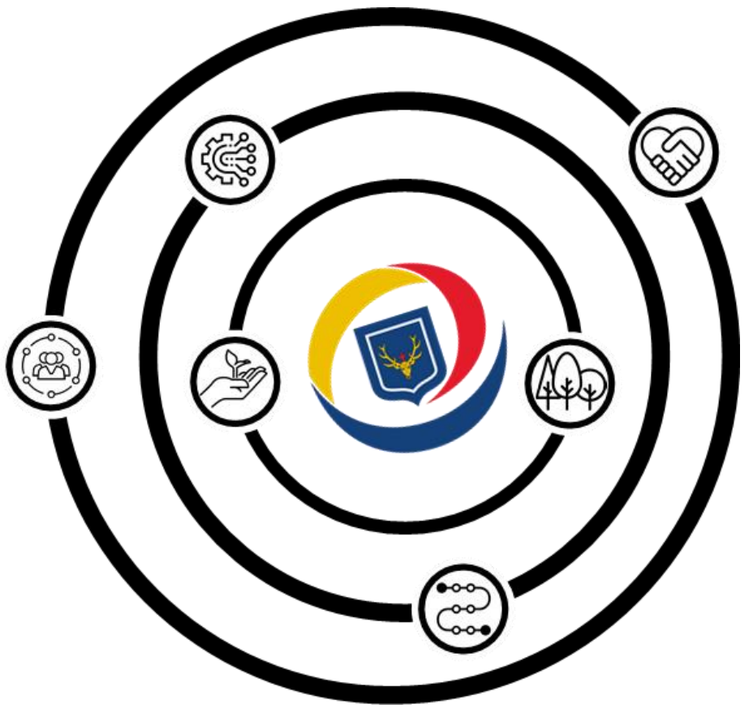
OUR LADY AND ST. HUBERT'S PRIMARY

Maths Knowledge Progression



At Our Lady and St. Hubert's, home, school and parish work together, knowing that God is with us in all we do.

OUR LADY AND ST HUBERT'S CATHOLIC PRIMARY SCHOOL

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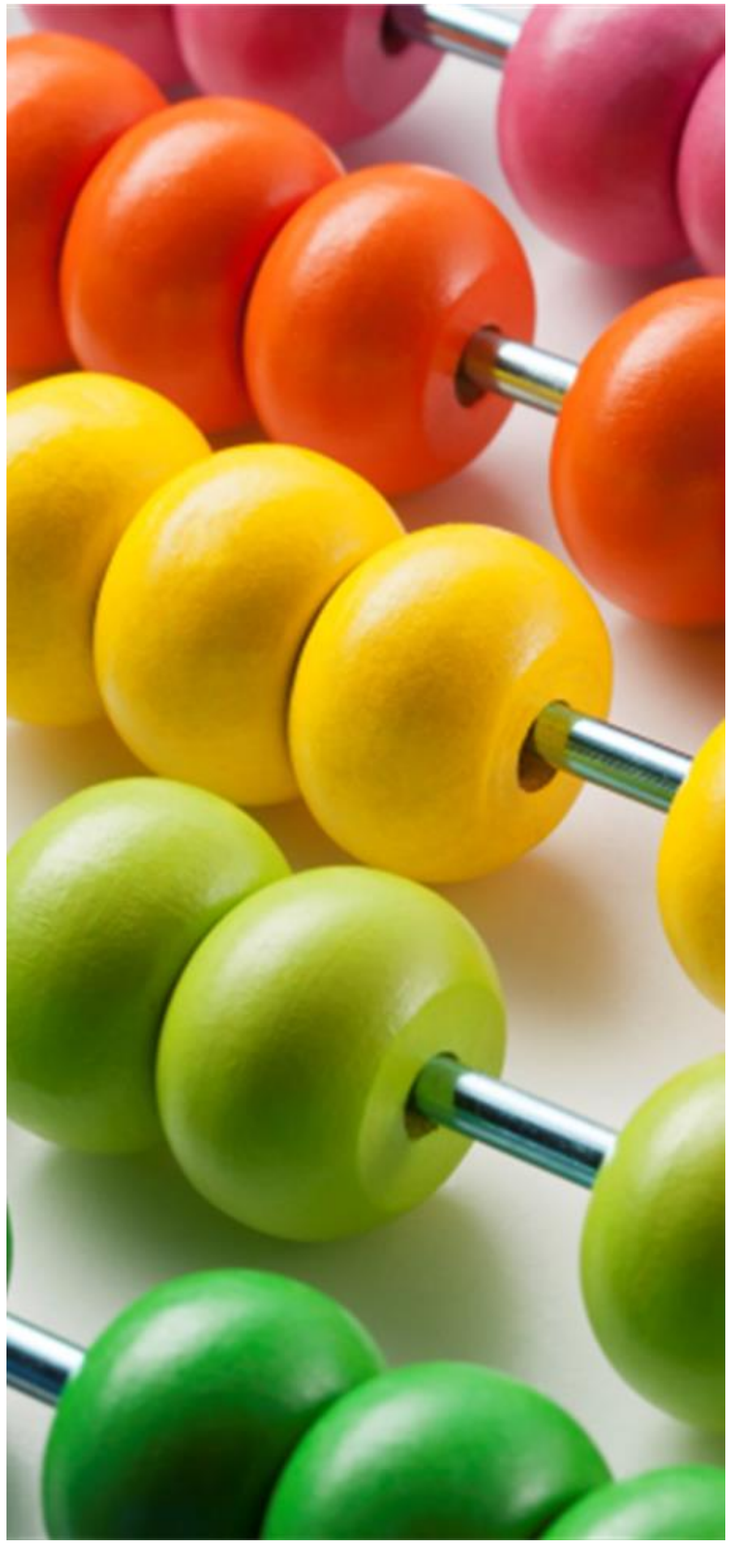

Number – Place Value

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number	count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward	count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number	count in multiples of 6, 7, 9, 25 and 1,000	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 up to 10,000,000 and determine the value of each digit
count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s	recognise the place value of each digit in a two-digit number (10s, 1s)	recognise the place value of each digit in a 3-digit number (100s, 10s, 1s)	find 1,000 more or less than a given number	count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000	round any whole number to a required degree of accuracy
given a number, identify 1 more and 1 less	identify, represent and estimate numbers using different representations, including the number line	compare and order numbers up to 1,000	count backwards through 0 to include negative numbers	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0	use negative numbers in context, and calculate intervals across 0
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), most, least	compare and order numbers from 0 up to 100; use and = signs	identify, represent and estimate numbers using different representations	recognise the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s)	round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000	solve number and practical problems that involve all of the above
read and write numbers from 1 to 20 in numerals and words	read and write numbers to at least 100 in numerals and in words	read and write numbers up to 1,000 in numerals and in words	order and compare numbers beyond 1,000	solve number problems and practical problems that involve all of the above	
	use place value and number facts to solve problems	solve number problems and practical problems involving these ideas	identify, represent and estimate numbers using different representations	read Roman numerals to 1,000 (M) and recognise years written in Roman numerals	
			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		

Number – Addition and Subtraction

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs	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	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 4 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)	perform mental calculations, including with mixed operations and large numbers
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 numbers with up to 3 digits, using formal written methods of columnar addition and subtraction	estimate and use inverse operations to check answers to a calculation	add and subtract numbers mentally with increasingly large numbers	use their knowledge of the order of operations to carry out calculations involving the 4 operations
add and subtract one-digit and two-digit numbers to 20, including 0	add and subtract numbers using concrete objects, pictorial representations, and mentally, including: -a two-digit number and 1s -a two-digit number and 10s -2 two-digit numbers -adding 3 one-digit numbers	estimate the answer to a calculation and use inverse operations to check answers	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	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 one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? − 9	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	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction		solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
					solve problems involving addition, subtraction, multiplication and division

Number – Multiplication and Division

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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	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 multiplication and division facts for multiplication tables up to 12 × 12	identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers	multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
	calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	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	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	know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	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
	show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot	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	recognise and use factor pairs and commutativity in mental calculations	establish whether a number up to 100 is prime and recall prime numbers up to 19	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
	solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts		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	identify common factors, common multiples and prime numbers
			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	multiply and divide numbers mentally, drawing upon known facts	perform mental calculations, including with mixed operations and large numbers
				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	use their knowledge of the order of operations to carry out calculations involving the 4 operations
				multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000	solve problems involving addition, subtraction, multiplication and division
				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	

Number – Fractions

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity	recognise, find, name and write fractions 1/3 , 1/4 , 2/4 and 3/4 of a length, shape, set of objects or quantity	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 and show, using diagrams, families of common equivalent fractions	compare and order fractions whose denominators are all multiples of the same number	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination
recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity	write simple fractions, for example 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2	recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	compare and order fractions, including fractions >1
		recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	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	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 different denominators and mixed numbers, using the concept of equivalent fractions
		recognise and show, using diagrams, equivalent fractions with small denominators	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	multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]
		add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$]	recognise and write decimal equivalents of any number of tenths or hundreds	multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]
		compare and order unit fractions, and fractions with the same denominators	recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$	read and write decimal numbers as fractions [for example, 0.71 = $\frac{71}{100}$]	associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]
		solve problems that involve all of the above	find the effect of dividing a one- or two-digit number by 10 and 100,	recognise and use thousandths and relate them to tenths,	identify the value of each digit in numbers given to 3 decimal

			identifying the value of the digits in the answer as ones, tenths and hundredths	hundredths and decimal equivalents	places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places
			round decimals with 1 decimal place to the nearest whole number	round decimals with 2 decimal places to the nearest whole number and to 1 decimal place	multiply one-digit numbers with up to 2 decimal places by whole numbers
			compare numbers with the same number of decimal places up to 2 decimal places	read, write, order and compare numbers with up to 3 decimal places	use written division methods in cases where the answer has up to 2 decimal places
			solve simple measure and money problems involving fractions and decimals to 2 decimal places	solve problems involving number up to 3 decimal places	solve problems which require answers to be rounded to specified degrees of accuracy
				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	recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
				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	

Measurement

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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 and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit	measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	convert 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 and kilogram; litre and millilitre]	solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate
measure and begin to record the following: -lengths and heights -mass/weight -capacity and volume -time (hours, minutes, seconds) -recognise and know the value of different denominations of coins and notes -sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]	compare and order lengths, mass, volume/capacity and record the results using >, < and =	measure the perimeter of simple 2-D shapes	measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints	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
recognise and use language relating to dates, including days of the week, weeks, months and years	recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value	add and subtract amounts of money to give change, using both £ and p in practical contexts	find the area of rectilinear shapes by counting squares	measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	convert between miles and kilometres

tell the time to the hour and half past the hour and draw the hands on a clock face to show these times	find different combinations of coins that equal the same amounts of money	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, compare and calculate different measures, including money in pounds and pence	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	recognise that shapes with the same areas can have different perimeters and vice versa
	solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change	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	read, write and convert time between analogue and digital 12- and 24-hour clocks	estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water]	recognise when it is possible to use formulae for area and volume of shapes
	compare and sequence intervals of time	know the number of seconds in a minute and the number of 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	calculate the area of parallelograms and triangles
	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	compare durations of events [for example, to calculate the time taken by particular events or tasks]		use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling	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]
	know the number of minutes in an hour and the number of hours in a day				

Geometry – Properties of Shapes

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
recognise and name common 2-D and 3-D shapes, including: -2-D shapes [for example, rectangles (including squares), circles and triangles] -3-D shapes [for example, cuboids (including cubes), pyramids and spheres]	identify and describe the properties of 2-D shapes, including the number of sides, and line 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	compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	identify 3-D shapes, including cubes and other cuboids, from 2-D representations	draw 2-D shapes using given dimensions and angles
	identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces	recognise angles as a property of shape or a description of a turn	identify acute and obtuse angles and compare and order angles up to 2 right angles by size	know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	recognise, describe and build simple 3-D shapes, including making nets
	identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]	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 lines of symmetry in 2-D shapes presented in different orientations	draw given angles, and measure them in degrees (°)	compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
	compare and sort common 2-D and 3-D shapes and everyday objects	identify horizontal and vertical lines and pairs of perpendicular and parallel lines	complete a simple symmetric figure with respect to a specific line of symmetry	dentify: 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	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

Geometry – Position and Direction

Year 1	Year 2	Year 3	Year 4	**Year 5**	**Year 6**
describe position, direction and movement, including whole, half, quarter and three-quarter turns	order and arrange combinations of mathematical objects in patterns and sequences		describe positions on a 2-D grid as coordinates in the first quadrant	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)
	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 movements between positions as translations of a given unit to the left/right and up/down		draw and translate simple shapes on the coordinate plane, and reflect them in the axes
			plot specified points and draw sides to complete a given polygon		

Statistics

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	interpret and construct simple pictograms, tally charts, block diagrams and 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	solve comparison, sum and difference problems using information presented in a line graph	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 sorting the categories by quantity	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	solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	complete, read and interpret information in tables, including timetables	calculate and interpret the mean as an average
	ask-and-answer questions about totalling and comparing categorical data				

Ratio and Proportion

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					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

Algebra

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					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