MATHS PROGRAMME OF STUDY FOR EACH YEAR GROUP

TO ENABLE DIFFERENTIATION & MEET THE NEEDS OF ALL PUPILS

Area/Strand of maths	Y1	Y2	Y3	Y4	Y5	Y6
NUMBER						
Place Value	**Reads & write from 1-20 in numerals & words**	**Reads & write to at least 100 in numerals & words**	**Reads & write to at least 1000 in numerals & words** Count on in 1s, 10s, 100s to become fluent in order & place value of numbers to 100	**Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)** - order and compare numbers beyond 1000	**Read, write, order & compare numbers to at least 1,000,000**	**Read, write, order & compare numbers to at least 10,000,000**
Counting	**Count, read, write to 100 in numerals**		**Identify, represent & estimate numbers using diff representations**	**Identify, represent & estimate numbers using diff representations**	**Count forwards or backwards in steps of powers of ten for any given number up to 1,000,000**	
Negative numbers				**Count backwards through zero to include negative numbers**	**Count forwards & backwards with positive & negative numbers through zero**	**Use negative numbers in context & calculate intervals across zero**
Tables	**Count in 2s, 5s, 10s**	**Count in 2s, 3s, 5s, 10s**	**Count from 0 in multiples of 4, 8, 50, 100**	**Count in multiples of 6, 7, 9, 25 and 1000**		
Place value	**1 more/less**	**Recognise the place value of the digits in a 2d number (tens, ones)**	**Recognise the place value of the digits in a 3d number (H T U)**	**Recognise the place value of each number in a 4d number (TH H T U)**	**Determine value of each digit in a 7 digit number**	**Recognise the value of each digit up to 10,000,000**

	Equal to, more than, less than, most, least	Compare & order number up to 100 using < > =	Compare & order number up to 1000 using < > =	Find 1000 more or less than a given number		
				Order & compare numbers beyond 1000		
Rounding				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 e.g. to 10, 20, 50,
X curricular links				Read Roman numerals to 100 (IN TOPIC)	Read Roman numerals to 1,000	
Problem Solving		Use place value & no facts to solve problems including missing numbers	Solve number & practical problems including missing numbers	Solve number & practical problems that involve all the above with including bigger numbers. Solve number sequences by finding the rule	Solve number & practical problems that involve all the above with including bigger numbers. Solve number sequences by finding the rule	Solve number & practical problems that involve all the above
Addition & Subtraction	Read, write, understand = + - signs	Recall addition & subtraction facts to 20 fluently	Estimate the answer to a calculation & use inverse to check	Estimate the answer to a calculation & use inverse to check	Estimate the answer to a calculation & use inverse to check	
	Memorise number bonds to 10 & 20 & subtraction facts	Derive & use related + and - facts up to 100			Use rounding to check answers &determine levels of accuracy when solving problems	
Calculations	Add/subtract 1d & 2d numbers to 20. U/stand the effect of adding zero	Add and subtract 3d & 1d number, 2d & 1d, 2d & 2d	Add & subtract number with up to 3d using formal written column addition & subtraction - becoming fluent	Add & subtract number with up to 4 digits including using formal written methods of	Add & subtract number with more than 4 digits including using formal written methods of	

				column addition & subtraction	column addition & subtraction	
	Combine & increase numbers counting forwards /backwards	Show that addition can be done in any order whereas - cannot				
		Recognise & use the inverse between + & -				
Problem Solving	Discuss & solve + & - 1 step practical problems including missing numbers problems – using maths vocab (total, add, altogether, take-away)	Solve + & - problems using mental/written methods (column method supports place value)	Solve problems with including large numbers (including missing numbers, using no facts, place value & more complex +/-) Using column methods	Solve 2 step addition/subtraction problems, deciding which operations & methods to use & why	Solve multi- step addition/subtraction problems, deciding which operations & methods to use & why	Solve addition/subtraction multi-step problems deciding which operations & methods to use & why
Mental Maths	Recall 2, 5, 10 x tables	Recall 2, 3, 5, 10 x tables	Recall 3, 4, 8 x tables Through doubling connect the 2, 4, 8 x tables	Recall 6, 7, 9 x tables ALL TABLES up to 12 x 12 & related division facts	Multiply & divide mentally drawing upon known facts	
			+ & - mentally: 3d and ones 3d and tens 3d and hundreds 2d + 2d can exceed 100	Continue to practise mental methods for + & - with increasingly large numbers	Add & subtract numbers mentally with increasingly large numbers e.g. 12,462 – 2300 = 10,162	Perform more complex mental calculations including with mixed operations & increasingly large numbers
			Develop efficient mental methods using	Use place value, known & derived facts to x & ÷		

			commutativity & associativity	mentally including multiplying together 3 numbers		
				Recognise & use factor pairs & commutativity in mental x & ÷ calculations		
Multiplication & Division **Tables**	**Count in 2s, 5s 10s using arrays, number patterns & make connections**	**Fluent in 2,5,10 x tables & make connections** **(to each other & 10 to place value, 5 to clock face)**	**Recall 3, 4, 8 x tables**	**Recall 6, 7, 9 x tables** **ALL TABLES up to 12 x 12 & related division facts**	**Multiply & divide mentally drawing upon known facts**	**Continue to use all the times tables to calculate mathematical statements in order to maintain their fluency**
Calculations **Multiplication**	**Begin to understand x and ÷ , doubling & simple fractions through grouping & sharing small quantities**	Relate x and ÷ to grouping & sharing discrete & continuous quantities & relate to fractions & measures (e.g. 40 ÷ 2 = 20, 20 is half of 40) **Use mathematical signs x ÷ =**	**Write & calculate mathematical statements for multiplication & division, using the x tables that they know, including 2d x 1d, progressing from mental maths to formal written methods** (develop effective formal written methods for short x & ÷)	**Multiply 2d & 3d numbers by a 1`d number using a formal written layout (short x & ÷ method)**	**Multiply numbers up to 4d x 1d/2d numbers using a formal written method**	**Multiply multi-digit numbers up to 4 digits by a 2d number using a formal written method**
		Show that multiplication can be done in any order whereas ÷ cannot		**Use place value, known & derived facts to x mentally including**	**Multiply whole & number with decimals by 10 & 100**	

				multiplying together 3 numbers		
Division				Use place value, known & derived facts to ÷ mentally	Divide numbers up to 4d by a 1d number, using a formal written method for short division & interpret remainders appropriately	Divide numbers up to 4d by a 2d number, using a formal written method for short division & interpret remainders as whole number, by rounding or as appropriately.
		Odd /even		Recognise & use factor pairs & commutativity in mental x & ÷ calculations	Multiples, factors, factor pairs, common factors of 2 numbers	
					Prime numbers, prime factors, composite numbers (non- prime numbers) Square/cube numbers	Identify common factors (= fractions), common multiples & prime numbers
Problem Solving	1 step practical problems	Solve problems involving x and ÷ using materials, arrays, repeated addition, mental methods, x and ÷ facts	Solve problems, including missing number, integer scaling problems & correspondence problems	Solve 2 step problems involving multiplying & adding using including harder numbers- including 2d x 1d, integer scaling problems & harder correspondence problems	Solve problems involving x and ÷ involving all the above Solve problems involving a combination of the 4 rules (+ - x ÷) Solve problems involving x and ÷ involving simple ratio	Use estimation to check answers to calculations & to determine a degree of accuracy Solve problems involving the 4 rules Use knowledge of the order of operations to carry out calculations

						involving the 4 operations (including brackets)
Fractions **Recognise, find, name**	Recognise, find & name a half Recognise, find & name a quarter	Recognise, find, name, write 1/3 ¼ 2/4 3/4	Recognise , find & write fractions of a discreet set of objects Unit fractions (numerator of one, 1/3) & non-unit fractions (numerator of >1, 3/5) with small denominators			
Add/Subtract		Calculate simple fractions eg ½ of 6 + 3	Add & subtract fractions (same denominator , the answer < 1)	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 fractions
Multiply					Multiply proper fractions & mixed numbers by whole numbers	Multiply simple pairs of proper fractions, answer in simplest form ¼ x ½ = 1/8
Equivalent		Simple equivalent fractions eg 2/4 = 1/2	Equivalent fractions with small denominators	Recognise/show families of equivalent fractions	Identify, name & write equivalent fractions (including 10ths & 100ths)	
Compare/order			Compare & order fractions (same denominator)		Compare & order fractions whose denominators are all	Compare & order fractions, including fractions > 1

					multiples of the same number	
					Recognise mixed numbers & improper fractions & convert from one to another	
Decimals **Place Value**			**Count up/down in tenths & U/stand what a tenth means**	**Count up & down in hundredths & U/stand what a hundredth means**	**Recognise & use thousandths & relate to /10ths & /100ths**	**Identify the value of each digit in given numbers to 3dp**
Rounding				**Round decimals with 1dp to the nearest whole number**	**Round decimals with 2dp to the nearest whole number & 1dp**	Rounding technique used to estimate & check reasonableness of answer
Compare/order				**Read, write , order & compare numbers with 2dp**	**Read, write , order & compare numbers with 3dp**	
Multiply						**Multiply 1d numbers with up to 2dp by whole numbers** **Use written division methods where the answer has up to 3 dp**
Divide						**Divide proper fractions by whole numbers** **1/3 ÷ 2 = 1/6**
				Divide a 1d & 2d number by 10 & 100 & note the effect		**Multiply & divide numbers by 10, 100, 1000 giving answers up to 3dp**

Dec/Frac equivalents				**Recognise & write decimal equivalents of any number of tenths or hundredths**		
				Recognise & write decimal equivalents to ¼, ½. ¾		**Associate a fraction with division** **Calculate decimal fraction equivalents e.g. 3/8 = 0.375**
Percentages					**Recognise & understand the % symbol as being 'number of parts per hundred'**	
					Read & write percentages as fractions e.g. 71% = 71/100	
					Write simple percentages as a decimal 0.4 = 40%	**Recall & use equivalences between simple fractions, decimals, %**
Problem Solving			**Solve problems based on above criteria**	**Solve problems involving including harder fractions to calculate quantities**	**Solve problems involving numbers with up to 3 dp**	**Solve problems which require answers to be rounded to specified degrees of accuracy**
				Solve simple measure & money problems involving fractions & decimals to 2dp	**Solve problems which require knowing:** • **% and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5** • **fractions with a denominator of a multiple of 10 or 25**	

RATIO & PROPORTION						
						Solve problems involving: Simple ratio (recipes) (e.g. 15% of 360) Similar shapes where scale factor known Unequal quantities (3/5 of class are boys)
ALGEBRA						
						Use simple formulae (symbols & letters to represent variables)
						Generate & describe linear number sequences
						Express missing number problems algebraically
						Find pairs of numbers that satisfy an equation with 2 unknowns
						Enumerate all possibilities of combinations of 2 variables
MEASUREMENT						

Time (see units of measure) Knowledge	Language of time re days of the week, week, months & years	Compare & sequence intervals of time	Use vocabulary such as am/pm, morning/afternoon, noon & midnight			
	Language to sequence events (today, yesterday, tomorrow)	Know 60 mins in 1 hr, 24 hrs in 1 day	Know 60 seconds in a minute, the number of days in a month & in a year/leap year			
Telling the time	Identify & draw hands to show o'clock & half past	Tell the time to 5 mins including ¼ past, ¼ to Become fluent in telling time on an analogue clock & recording it	Estimate & read time with increasing accuracy to the nearest minute			
			Tell & write time from an analogue/digital/24hr clock	Read, write & convert time between analogue & digital & 24hr clocks		
Problem solving				Solve problems converting from hours to minutes, minutes to seconds, years to months, weeks to days	Solve problems involving converting between units of time	
Money Knowledge	Know the value of different coins & notes. Become fluent in counting & Recognise coins & record	Recognise & use symbols for £ p; add amounts to make a particular value				

	pounds/pence separately Read & say amounts of money confidently					
		Different combinations of coins that make the same amount of money				
Problem solving/calculations		**Simple + - money problems, including change**	**Add & subtract amounts of money to give change, using £ and p, in practical contexts**	**Estimate, compare & calculate different measures, including money in pounds & pence**		
Units of Measure						
Measure/record	**Measure & record** **length, weight, capacity, time using non-standard & standard units**	**Choose appropriate units to estimate & measure length, weight, capacity, temperature using rulers, scales etc** **Use appropriate maths language & record using standard abbreviations**	**Measure, compare, add & subtract: lengths (mm, cm, m) mass (g, kg) capacity (mls, l)**			
Compare/order		**Compare & order length, weight, capacity using < > =**				
Conversions				**Convert between different units of measure (e.g. km to m)**	**Understand & use equivalences between metric units & imperial**	**Convert between miles & kilometres**

					units (pint, inches, pounds/ounces)	
					Convert between different units of metric measure (e.g. km & m, cm & m, am & mm, l & ml)	Use, read & convert between standard units, converting measurements of length, mass, volume & time from a smaller unit of measure to a larger unit, & vice versa (using decimal notation up to 3dp)
Perimeter			Measure the perimeter of simple 2D shapes	Measure & calculate the perimeter of a rectilinear figure in cm and m	Calculate the perimeter of composite rectilinear shapes in cm and m	Recognise that shapes with the same area can have different perimeters & vice versa
Area				Find the area of rectilinear shapes by counting squares	Calculate the area of rectangles in cm² and m² & estimate the area of irregular shapes	Recognise when to use formulae for area & volume of shapes
						Calculate the area of parallelograms & triangles
Volume					Estimate volume (using 1cm³ cubes) & capacity (using water)	Calculate, estimate & compare the volume of cubes & cuboids using standard units mm³, cm³, m³, km³
Problem solving	Solve problems relating to measurement				Use all 4 operations to solve problems involving measure using decimal notation including scaling	Solve problems involving the calculation & conversions of units of measure - using decimal notation up to 3dp

GEOMETRY						
Properties of shape **2D Shapes**	Handle, Recognise & name 2D shapes (circle, square), naming them fluently	Identify & describe properties of a 2D shapes (sides, symmetry)	Draw 2D shapes (according to properties)		Considering properties such as equal sides & angles – distinguish between regular & irregular polygons	Draw 2D shapes (considering properties) using given dimensions & angles Draw lines accurate to within 2mm
3D	Recognise & name 3D shapes (cube, cuboid, cylinder, triangular based pyramid)	Identify & describe properties of 3D shapes (edges, vertices, faces) Handle & name a wider range of 2D/3D shapes (quadrilaterals, prisms, cones)	Make 3D shapes, Recognise 3D shapes in different orientations		Identify 3D shapes, including cubes and other cuboids, from 2D representations	Recognise, describe & build 3D shapes, including making nets
		Identify 2D shapes within 3D shapes (circle on a cylinder face)				
Other properties			Identify horizontal & vertical lines & pairs of perpendicular & parallel lines			
Compare & Sort Shapes		Compare & sort common 2D/3D shapes		Compare & classify 2D shapes including quadrilaterals & triangles (isosceles, scalene, equilateral)		Compare & classify geometric shapes based on their properties & sizes
Angles			Recognise angles as the properties of a shape & a description of a turn	Identify acute & obtuse angles & compare & order up to 180°	Know angles are measured in degrees	

					Estimate & compare acute, obtuse & reflex angles	
			Identify & investigate right angles (1 = ¼ turn, 2 = ½ turn etc.) Identify if < or > a right angle		Identify a full turn (360°) straight angle (180°) a right angle & a ¾ angle (270°)	
					Measure angles using a protractor (accurate within 2 degrees either side)	
Missing angles					Find missing angles without using a protractor	Recognise angles where they meet at a point, are on a straight line or are vertically opposite, & find missing angles
						Find unknown angles in any triangles, quadrilaterals & regular polygons
Symmetry				Identify lines of symmetry in 2D shapes presented in different orientations		
				Complete a simple symmetrical figure with diff orientations of lines of symmetry	Recognise & use reflection in a variety of diagrams, including using within a grid	
					Identify, describe & represent the position	

					of a shape, following a reflection, using appropriate language & u/standing that the shape has not changed	
Circles (KS3)						Illustrate & name parts of circles, including radius, diameter & circumference & know that the diameter is twice the radius
Position & Direction	Use maths vocab such as left, right, middle, bottom, on top of, in front of, above, between, near etc	Order & arrange maths objects in patterns/sequences				
Turns/co-ordinates	Make half, quarter, three quarter turns in both directions Connect turning clockwise with a movement on a clock face	Turn, right angle, ¼, ½, ¾ turn, clockwise, anti-clockwise		Describe positions on a 2D grid as co-ordinates in the first quadrant (read, write, use co-ordinates)		Identify & plot co-ordinates on all 4 quadrants
				Plot specific points & draw sides to complete a given polygon		
Translations				Simple translations (left/right, up/down)	Recognise & use translation in a variety of diagrams, including using co-ordinates in the first quadrant	Draw & translate simple shapes on the co-ordinate plane & reflect them in the axes

| | | | | | Identify, describe & represent the position of a shape, following a translation, using appropriate language |& u/standing that the shape has not changed | |

STATISTICS

Interpret graphs/charts		Interpret/construct simple pictograms, tally charts, block diagrams Use simple 1, 2, 5, 10 ratios	Interpret/present data using bar charts, pictograms, tables	Interpret/present discrete & continuous data using bar charts, time graphs	Read, interpret & complete information in tables, including timetables	Interpret & construct pie charts & line graphs & use these to solve problems
						Calculate & interpret the mean as an average
Scales			Pupils understand simple scales e.g. 2, 5, 10 units per cm	Understand & use a greater range of scales	Solve sum, difference & comparison problems using info in a line graph (estimate using scales given)	
Problem Solving		Ask & answer questions about totalling/ comparing data	Solve one & two step problems. E.g. How many more? How many fewer?	Solve comparison, sum & difference problems using info presented in bar charts, pictograms, tables & other graphs		
		Ask & answer simple qns by counting/sorting				