Chesham Bois CE School Maths Progression

Number and place value						
Rec/ELG	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
count reliably with numbers from 1-20 Build numbers beyond 10 using 10s and ones,	**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**	**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 through zero	use **negative numbers** in context, and calculate intervals across zero
count in **multiples** including 2s and 10s	count in **multiples** including 2s, 5s and 10s	count in **multiples** of 2, 3, and 5 from 0, and in tens from any number, forward or backward	count from 0 in **multiples** of 4, 8, 50 and 100	count in **multiples** of 6, 7, 9, 25 and 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 representations of numbers up to 5 through subitising. Explore and represent patterns up to 10 including evens and odds, double facts and how quantities can be distributed equally.	**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	**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		

	count, **read and write** numbers to 100 in numerals identify and **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 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 up to 10 000 000 and determine the **value** of each digit
order numbers 1-20		**compare and order** numbers from 0 up to 100; use <, > and = signs	**compare and order** numbers up to 1000	**compare and order** numbers beyond 1000		
		recognise the **place value** of each digit in a two-digit number (tens, ones)	recognise the **place value** of each digit in a three digit number (hundreds, tens, ones)	recognise the **place value** of each digit in a four digit number (thousands, hundreds, tens, and ones)		
				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 10 0000	**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	
		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

Addition and Subtraction

Rec/ELG	Y1	Y2	Y3	Y4	Y5	Y6
	read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs					
Number bonds to 5	**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				

	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 - applying their increasing knowledge of mental and written methods		**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 contexts, deciding which operations and methods to use and why
Add & subtract two single digit numbers **Count on or back** to find the answer	**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 two-digit number and ones - a two-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 large numbers	perform mental calculations, including with **mixed operations** and large numbers
			add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction	**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)	Use their knowledge of the order of operations to carry out calculations involving the **four operations**
		show that addition of two numbers can be done in any order **(commutative)** and subtraction of one number from another 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
			solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction			**solve problems** involving addition and subtraction

Multiplication and Division						
Rec/ELG	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
		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 two numbers	identify **common factors, common multiples and prime numbers**
					know and use the **vocabulary of prime numbers, prime factors and composite** (nonprime) numbers	
					establish whether a number up to 100 is prime and recall prime numbers up to 19	
		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 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		
					multiply and divide numbers mentally drawing upon known facts	perform mental calculations, including with mixed operations and large numbers
			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	**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 two-digit whole number using the formal written method of long multiplication
					divide numbers up to 4 digits by a one-digit number using the formal written method of short	**divide** numbers up to 4 digits by a two-digit whole number using the formal written method of long

					division and interpret remainders appropriately for the context	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
				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** whole numbers and those involving decimals by **10, 100 and 1000**	
					recognise and use **square numbers and cube numbers**, and the notation for squared and cubed **solve problems** involving multiplication and division including using their knowledge of **factors and multiples, squares and cubes**	
Solve problems, including doubling, halving and sharing	**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 contexts	**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	**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 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	use their knowledge of the order of operations to carry out calculations involving the **four operations** **solve problems** involving addition, subtraction, multiplication and division

Fractions, Decimals and Percentages						
Rec/ELG	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
						associate a fraction with division and calculate decimal fraction equivalents (for example, 0.375) for a simple fraction (for example 3/8)
Solve problems including **doubling, halving and sharing**	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** of a length, shape, set of objects or quantity ½, ¼, 2/4, ¾, 1/3 **write simple fractions** of numbers e.g. ½ of 6 = 3 **and recognise equivalence between** ½ and 2/4		recognise and show, using diagrams, families of common **equivalent fractions** recognise and write **decimal equivalents** of any number of tenths or hundredths recognise and write **decimal equivalents** to ½, ¼, ¾	identify, name and write **equivalent fractions** of a given fraction, represented visually, including tenths and hundredths **read and write decimal numbers** as fractions (for example, 0.71 = 71/100	identify the **value of each digit in numbers given to three decimal places** and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
				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		
			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	**count up and down** in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten	**recognise and use** thousandths and relate them to tenths, hundredths and decimal equivalents	
					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	

			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 use common factors to simplify fractions; use common multiples to express fractions in the same denomination
			recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators			
			recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators			
			recognise and show, using diagrams, equivalent fractions with small denominators			
			add and subtract fractions with the same denominator within one	**add and subtract** fractions with the same denominator	**add and subtract** fractions with the same denominator and denominators that are	**add and subtract** fractions with different denominators and mixed numbers, using the
			whole (for example, 5/7 + 1/7 = 6/7)		multiples of the same number	concept of equivalent fractions
					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 (for example, ½ x ¼ = 1/8)
						multiply one-digit numbers with up to two decimal places by whole numbers
						divide proper fractions by whole numbers (for example, 1/3 ÷ 2 = 1/6
				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 (%)** and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator 100, and as a decimal	recall and use equivalences between simple **fractions, decimals and percentages,** including in different contexts
					solve problems which require knowing **percentage and decimal equivalents** of ¼, ½, ¾ and those with a denominator of a multiple of 10 or 25	solve problems involving the **calculation of percentages** [for example, of 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, 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 problems and money problems involving fractions and decimals to two decimal places.		

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 and division facts
						solve problems involving the calculation of percentages [for example, 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 fractions and multiples

Algebra						
Rec/ELG	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
						express missing number problems algebraically
						use simple formulae
						generate and describe linear number sequences
						find pairs of numbers that satisfy an equation with two unknowns
						enumerate possibilities of combinations of two variables

Measurement						
Rec/ELG	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Use everyday language to talk about size, weight, capacity, position, distance, time & money to compare quantities & objects & solve problems	**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 [full/empty, more than, less than, half, half full, quarter] • time [quicker, slower, earlier, later] **measure and begin to record** the following: • lengths and 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 **compare and order** lengths, 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)	**convert between different units of measure** (for example, kilometre to metre; hour to minute) **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 use all four operations to **solve problems** involving measure [for example, length, mass, volume, money] using decimal notation including scaling **estimate volume** [for example, using 1 cm blocks to build cuboids (including cubes)] and capacity (for example, using water)	**solve problems** involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate **use, read, write and convert between standard units**, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places **calculate, estimate and compare volume** of cubes and cuboids using standard units, including centimetre cubed (cm) and cubic metres (m), and extending to other units [for example, mm and km] **convert** between miles and kilometres recognise when it is possible to use **formulae** for area and volume of shapes
			measure the **perimeter** of simple 2-D shapes	measure and calculate the **perimeter** of a rectilinear figure (including squares) in centimetres and metres	measure and calculate the **perimeter** of composite rectilinear shape s in centimetres and metres	recognise that shapes with the same areas 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) using standard units, square centimetres (cm) and square metres (m) and	calculate the **area** of parallelograms and triangles recognise when it is possible to use formulae for area and volume of shapes

					estimate the area of irregular shapes	
	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 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		
	sequence events in **chronological order** using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] recognise and use **language relating** to dates, including days of the week, weeks, months and years **tell the time to the hour and half past the hour** and draw the hands on a clock face to show these times	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, a.m./p.m., morning, afternoon, noon and midnight know the number of **seconds in a minute** and the number of days in each month, **year and leap year** **compare durations** of events [for example to calculate the time taken by particular events or tasks.	**read, write and convert** time between analogue and digital 12 and 24-hour clocks 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	

Geometry – properties of shape						
Rec/ELG	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Explore the characteristics of everyday objects and shapes and use mathematical language to describe them Recognise matching patterns and begin to consider symmetry.	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 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	**compare and classify** geometric shapes, including quadrilaterals and triangles, based on their properties and sizes identify lines of **symmetry** in 2-D shapes presented in different orientations complete a simple **symmetric figure** with respect to a specific line of symmetry	**identify 3-D shapes,** including cubes and other cuboids, from 2-D representations 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
			recognise **angles** as a property of shape or a description 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 **identify:** angles at a point and one whole turn (total 360) angles at a point on a straight line and ½ a turn (total 180) other multiples of 90 draw given **angles,** and measure them in	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			illustrate and name parts of **circles**, including radius, diameter and circumference and know that the diameter is twice the radius

Geometry – position and direction						
Rec/ELG	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Recognise, create and describe patterns		**order and arrange** combinations of mathematical objects in patterns and sequences				
Select, **rotate** and manipulate shapes	describe **position, direction and movement**, including whole, half, quarter and three-quarter turns	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 anticlockwise)				
				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 and represent the position of a shape following a **reflection** or **translation**, using the appropriate language, and know that the shape has not changed	**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						
Rec/ELG	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
		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 sorting the categories by quantity **ask and answer** questions about totalling and comparing categorical data	**solve one-step and twostep 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	**solve comparison, sum and difference problems** using information presented in a line graph	calculate and interpret the **mean** as an average