

Maths Progression Of Skills

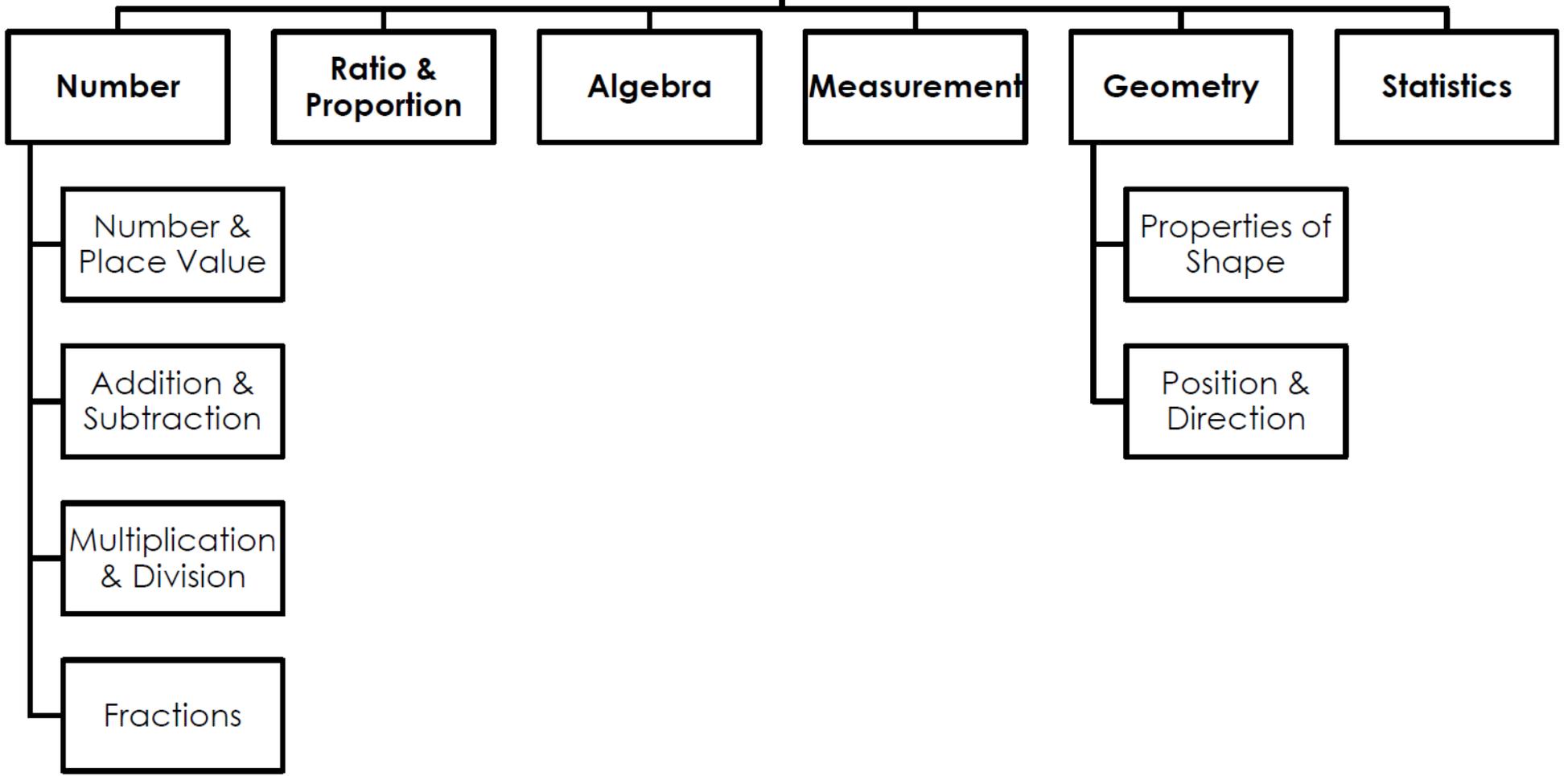
Progression in the National Curriculum

Introduction

The purpose of this document is to help teachers and school leaders quickly see progression in the National Curriculum (2014).

The content for mathematics is outlined by strand. This enables a quick view of the end of year expectations. These charts are useful for teachers when planning for differentiation and challenge.

Mathematics



Number

Ratio &
Proportion

Algebra

Measurement

Geometry

Statistics

Number &
Place Value

Addition &
Subtraction

Multiplication
& Division

Fractions

Properties of
Shape

Position &
Direction

Number, place value & rounding

Rec/ELG	Y1	Y2	Y3	Y4	Y5	Y6
Count reliably with numbers from 1 – 20.	Count to and across 100, forward & backwards, beginning with 0 or 1, or from any given number.			Count backwards through zero to include negative numbers.	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 zero.	Use negative numbers in context, & calculate intervals across zero.
	Count in multiples including 2s, 5s, and 10s.	Count in steps of 2, 3 & 5 from 0, and in tens from any number, forward & backward.	Count from 0 in multiples of 4, 8, 50 & 100.	Count in multiples of 6, 7, 9, 25 & 1000.		
Say which is 1 more or 1 less than a given number (to 10).	Given a number, identify 1 more and 1 less .		Find 10 or 100 more or less than a given number.	Find 1000 more or less than a given number.		
	Identify and represent numbers using concrete objects and pictorial representations including the number line, & use the language of: equal to, more than, less than (fewer), most, least.	Identify, represent & estimate numbers using different representations, incl the number line.	Identify, represent & estimate numbers using different representations.	Identify, represent & estimate numbers using different representations.		
	Read & write numbers to 100 in numerals. Read & write numbers from 1 – 20 in numerals & words	Read & write numbers to at least 100 in numerals and in words.	Read & write numbers to at least 1000 in numerals & in words.		Read, write, order & compare numbers to at least 1 000 000 & determine the value of each digit.	Read, write, order & compare numbers up to 10 000 000 & determine the value of each digit.
Order numbers 1 – 20.		Compare & order numbers from 0 up to 100; use <, > & = signs.	Compare & order numbers up to 1000.	Compare & order numbers beyond 1000.		
		Recognise the place value of each digit in a 2-digit number.	Recognise the place value of each digit in a 3-digit number.	Recognise the place value of each digit in a 4-digit number.	Read, write, order & compare numbers to at least 1 000 000 & determine the value of each digit.	
				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 & 100 000.	Round any whole number to a required degree of accuracy.
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.				Read Roman numerals to 100 (I to C) & understand that over time, the numeral system changed to include the concept of zero & place value.	Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	
		Use place value & number facts to solve problems .	Solve number problems & practical problems involving these ideas.	Solve number & practical problems that involve all of the above & with increasingly large positive numbers.	Solve number & practical problems that involve all of the above.	Solve number & practical problems that involve all of the above.

Addition and Subtraction

Rec/ELG	Y1	Y2	Y3	Y4	Y5	Y6
	Read, write & interpret mathematical statements involving + - = signs.					
	Represent and use number bonds & related subtraction facts within 20.	Recall & use addition & subtraction facts to 20 fluently, & derive & use related facts up to 100.				
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.	Solve one-step problems that involve addition & subtraction, using concrete objects & pictorial representations, & missing number problems,	Solve problems with addition & subtraction: <ul style="list-style-type: none"> - Using concrete objects & pictorial representations, incl those involving numbers, quantities & measures - Applying their increasing knowledge of mental & written methods 		Solve addition & subtraction two-step problems in contexts, deciding which operations & methods to use & why.	Solve addition & subtraction multi-step problems in contexts, deciding which operations & methods to use & why.	Solve addition & subtraction multi-step problems in contexts, deciding which operations & methods to use & why.
	Add & subtract 1-digit & 2-digit numbers to 20, including zero.	Add & subtract numbers using concrete objects, pictorial representations, & mentally, including: <ul style="list-style-type: none"> - 2-digit no & ones - 2-digit no & tens - Two 2-digit numbers - Adding three 1-digit numbers 	Add & subtract numbers mentally, including: <ul style="list-style-type: none"> - 3-digit no & ones - 3-digit no & tens - 3-digit no & hundreds 		Add & subtract numbers mentally with increasingly large numbers.	Perform mental calculations, incl with mixed operations & large numbers.
			Add & subtract numbers with up to 3 digits , using formal written methods of columnar addition & subtraction.	Add & subtract numbers with up to 4 digits using the formal written methods of columnar addition & subtraction where appropriate.	Add & subtract whole numbers with more than 4 digits including using formal written methods (columnar addition & subtraction).	Use knowledge of the order of operations to carry out calculations involving four operations .
		Show that addition of two numbers can be done in any order (commutative) & subtraction of one number from another cannot.				
		Recognise & use the inverse relationship between addition & subtraction & use this to check calculations & missing number problems.	Estimate the answer to a calculation & use the inverse operations to check answers.	Estimate & use inverse operations to check answers to a calculation.	Use rounding to check answers to calculations & determine, in the context of a problem, levels of accuracy.	Use estimation to check answers to calculations & determine, in the context of a problem, levels of accuracy.
			Solve problems , incl missing number problems, number facts, place value, & more complex addition & subtraction.			Solve problems involving addition, subtraction, multiplication & division.

Multiplication and division

Rec/ELG	Y1	Y2	Y3	Y4	Y5	Y6
		Recall & use multiplication & division facts for the 2, 5, 10 tables , incl recognising odd & even nos.	Recall & use the multiplication & division facts for the 3, 4, 8 tables .	Recall multiplication & division facts for tables up to 12x12	Identify all multiples & factors , including finding all factor pairs of a number, & common factors of two numbers.	Identify common factors, common multiples & prime numbers .
					Know & use the vocabulary of prime numbers, prime factors & composite (non-prime) numbers.	
					Establish where a number up to 100 is prime & recall prime numbers up to 19.	
		Calculate the mathematical statements for multiplication & division within the multiplication tables & write them using $\times \div =$ signs.				
		Show that multiplication of two numbers can be done in any order (commutative) & division of one number by another cannot.		Recognise & use factor pairs & commutativity in mental calculations.		
					Multiply & divide numbers mentally drawing upon known facts.	Perform mental calculations, incl mixed operations & large numbers.
			Write & calculate mathematical statements for multiplication & division using the multiplication tables that they know, incl 2-digit x 1-digit, using mental & progressing to formal written methods.	Multiply 2-digit & 3-digit numbers by a 1-digit number using formal written layout.	Multiply numbers up to 4-digits by a 1-digit or 2-digit number using a formal written method, including long multiplication for 2-digit numbers.	Multiply multi-digit numbers up to 4-digits by a 2-digit whole number using the formal written method of long multiplication .
					Divide numbers up to 4-digits by a 1-digit number using the formal written method of short division & interpret remainders appropriately for the context.	Divide numbers up to 4-digits by a 2-digit whole number using the formal written method of long division , & interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.
						Divide numbers up to 4-digits by a 2-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.

				Use place value, known & derived facts to multiply & divide mentally, including multiplying by 0 and 1; dividing by 1 ; multiplying three numbers together.	Multiply & divide whole numbers & those involving decimals by 10, 100 and 1000 .	
					Recognise & use square numbers & cube numbers , & the notation for squared ² and cubed ³ .	
Solve problems , including doubling, halving & sharing. ELG	Solve one-step problems involving multiplication & division, calculating the answer using concrete objects, pictorial representations & arrays with the support of the teacher.	Solve problems involving multiplication & division, using materials, arrays, repeated addition, mental methods, & multiplication & division facts, incl problems in context.	Solve problems , incl missing number problems, involving multiplication & division, incl integer scaling problems & correspondence problems in which n objects are connected to m objects.	Solve problems involving multiplying and adding, including the distributive law to multiply 2-digit numbers by 1-digit, integer scaling problems & harder multiplication problems such as n objects are connected to m objects.	Solve problems involving addition, subtractions, multiplication & division & a combination of these, incl understanding the meaning of the equals sign.	Use knowledge of the order of operations to carry out calculations involving four operations .
					Solve problems involving multiplication & division, including scaling by simple fractions & problems involving simple rates.	Solve problems involving addition, subtraction, multiplication & division.
					Solve problems involving multiplication & division including using their knowledge of factors & multiples, squares and cubes.	

Fractions, decimals and percentages

Rec/ELG	Y1	Y2	Y3	Y4	Y5	Y6
						Associate a fraction with division & calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$).
Solve problems, including doubling, halving & sharing. ELG	Recognise, find & name a half as one of two equal parts of an object, shape or quantity. Recognise, find & name a quarter as one of four equal parts of an object, shape or quantity.	Recognise, find, name & write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, and $\frac{3}{4}$ or a length, shape, set of objects or quantity.		Recognise & show, using diagrams, families of common equivalent fractions . Recognise & write decimal equivalents on any number of tenths or hundredths. Recognise & write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$.	Identify, name & write equivalent fractions of a given fraction, represented visually, incl tenths & hundredths. Read & write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$).	Identify the value of each digit to three decimal places and multiply & divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
				Find the effect of dividing a 1-digit or 2-digit number by 10 and 100, identifying the value of the digits in the answer as units, tenths and hundredths.		
		Write simple fractions , e.g. $\frac{1}{2}$ or $6 \div 3$ and recognise the equivalence of $\frac{2}{4}$ & $\frac{1}{2}$.	Count up & down in tenths; recognise that tenths arise from dividing an object into 10 equal parts & in dividing 1-digit numbers or quantities by 10.	Count up & down in hundredths; recognise that hundredths arise when dividing an object by a hundred & dividing tenths by ten.	Recognise & use thousandths & relate then to tenths, hundredths & decimal equivalents.	
					Recognise mixed numbers & improper fractions & convert from one form to the other & write mathematical statements.	
			Compare & order unit fractions, & fractions with the same denominators.		Compare & order fractions whose denominators are all multiples of the same number.	Compare & order fractions , including fractions >1 . Use common factors to simplify fractions; use common multiples to express fractions in the same denomination
			Recognise, find & write fractions or a discrete set of objects: unit fractions & non-unit fractions with small denominators			
			Recognise & use fractions as numbers: unit fractions & non-unit fractions with small denominators.			
			Recognise & show , using diagrams, equivalent fractions with small denominators.			

			Add & subtract fractions with the same denominator within one whole (e.g. $5/7+1/7=6/7$)	Add & subtract fractions with the same denominator.	Add & subtract fractions with the same denominator & multiples of the same number.	Add & subtract fractions with different denominators & mixed numbers, using the concept of equivalent fractions.
					Multiply proper fractions & mixed numbers by whole numbers, supported by materials & diagrams.	Multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $1/4 \times 1/2 = 1/8$)
						Multiply 1-digit numbers with up to two decimal places by whole numbers.
						Divide proper fractions by whole numbers (e.g. $1/3 \div 2 = 1/6$). Use written division methods in cases where the answer has up 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.	
				Compare numbers with the same number of decimal places up to two decimal places .	Read, write, order and compare numbers with up to three decimal places .	
					Recognise the per cent symbol (%) & understand that per cent relates to 'number or parts per hundred', and write percentages as a fraction with denominator hundred, and as a decimal fraction.	
						Recall & use equivalences between simple fractions, decimals & percentages, including in different contexts.
					Solve problems which require knowing percentage & decimal equivalents of $1/2$, $1/4$, $1/5$, $2/5$, $4/5$ and those with a denominator of a multiple of 10 or 25.	Solve problems involving the calculation of percentages of whole numbers or measures such as 15% of 360 and the use of percentages for comparison.*
			Solve problems that involve all of the above.	Solve problems involving increasingly harder fractions to calculate quantities, & fractions to divide quantities, including non-unit fractions where the answer is a whole number. Solve simple measure & money problems involving fractions & decimals to two decimal places.	Solve problems involving number up to three decimal places.	Solve problems which require answers to be rounded to specified degrees of accuracy.

* Extract from proportion section of NC



Ratio and proportion

Rec/ELG	Y1	Y2	Y3	Y4	Y5	Y6
						Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication & division facts.
						Solve problems involving the calculation of percentages of whole numbers or 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 & grouping using knowledge of fractions & multiples.

Algebra

Rec/ELG	Y1	Y2	Y3	Y4	Y5	Y6
						Express missing number problems algebraically.
						Use simple formulae
						Generate & describe linear number sequences.
						Find pairs of numbers that satisfy an equation with two unknowns.
						Enumerate all possibilities of combinations of two variables.

Measurement

Rec/ELG	Y1	Y2	Y3	Y4	Y5	Y6
<p>GENERAL</p> <p>Use everyday language to talk about size, weight, capacity, position, distance, time & money to compare quantities and objects and solve problems. ELG</p>	<p>Compare, describe & solve practical problems for:</p> <ul style="list-style-type: none"> - Lengths & heights - Mass/weight - Capacity & volume - Time <p>Measure & begin to record the following:</p> <ul style="list-style-type: none"> - Length & heights - Mass/weight - Capacity & volume - Time (hrs, mins, secs) 	<p>Choose and use appropriate standard units to estimate and measure:</p> <ul style="list-style-type: none"> - length/height in any direction (m/cm) - mass (kg/g) - temperature ($^{\circ}\text{C}$) - capacity (l/ml) <p>to the nearest appropriate unit, using rulers, scales, thermometers & measuring vessels.</p> <p>Compare & order lengths, mass, volume/capacity & record the results using $>$, $<$ and $=$.</p>	<p>Measure, compare, add & subtract:</p> <ul style="list-style-type: none"> - lengths (m/cm/mm) - mass (kg/g) - volume/capacity (l/ml) 	<p>Convert between different units of measure (e.g. km to m; hr to min)</p> <p>Estimate, compare & calculate different measures.</p>	<p>Convert between different units of metric measure (e.g. km/m; cm/m; cm/mm; g/kg; l/ml).</p> <p>Understand & use approximate equivalences between metric units & common imperial units such as inches, pounds & pints.</p> <p>Use all four operations to solve problems involving measure using decimal notation, including scaling.</p> <p>Estimate volume (e.g. using 1 cm^3 blocks to build cubes & cuboids) & capacity (e.g. using water).</p>	<p>Solve problems involving the calculation & conversion of units of measure, using decimal notation to three decimal places where appropriate.</p> <p>Use, read, write & convert between standard units, converting measurements of length, mass, volume & time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to three decimal places.</p> <p>Calculate, estimate & compare volume of cubes & cuboids using standard units, incl cm^3 and m^3, and extending to other units such as mm^3 and km^3.</p> <p>Convert between miles & km.</p> <p>Recognise when it is possible to use the formulae for area & volume of shapes.</p>
PERIMETER			Measure the perimeter of simple 2D shapes.	Measure & calculate the perimeter of a rectilinear figure (incl squares) in cm & m.	Measure & calculate the perimeter of composite rectilinear shapes in cm & m.	Recognise that shapes with the same areas can have different perimeters & vice versa.
AREA				Find the area of rectilinear shapes by counting squares.	Calculate & compare the area of rectangles (including squares, & including using standard units, square centimetres (cm^2) and square metres (m^2) & estimate the area of irregular shapes.	Calculate the area of parallelograms & triangles.

MONEY	<p>Recognise & know the value of different denominations or coins & notes.</p>	<p>Recognise & use symbols for pounds (£) and pence (p); combine amounts to make a particular value.</p> <p>Find different combinations of coins that equal the same amounts of money.</p> <p>Solve simple problems in a practical context involving addition & subtraction of money of the same unit, incl giving change.</p>	<p>Add & subtract amounts of money to give change, using both £ and p in practical contexts.</p>	<p>Estimate, compare & calculate different measures, including money in pounds & pence.</p>		
TIME	<p>Sequence events in chronological order using language (e.g. before, after, next, first, today, yesterday, tomorrow, morning, afternoon, evening).</p> <p>Recognise & use language relating to dates, incl days of the week, weeks, months, years.</p> <p>Tell the time to the hour & half past the hour & draw the hands on a clock face to show these times.</p>	<p>Compare & sequence intervals of time.</p> <p>Tell & write the time to five minutes, incl quarter past/to the hour & draw the hands on a clock face to show these times.</p>	<p>Tell & write the time from an analogue clock, incl using Roman numerals from I to XII, & 12-hour & 24-hour clocks.</p> <p>Estimate & read time with increasing accuracy to the nearest minute; record & compare time in terms of secs, mins, hrs; use vocabulary such as o'clock, am/pm, morning, afternoon, noon & midnight.</p> <p>Know the numbers of seconds in a minute & the number of days each month, year & leap year.</p> <p>Compare durations of events, for example to calculate time taken by particular events or tasks.</p>	<p>Read, write & convert time between analogue & digital 12- & 24-hour clocks.</p> <p>Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.</p>	<p>Solve problems involving converting between units of time.</p>	

Geometry: properties of shapes

Rec/ELG	Y1	Y2	Y3	Y4	Y5	Y6
Explore the characteristics of everyday objects and shapes and use mathematical language to describe them. ELG	<p>Recognise & name common 2D & 3D shapes, including:</p> <ul style="list-style-type: none"> - 2D, e.g. rectangles (including squares) circles, triangles - 3D, e.g. cuboids (including cubes), pyramids, spheres. 	<p>Identify & describe the properties of 2D shapes, incl the number of sides & symmetry in a vertical line.</p> <p>Identify & describe the properties of 3D shapes, incl the number of edges, vertices & faces.</p> <p>Identify 2D shapes on the surface of 3D shapes.</p> <p>Compare & sort common 2D & 3D shapes & everyday objects.</p>	<p>Draw 2D shapes & make 3D shapes using modelling materials; recognise 3D shapes in different orientations; & describe them.</p>	<p>Compare & classify geometric shapes, incl quadrilaterals and triangles, based on their properties & sizes.</p> <p>Identify lines of symmetry in 2D shapes presented in different orientations.</p> <p>Complete a simple symmetric figure with respect to a specific line of symmetry.</p>	<p>Identify 3D shapes, including cubes & cuboids, from 2D representations.</p> <p>Use the properties of rectangles to deduce related facts & find missing lengths & angles.</p> <p>Distinguish between regular & irregular polygons based on reasoning about equal sides & angles.</p>	<p>Draw 2D shapes using given dimensions & angles.</p> <p>Recognise, describe & build simple 3D shapes, incl making nets.</p> <p>Compare & classify geometric shapes based on their properties & sizes & find unknown angles in any triangles, quadrilaterals, & regular polygons.</p>
			<p>Recognise angles are a property of shape or a description of a turn.</p> <p>Identify right angles, recognise that two right angles make a half-turn, three make three quarters & four a complete turn; identify whether angles are greater than or less than a right angle.</p>	<p>Identify acute & obtuse angles & compare & order angles up to two right angles by size.</p>	<p>Know angles are measures in degrees; estimate & compare acute, obtuse & reflex angles.</p> <p>Identify:</p> <ul style="list-style-type: none"> - Angles at a point on a straight line & $\frac{1}{2}$ a turn (total 180°) - Angles at a point & one whole turn (total 360°) - Other multiples of 90° <p>Draw given angles, & measure them in degrees.</p>	<p>Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, & find missing angles.</p>
			<p>Identify horizontal and vertical lines and pairs of perpendicular & parallel lines.</p>			
						<p>Illustrate & name parts of circles, including radius, diameter & circumference & know that the diameter is twice the radius.</p>

Geometry: position, direction, motion

Rec/ELG	Y1	Y2	Y3	Y4	Y5	Y6
Recognise, create & describe patterns. ELG		Order & arrange combinations of mathematical objects in patterns and sequences.				
	Describe position, directions & movement , including half, quarter and three-quarter turns.	Use mathematical vocabulary to describe position, direction & movement , including movement in a straight line and distinguishing between rotation as a turn & in terms of right angles for quarter, half and three-quarter turns (clockwise & anti-clockwise).				
				Describe positions on a 2D grid as coordinates in the first quadrant .		Describe positions on the full coordinate grid (all four quadrants).
				Describe movements between positions as translations of a given unit to the left/right and up/down.	Identify, describe & represent the position of a shape following a reflection or translation , using the appropriate language, & know that the shape has not changed.	Draw & translate simple shapes on the coordinate plane, & reflect them in the axes.
				Plot specified points & draw sides to complete a given polygon.		

Statistics

Rec/ELG	Y1	Y2	Y3	Y4	Y5	Y6
		Interpret & construct simple: <ul style="list-style-type: none"> - pictograms - tally charts - block diagrams - simple tables 	Interpret & present data using: <ul style="list-style-type: none"> - bar charts - pictograms - tables 	Interpret & present discrete data using appropriate graphical methods, incl: <ul style="list-style-type: none"> - bar charts - time graphs 	Complete, read & interpret information in: <ul style="list-style-type: none"> - tables, incl timetables 	Interpret & construct: <ul style="list-style-type: none"> - pie charts - line graphs and use to solve problems.
		Ask & answer simple questions by counting the number of objects in each category & sorting the categories by quantity. Ask & answer questions about totalling and compare categorical data.	Solve one-step & two-step questions such as 'How many more?' and 'How many fewer?' using information presented in scaled bar charts & pictograms & tables.	Solve comparison, sum & difference problems using information presented in bar charts, pictograms, tables & other graphs.	Solve comparison, sum & difference problems using information presented in a line graph.	Calculate & interpret the mean as an average.