Whole School Maths Long Term Plan – National Curriculum Objective

	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Number & Place Value	❋ count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward ❋ recognise the place value of each digit in a two-digit number (10s, 1s) ❋ identify, represent and estimate numbers using different representations, including the number line ❋ compare and order numbers from 0 up to 100; use <, > and = signs ❋ read and write numbers to at least 100 in numerals and in words ❋ use place value and number facts to solve problems	❋ count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number ❋ recognise the place value of each digit in a 3-digit number (100s, 10s, 1s) ❋ compare and order numbers up to 1,000 ❋ identify, represent and estimate numbers using different representations ❋ read and write numbers up to 1,000 in numerals and in words ❋ 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 ❋ round any whole number to a required degree of accuracy ❋ use negative numbers in context, and calculate intervals across 0 ❋ solve number and practical problems that involve all of the above	❋ understand and use place value for decimals, measures and integers of any size ❋ order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ ❋ use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property ❋ interpret and compare numbers in standard form A x 10n 1≤A<10, where n is a positive or negative integer or 0 ❋

Addition & Subtraction	❋ solve problems with 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
	❋ 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:
		❋ add and subtract numbers mentally, including:
		❋ a three-digit number and 1s
		❋ a three-digit number and 10s
		❋ a three-digit number and 100s
		❋ add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction
		❋ estimate the answer to a calculation and use inverse operations to check answers
		❋ solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction
			❋ add 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 problems in contexts, deciding which operations and methods to use and why
				❋ add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
				❋ 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
					❋ 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
					❋ perform mental calculations, including with mixed operations and large numbers
					❋ use their knowledge of the order of operations to carry out calculations involving the 4 operations
						❋ use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative
						❋ use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals
						❋ recognise and use relationships between operations including inverse operations
						❋ use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations

	- a two-digit number and 1s - a two-digit number and 10s 2 two-digit numbers - adding 3 one-digit numbers ❋ show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot ❋ recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems					
Multiplication & Division	❋ recall and use multiplication and division facts for the 2, 5 and 10 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	❋ recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables ❋ write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods ❋ 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	❋ recall multiplication and division facts for multiplication tables <u>up to 12 × 12</u> ❋ use place value, known and derived facts to multiply and divide mentally, including: <u>multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers</u> ❋ <u>recognise and use factor pairs and commutativity in mental calculations</u> ❋ <u>multiply two-digit and three-digit numbers by a one-digit number using formal written layout</u> ❋ 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	❋ 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 ❋ multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers ❋ multiply and divide numbers mentally, drawing upon known facts ❋ divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context ❋ multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000	❋ 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	❋ use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property ❋ use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative ❋ use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals ❋ recognise and use relationships between operations including inverse operations ❋ use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations

				❋ 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 ❋ 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	❋ 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 ❋ use their knowledge of the order of operations to carry out calculations involving the 4 operations ❋ identify common factors, common multiples and prime numbers	
Money	❋ 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 money of the same unit, including giving change	❋ add and subtract amounts of money to give change, using both £ and p in practical contexts	❋ estimate, compare and calculate different measures, including money in pounds and pence	❋ solve problems involving number up to 3 decimal places ❋ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	*Not taught in year 6 – although decimals unit of learning will tie in with this objective*	❋ use standard units of mass, length, time, money and other measures, including with decimal quantities
Time	❋ 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	❋ 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	❋ read, write and convert time between <u>analogue and digital</u> 12- and 24-hour clocks ❋ <u>solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days</u>	❋ solve problems involving converting between units of time	❋ 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	❋ change freely between related standard units [for example time, length, area, volume/capacity, mass]

		❋ compare durations of events [for example, to calculate the time taken by particular events or tasks]				
Mass & Capacity	❋ choose and use appropriate standard units to estimate and measure mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels ❋ compare and order mass, volume/capacity and record the results using >, < and =	❋ measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	❋ <u>convert</u> between different units of measure ❋ estimate, compare and calculate different measures	❋ 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 ❋ solve problems involving converting between units of time ❋	❋ change freely between related standard units [for example time, length, area, volume/capacity, mass]	❋ change freely between related standard units [for example time, length, area, volume/capacity, mass]
Length & Perimeter	❋ choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels ❋ compare and order lengths and record the results using >, < and =	❋ measure, compare, add and subtract: lengths (m/cm/mm) ❋ measure the perimeter of simple 2-D shapes	❋ <u>convert between different units of measure</u> [for example, kilometre to metre] ❋ measure and calculate the perimeter of a <u>rectilinear figure</u> (including squares) in centimetres and metres	❋ measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres ❋ convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]	❋ recognise that shapes with the same areas can have different perimeters and vice versa	❋ derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders) ❋ calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes
Area	*Not taught in year 2*	*Not taught in year 3*	❋ <u>find the area of rectilinear shapes by counting squares</u>	❋ calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm²) and square metres (m²), and estimate the area of irregular shapes	❋ 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	❋ derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders) ❋ calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes
Fractions	❋ recognise, find, name and write fractions 1/3 , 1/4 , 2/4 and 3/4 of a length, shape, set of objects or quantity ❋ write simple fractions, for example 1/2 of 6 = 3 and recognise the	❋ 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	❋ <u>recognise and show, using diagrams, families of common equivalent fractions</u> ❋ <u>solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities,</u>	❋ 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	❋ use common factors to simplify fractions; use common multiples to express fractions in the same denomination ❋ compare and order fractions, including fractions >1	❋ work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and or 0.375 and) ❋ define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using

	equivalence of 2/4 and 1/2	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 the same denominator within one whole [for example, + =] ⁂ compare and order unit fractions, and fractions with the same denominators ⁂ solve problems that involve all of the above	<u>including non-unit fractions where the answer is a whole number</u> ⁂ <u>add and subtract fractions with the same denominator</u> ⁂ <u>solve simple measure and money problems involving fractions and decimals to 2 decimal places</u>	⁂ 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, 2/5 + 4/5 = 6/5 = 1 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 ⁂ recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	⁂ 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, 1/4 × 1/2 = 1/8] ⁂ divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6] ⁂ associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8] ⁂ solve problems which require answers to be rounded to specified degrees of accuracy	percentages, and work with percentages greater than 100% ⁂ interpret fractions and percentages as operators
Properties of shape	⁂ 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	⁂ draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them ⁂ recognise angles as a property of shape or a description of a turn ⁂ identify right angles, recognise that 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle ⁂ identify horizontal and vertical lines and pairs of perpendicular and parallel lines	⁂ <u>compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes</u> ⁂ <u>identify acute and obtuse angles and compare and order angles up to 2 right angles by size</u> ⁂ <u>identify lines of symmetry in 2-D shapes presented in different orientations</u> ⁂ <u>complete a simple symmetric figure with respect to a specific line of symmetry</u>	⁂ 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	⁂ derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders) ⁂ calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes ⁂ draw and measure line segments and angles in geometric figures, including interpreting scale drawings ⁂ derive and use the standard ruler and compass ⁂ constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line ⁂ describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric ⁂ use the standard conventions for labelling the sides and angles of triangle ABC, and

						❋ know and use the criteria for congruence of triangles
						❋ derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies
						❋ identify properties of, and describe the results of, translations, rotations and reflections applied to given figures
						❋ identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids
						❋ apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles
						❋ understand and use the relationship between parallel lines and alternate and corresponding angles
						❋ derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons
						❋ apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, including Pythagoras' Theorem, and use known results to obtain simple proofs
						❋ use Pythagoras' Theorem and trigonometric ratios in similar triangles to solve problems involving right-angled triangles
						❋ use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D
						❋ interpret mathematical relationships both algebraically and geometrically
Statistics	❋ interpret and construct simple pictograms, tally charts, block diagrams and tables ❋ ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity ❋ ask-and-answer questions about totalling and comparing categorical data ❋	❋ interpret and present data using bar charts, pictograms and tables ❋ solve one-step and two-step questions [for example 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables	❋ <u>interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs</u> ❋ <u>solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs</u>	❋ 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	❋ describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers) ❋ construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data ❋ describe simple mathematical relationships between 2 variables

						(bivariate data) in observational and experimental contexts and illustrate using scatter graphs
Position and Direction	*Not taught in year 2*	*Not taught in year 3*	✳ 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	✳ describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric ✳ identify properties of, and describe the results of, translations, rotations and reflections applied to given figures ✳ identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids
Decimals	*Not taught in year 2*	✳ add and subtract amounts of money to give change, using both £ and p in practical contexts	✳ count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10 ✳ recognise and write decimal equivalents of any number of tenths or hundreds ✳ 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	✳ multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000 ✳ solve problems involving number up to 3 decimal places ✳ read and write decimal numbers as fractions [for example, 0.71 = 71/100] ✳ 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 ✳ 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 ✳ 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	✳ 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 ✳ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts ✳ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	✳ understand and use place value for decimals, measures and integers of any size ✳ order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ ✳ use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property ✳ use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative ✳ use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals ✳ recognise and use relationships between operations including inverse operations ✳ use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations ✳ interpret and compare numbers in standard form A x 10n 1≤A<10, where n is a positive or negative integer or 0 ✳ work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 7/2 or 0.375 and 3/8) ✳ define percentage as 'number of parts per hundred', interpret percentages and

	Year 2	Year 3	Year 4	Year 5	Year 6	
				❄ 1/2 , 1/4 , 1/5 , 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25 ❄ multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000 ❄ solve problems involving number up to 3 decimal places		percentage changes as a fraction or a decimal, ❄ interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using percentages, and work with percentages greater than 100% ❄ interpret fractions and percentages as operators ❄ use standard units of mass, length, time, money and other measures, including with decimal quantities ❄ round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures] ❄ use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation a<x≤b ❄ use a calculator and other technologies to calculate results accurately and then interpret them appropriately ❄ appreciate the infinite nature of the sets of integers, real and rational numbers ❄
Percentages	*Not taught in year 2*	*Not taught in year 3*	*Not taught in year 4*	❄ read and write decimal numbers as fractions [for example, 0.71 = 71/100] ❄ 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 1/2 , 1/4 , 1/5 , 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25 ❄ multiply and divide whole numbers and those involving	❄ 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 ❄ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts ❄ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	❄ define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, ❄ interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using percentages, and work with percentages greater than 100% ❄ interpret fractions and percentages as operators

				decimals by 10, 100 and 1,000		
Ratio	*Not taught in year 2*	*Not taught in year 3*	*Not taught in year 4*	*Not taught in year 5*	❋ 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	❋ use ratio notation, including reduction to simplest form ❋ divide a given quantity into 2 parts in a given part:part or part:whole ratio; express the division of a quantity into 2 parts as a ratio ❋ understand that a multiplicative relationship between 2 quantities can be expressed as a ratio or a fraction
Algebra	*Not taught in year 2*	*Not taught in year 3*	*Not taught in year 4*	*Not taught in year 5* *(However, children should be taught how to find unknown values etc. which links to 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	❋ use and interpret algebraic notation, including: ❋ ab in place of a × b ❋ 3y in place of y + y + y and 3 × y ❋ a^2 in place of a × a, a^3 in place of a × a × a; a^2b in place of a × a × b ❋ in place of a ÷ b ❋ coefficients written as fractions rather than as decimals ❋ Brackets ❋ substitute numerical values into formulae and expressions, including scientific formulae ❋ understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors ❋ simplify and manipulate algebraic expressions to maintain equivalence by: ❋ collecting like terms ❋ multiplying a single term over a bracket ❋ taking out common factors ❋ expanding products of 2 or more binomials ❋ understand and use standard mathematical formulae; rearrange formulae to change the subject ❋ model situations or procedures by translating them into algebraic expressions or formulae and by using graphs ❋ use algebraic methods to solve linear equations in 1 variable (including all forms that require rearrangement)

						❋ work with coordinates in all 4 quadrants ❋ recognise, sketch and produce graphs of linear and quadratic functions of 1 variable with appropriate scaling, using equations in x and y and the Cartesian plane ❋ interpret mathematical relationships both algebraically and graphically ❋ reduce a given linear equation in 2 variables to the standard form $y = mx + c$; calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically ❋ use linear and quadratic graphs to estimate values of y for given values of x and vice versa and to find approximate solutions of simultaneous linear equations ❋ find approximate solutions to contextual problems from given graphs of a variety of functions, including piece-wise linear, exponential and reciprocal graphs ❋ generate terms of a sequence from either a term-to-term or a position-to-term rule ❋ recognise arithmetic sequences and find the nth term ❋ recognise geometric sequences and appreciate other sequences that arise ❋