Maths Progression of Skills

Number: Number and Place Value						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Subitise (recognise quantities without counting) up to 5						
Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally						
Verbally count beyond 20, recognising the pattern of the counting system	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.			Count backwards through zero to include negative numbers.	Interpret negative numbers in context, count forwards and backwards with positive and negative numbers through zero.	Use negative numbers in context and calculate intervals across zero.
	Read and write numbers from 1 to 20 in numerals and words.					
	Count, read and write numbers to 100 in numerals.	Read and write numbers to at least 100 in numerals and in words.	Read and write numbers up to 1000 in numerals and in words.		Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit.	Read, write, order and compare numbers to at least 10,000,000 and determine the value of each digit.
Have a deep understanding of number to 10, including the composition of each number		Recognise the place value of each digit in a two-digit number (tens and ones).	Recognise the place value of each digit in a three-digit number (hundreds, tens and ones)	Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones).		
	Count in multiples of twos, fives and tens	Count in steps of 2, 3 and 5 from 0, and in tens from any given number, forward or backward.	Count from zero in multiples of 4, 8, 50 and 100.	Count in multiples of 6, 7, 9, 25 and 1000 from zero.	Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000	
	Given a number, identify one more and one less.			Find 1000 more or less than any given number		
	Identify and represent numbers using objects and pictorial representations, including the use of the number line, and use the language of: equal to, more than, less than (fewer), most, least.	Identify, represent, and estimate numbers using different representations, including the number line.	Identify, represent and estimate numbers using different representations	Identify, represent, and estimate numbers using different representations.		
Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;		Compare and order numbers from 0 up to 100, use < , > and = signs.	Compare and order numbers up to 1000.	Order and compare number beyond 1000.		
		Use place value and number facts to solve problems.	Solve number problems and practical problems involving these ideas.	Solve number and practical problems that involve all of the above and with increasingly large positive numbers.	Solve number problems and practical problems that involve all of the above.	Solve number and practical problems that involve all of the above
				Round any number to the nearest 10, 100 or 1000.	Round any number up to 1,000,000 to the nearest 10,100,1000, 10,000 and 100,000	Round any whole number to a required degree of accuracy
				Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value	Read Roman numerals to 1000 (M) and recognise years written in Roman numerals	
Number: Addition and Subtraction						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

	Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.					
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.	Represent and use number bonds and related subtraction facts within 20	Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100				
	Add and subtract one-digit and two-digit numbers to 20, including zero.	Add and subtract numbers using concrete objects, pictorial representations and mentally, including: a 2-digit number and ones; a 2-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 numbers mentally with increasingly larger numbers.	Perform mental calculations, including with mixed operations and large numbers.
	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9.	Solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities, and measures.				
		Solve problems with addition and subtraction applying their increasing knowledge of mental and written methods.	Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction.	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	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 in context, deciding which operations and methods to use and why.
		Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another number cannot.				
		Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.	Estimate the answer to a calculation and use inverse operations to check answers.	Estimate and use inverse operations to check answers to a calculation.	Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.	Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
			Add and subtract numbers with up to three digits, using formally written methods of columnar addition and subtraction.	Add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate.	Add and subtract whole numbers with more than 4 digits including using formal written methods (columnar addition and subtraction).	
Number: 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.	Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in context.	Solve problems, including missing number problems involving multiplication and division, including integer scaling problems and correspondence problems in which n objects are connected to m objects.	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, including scaling by simple fractions and problems involving simple rates.	

	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.	Recall and use multiplication and division facts for multiplication tables up to 12 x 12.		
	Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs.	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, using mental and progressing to formal written methods.	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	Multiply and divide numbers mentally drawing upon known facts.	Perform mental calculations, including with mixed operations and large numbers.
			Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.	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 multi-digit numbers up to 4-digits by a 2-digit whole number using a formal written method of long multiplication.
	Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.		Recognise and use factor pairs and commutativity in mental calculations.	Identify factors and multiples, including finding all factor pairs of a number, and common factors of two numbers.	Identify common factors, common multiples, and prime 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.	
				Recognise and use square numbers and cube numbers and the notation for squared (2) and cubed (3).	
				Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes.	
				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	Divide numbers up to 4 digits by a two-digit number using the formal written methods of short division where appropriate, interpreting remainders according to the context
					Divide numbers up to 4-digits by a 2-digit whole number using a formal written method of long division and interpret remainders as a whole number remainder, fraction or by rounding as appropriate for the context.
				Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.	

					Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
						Use knowledge of the order of operations to carry out calculations involving the four operations.
						Solve problems involving addition, subtraction, multiplication and division.
Number: Fractions (including decimals and percentages)						
	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 for 1/3 , 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity.	Recognise, find, and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	Recognise and write decimal equivalents to 1/4, 1/2 and 3/4	Read and write decimal numbers as fractions (e.g. 0.71 = 71/100).	
		Write simple fractions, e.g. 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 and object into ten equal parts and in dividing one-digit numbers or quantities by 10.	Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten.		
				Recognise and write decimal equivalents of any number of tenths or hundredths.	Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.	
				Find 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		
			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.	Recognise and show, using diagrams, families of common equivalent fractions.	Identify, name, and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.	Recall and use equivalences between simple fractions, decimals, and percentages, including in different contexts.
						Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.
			Add and subtract fractions with the same denominator within one whole e.g. 5/7 +1/7= 6/7.	Add and subtract fractions with the same denominator.	Add and subtract fractions with the same denominator and denominators that are multiples of the same number.	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.

	Compare and order unit fractions and fractions with the same denominators.		Compare and order fractions whose denominators are all multiples of the same number.	Compare and order fractions, including fractions > 1
		Compare numbers with the same number of decimal place (up to two decimal places)	Read, write, order and compare numbers with up to three decimal places.	Identify the value of each digit to three decimal places and multiply and divide numbers by 10,100 and 1000 where the answers are up to three decimal places
	Solve problems that involve all of the above.	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.	Solve problems involving number up to three decimal places.	Solve problems which require answers to be rounded to specified degrees of accuracy.
		Solve simple measure and money problems involving fractions and decimals to two decimal places.		
		Round decimals with one decimal place to the nearest whole number.	Round decimals with two decimal places to the nearest whole number and to one decimal place	
			Recognise mixed numbers and improper fractions, and convert from one form to another and write mathematical statements > 1 as a mixed number	
			Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.	Multiply simple pairs of proper fractions, writing the answer in its simplest form e.g. 1/4 x 1/2 = 1/8
				Divide proper fractions by whole numbers e.g. 1/3 ÷ 2 = 1/6
			Recognise the percent symbol (%) and understand that percent relates to the number of parts per hundred, write percentages as a fraction with the denominator hundred and as a decimal fraction.	
			Solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those with the denominator of digit 10 or 25.	Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8)
				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.
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.
					Solve problems involving the calculation of percentages, (e.g. of measures) 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 factors and multiples.
Algebra					
					Use simple formulae.
					Generate and describe linear number sequences
					Express missing number problems algebraically.
					Find pairs of numbers that satisfy equations involving two unknowns.
					Enumerate all possibilities of combinations of two variables.
Measurement					
	Compare, describe and solve practical problems for lengths and heights (e.g. long/short, longer/shorter, tall/short, double/half); mass or weight (e.g. heavy/light, heavier than/lighter than); capacity/volume (full/empty, more than, less than, quarter); time (quicker, slower, earlier, later).	Compare and order lengths, mass, volume/capacity and record the results using >, < and =.	Measure, compare, add and subtract lengths (mm/cm/m); mass (kg/g) ; volume/capacity (l/ml)	Estimate, compare and calculate different measures, including money in pounds and pence and length.	
	Measure and begin to record lengths/heights; mass/weight; capacity and volume; time (hours, minutes, seconds)	Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels.			
	Recognise and know the value of different denominations of coins and notes	Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value.			
		Find different combinations of coins that equal the same amounts of money.			
		Solve simple problems in a practical context involving addition and subtraction of	Add and subtract amounts of money to give change using both £ and p in practical contexts.		

		money of the same unit, including giving change.				
	Sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon, and evening.	Compare and sequence intervals of time.	Compare durations of events, for example to calculate the time taken by particular events or tasks.			
	Recognise and use language related to dates, including days of the week, weeks, months, and years.	Know the number of minutes in an hour and the number of hours in a day.	Know the number of seconds in a minute, days in each month, year and leap year.	Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	Solve problems involving converting between units of time	
	Tell the time to the hour and half past the hour and draw hands on a clock face to show these times.	Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on the clock face to show these times.	Estimate and read time within increased accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight.	Read, write and convert time between analogue and digital 12- and 24-hour clocks.		
			Tell and write the time from an analogue clock, including using roman numerals from I to XII, and 12-hour and 24-hour clocks.			
			Measure and compare the perimeter of simple 2-D shapes.	Measure and calculate the perimeter of a rectilinear figure (including squares) in cm and m	Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.	Recognise that shapes with the same area can have different perimeters and vice versa.
				Find the area of rectilinear shapes by counting squares.	Calculate and compare the area of rectangles, including squares, and including using standard units square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes.	Calculate the area of parallelograms and triangles.
					Estimate volume (e.g. using 1cm3 blocks to build cuboids (including cubes)) and capacity (e.g. using water).	Calculate, estimate and compare volume of cubes and cuboids using standard units including centimetre cubed (cm3) and cubic metres (m3) and extending to other units such as mm3 and km3.
						Recognise when it is possible to use formulae for area and volume of shapes.
				Convert between different units of measure (e.g. kilometres to metres, hours to minutes).	Convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre).	Use, read, write, and convert between standard units, converting measurements of length, mass, volume and time from smaller units of measure to larger units of measure and vice versa using decimal notation up to three decimal places.
					Understand and use approximate equivalences between metric units and	Convert between miles and kilometres.

					common imperial units such as inches, pounds and pints.	
					Use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling.	Solve problems involving the calculation and conversion units of measure, using decimal notation up to three decimal places where appropriate.
Geometry: Properties of shape						
	Recognise and name common 2D and 3D shapes, including 2D shapes (e.g. rectangles (including squares), circles and triangles).	Identify and describe properties of 2D shapes, including the number of sides and symmetry in a vertical line.	Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them.			Draw 2-D shapes using given dimensions and angles.
	Recognise and name common 2-D and 3-D shapes, including 3-D shapes (e.g. cuboids (including cubes), pyramids and spheres).	Identify and describe the properties of a 3-D shape, including the number of edges, vertices and faces.				Recognise, describe and build simple 3-D shapes, including making nets.
		Identify 2D shapes on the surface of 3D shapes, for example a circle on a cylinder and a triangle on a pyramid.			Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.	
		Compare and sort common 2-D and 3-D shapes and everyday objects.		Compare and classify geometric shapes, including quadrilaterals and triangles based on their properties and sizes.	Use the properties of rectangles to deduce related facts and find missing lengths and angles.	Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.
			Recognise angles as properties of shape or a direction of a turn.			
			Identify right angles, recognise 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.	Identify acute and obtuse angles and compare and order angles up to two right angles by size.	Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.	
					Draw given angles and measure them in degrees (o).	
					Identify angles at a point and one whole turn (360o); at a point on a straight line and half a turn (180o); other multiples of 90o	Recognise angles where they meet at a point, are on a straight line or are vertically opposite and find missing angles.
			Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.	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.		
					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.
Geometry: Position and direction						
	Describe position, directions, and movements, including half, quarter, and three-quarter turns.	Use mathematical vocabulary to describe position, direction, and movement, including movement in a straight line and distinguishing between rotational as a turn and in turns of right angles for quarter, half, and three-quarter turns (clockwise and anti-clockwise).		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 a translation, using the appropriate language and know that the shape has not changed.	Draw and translate simple shapes in the coordinate plane and reflect them in the axes.
		Order and arrange combinations of mathematical objects in patterns and sequences				
				Describe positions on a 2-D grid as co-ordinates in the first quadrant.		Describe positions on the full coordinate grid (all four quadrants).
				Plot specified points and draw sides to complete a given polygon.		
Statistics						
		Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.	Interpret and present data using bar charts, pictograms, and tables.	Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.	Complete, read and interpret information in tables, including timetables.	Interpret and construct pie charts and line graphs and use these to solve problems.
		Ask and answer simple questions by counting the number of objects in each category and sort the categories by quantity.	Solve one-step and two-step questions such as “How many more?” and “How many fewer?” using information presented in scaled bar charts, pictograms, and tables.	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.	
		Ask and answer questions about totalling and comparing categorical data.				
						Calculate and interpret the mean as an average.