 1 or 2-digit number by 10 or 100 identifying the value of the digits in the answer as units, tenths and hundredths • 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 100 and dividing tenths by 10 • 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 • Add and subtract fractions with the same denominator • Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ • Round decimals with 1 decimal place to the nearest whole number	• Compare and order fractions whose denominators are all multiples of the same number • 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 [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$] • 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 • Read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$] • Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place • Read, write, order and compare numbers with up to 3 decimal places • Solve problems involving number up to 3 decimal places • Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction • Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25	• Use common factors to simplify fractions; use common multiples to express fractions in the same denomination • Compare and order fractions, including fractions >1 • Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] • Divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$] • Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$] • Identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places • Multiply one-digit numbers with up to 2 decimal places by whole numbers • Use written division methods in cases where the answer has up to 2 decimal places • 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

Ratio and proportion							• Solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts • Solve problems involving the calculation of percentages [for example, 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 • Generate and describe linear number sequences • Express missing number problems algebraically • Find pairs of numbers that satisfy an equation with 2 unknowns • Enumerate possibilities of combinations of 2 variables

Measurement		• Recognise all coins: - 1; 50p; 20p; 10p; and 1p
		• Name the days of the week and months of the year
		• Tell the time to o' clock and half past the hour
		• Compare, describe and solve practical problems for:
		  • Lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]
		  • Mass/weight [for example, heavy/light, heavier than, lighter than]
		  • Capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]
		  • Time [for example, quicker, slower, earlier, later]
		• Compare, describe and solve practical problems for:
		  • Lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]
		  • Mass/weight [for example, heavy/light, heavier than, lighter than]
		  • Capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]
		  • Time [for example, quicker, slower, earlier, later]
			• Choose and use appropriate standard units to estimate length/ height/ temperature and capacity to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
			• Compare and order lengths, mass, volume/capacity and record the results using >, < and =
			• Tell and write the time to 5 minute intervals
			• Recognise and use the symbols £ and p when solving problems involving addition and subtraction of money
			• Find different combinations of coins that equal the same amounts of money
			• Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
			• Compare and sequence intervals of time
			• Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times
			• Know the number of minutes in an hour and the number of hours in a day
				• 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, using both £ and p in practical contexts
				• Tell and write the time from an analogue clock, including using roman numerals from i to xii, and 12-hour and 24-hour clocks
				• 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, am/pm, 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 [for example, to calculate the time taken by particular events or tasks]
					• Measure and calculate the perimeter of a rectilinear figure in centimetres and metres
					• Read, write and convert between analogue and digital 12 and 24 hour clocks
					• Convert between different units of measure [for example, kilometre to metre; hour to minute]
					• Find the area of rectilinear shapes by counting squares
					• Estimate, compare and calculate different measures, including money in pounds and pence
					• Solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days
						• Convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]
						• 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), including using standard units, square centimetres (cm^2) and square metres (m^2), and estimate the area of irregular shapes
						• Estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water]
						• Solve problems involving converting between units of time
						• Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling
							• Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 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 3 decimal places
							• Convert between miles and kilometres
							• 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
							• 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 [for example, mm^3 and km^3]

Geometry – properties of shapes		• Recognise and name the 2D shapes: circle; triangle; rectangle, square and oblong
		• Recognise and name the 3D shapes: cube; sphere; cuboid, pyramid
			• Identify and describe the properties of 2-D shapes, including the number of sides, and line symmetry in a vertical line
			• Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
			• Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]
			• Compare and sort common 2-D and 3-D shapes and everyday objects
				• Identify right angles; compare other angles to being greater or smaller than a right angle
				• Identify horizontal and vertical lines and pairs of perpendicular and parallel lines
				• 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
					• Compare and classify geometrical shapes, including quadrilaterals and triangles based on their properties and sizes
					• Know that angles are measured in degrees and identify acute and obtuse angels and compare and order angles up to two right angles by size
					• Identify lines of symmetry in 2-D shapes presented in different orientations
					• Complete a simple symmetric figure with respect to a specific line of symmetry
						• Identify 3-D shapes, including cubes and other cuboids, 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 1 whole turn (total 360°)
						  • Angles at a point on a straight line and half a turn (total 180°)
						  • 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
							• 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
							• 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

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Geometry – 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 4 quadrants) • Draw and translate simple shapes on the coordinate plane, and reflect them in the axes
Statistics			• Interpret and construct 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 problems using information presented in scaled bar charts, 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