

Maths Policy

Whitefriars School



Approved by: SLT
Effective from: September 2022
Review date: September 2022
Next Review Date: July 2023

Intent



Article 29: *Your right to become the best that you can be.*

The pupils will extend, deepen and reach their highest potential in the understanding and use of mathematical skills. They will be taught to be confident, successful and proficient mathematicians who can apply their Maths to other contexts and situations.

The pupils will be supported to become fluent in mathematical understanding from the most basic level so that they can build upon their own understanding. This will enable them to develop the recall of number facts and patterns and apply their knowledge rapidly and accurately.

The pupils will become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. They will reason mathematically by following a line of enquiry, conjecturing relationships, and generalisations. Pupils develop an argument, justification or proof using mathematical language.

The pupils will solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Implementation



Article 28: *Your right to learn and go to school.*

Skill development



Article 3: *Everyone who works with children should always do what is best for each child.*

A through-school approach is adopted for the learning and reinforcing of Mathematical skills. The school uses the White Rose Maths mastery curriculum. The mastery approach allows pupils to develop a more deepened understanding in the concepts being taught. The skills taught systematically and sequentially develop across the whole through-school. Each year group develops the skills taught previously and secondary section teaching builds seamlessly on that taught in the primary section.

Each new unit is taught through the CPA (concrete, pictorial, abstract) approach. The CPA approach builds on children's existing knowledge by introducing abstract concepts in a concrete and tangible way. When learning new skills, pupils are introduced to the topic using physical and visual aids to build understanding of abstract concepts. This helps bring maths to life. As they progress in understanding of the skill, pupils are encouraged to use pictorial representations alongside the abstract which enables them to make a meaningful link to more abstract mathematical thinking.

Concepts are introduced and taught in small steps; development is one step at a time. This allows pupils to fully consolidate what is being learnt and the embedding in long term memory.

While pupils are securing a skill, they are taught and encouraged to use and apply their understanding in a range of contexts. Using and applying maths is taught through problem solving, deepening knowledge, and seeing similar problem represented in various ways. This approach provides a platform for everything pupils will encounter as they move through education and beyond. Maths skills are used and reinforced in other curriculum areas.

Our curriculum fully embraces and meets all the requirements of the National Curriculum and the Statutory framework for the early years and foundation stage, and enhances this according to the needs of our pupils.

Content

The programme of study includes the following areas of the curriculum and pupils develop their skills in each area across all year groups.

- Number-Place Value
- Number-Addition, Subtraction, Multiplication, Division
- Number-Fractions, Percentages, Decimals
- Ratio and proportion
- Algebra
- Measurement
- Geometry-Properties of shapes, Position and direction
- Statistics

In Year 7 there is a particular focus on algebra and ratio. In Year 8 pupils study angles and statistics in greater detail. Year 9 places a greater emphasis on percentages and geometry.

Timetable

EYFS pupils have whole class teaching small focus group activities throughout the week. Pupils in Key Stages 1 and 2 are taught maths daily. Pupils have four timetabled lessons a week in Years 7, 8 and 9. All pupils study Maths at KS4 and take a GCSE in the subject. Pupils have five periods a week in Years 10 and 11. Pupils have the option of studying Maths for one of their A-levels and these pupils have five lessons per week in Years 12 and 13.

EYFS

In EYFS, pupils begin to learn mathematical concepts through whole class adult led teaching and small focus group activities where adults model mathematical language. The classroom setting allows for child-initiated learning and enables children to practice their mathematical skills (counting and number recognition) more independently. Pupils learn how to apply what they know by, for example, adding or subtracting numbers using concrete resources. Pupils begin to build an understanding of weighing, measuring and capacity through organised play activities, and the concept of time by using specific mathematical vocabulary.

GCSE and A-Level Maths

In KS4 pupils follow the Pearson Edexcel GCSE specification. The focus moves towards being able to effectively apply content learnt previously to problem solving questions.

In KS5, A level students also follow Pearson Edexcel and study Mathematics in greater detail. They are introduced to more advanced topics such as calculus, logarithms, and Standard deviation. The course is made up of Pure Mathematics (66%) and the final third is split equally between Mechanics and Statistics. This allows pupils to have a greater scope of Mathematics and is a great steppingstone for Maths related university courses.

Implementation - Skills

	Number				Ratio & Proportion	Algebra	Measurement	Geometry	Statistics
	Place Value	Addition & Subtraction	Multiplication & Division	Fractions Decimals Percentages					
EYFS	-recognise and count reliably with numbers 1-20 and place them in order -count objects reliably -say which number is one more or less than a given number -records using marks that they can interpret and explain	-using quantities and objects children add and subtract two single digit numbers and count on or back to find the answer -begin to use the vocabulary involved in addition and subtraction -identify own mathematical problems based on own interests and fascinations	-solve problems involving doubling halving and sharing	-identify half and a quarter using concrete objects			-use everyday language to talk about size, weight, capacity, distance, time and money -compare objects and quantities and solve problems -order two or three items by length, weight, height and capacity -order and sequence three events within a day	-recognise, create and describe patterns -explore the characteristics of everyday objects and shapes 2-D/3-D and use mathematical language to describe them -use everyday language to talk about position and direction	
Year 1	-count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number -count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens -given a number, identify one more and one less -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 -read and write numbers from 1 to 20 in numerals and words.-	-read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs -represent and use number bonds and related subtraction facts within 20 -add and subtract one-digit and two-digit numbers to 20, including zero -solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$.	-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.	-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		- solve missing number problems such as $7 = ? - 9$ without introducing algebraic notation	-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] -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] -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.	-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] - describe position, direction and movement, including whole, half, quarter and three-quarter turns	
Year 2	-count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward -recognise the place value of each digit in a two-digit number (tens, ones) -identify, represent and estimate numbers using different representations, including the number line -compare and order numbers from 0 up to 100; use <, > and = signs -read and write numbers to at least 100 in numerals and in words -use place value and number facts to solve problems.	-solve problems with addition and subtraction using concrete objects and pictorial representations -apply their increasing knowledge of mental and written methods -recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 -add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a 2-digit number and ones; a 2-digit number and tens; two 2-digit numbers; add three one-digit numbers -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 solve missing number problems.	-recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers -calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), 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 -solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	-recognise, find, name and write fractions, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity -write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of two quarters and one half.		-recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems	-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 = -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 -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.	-identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line -identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces -identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] -compare and sort common 2-D and 3-D shapes and everyday objects -order and arrange combinations of mathematical objects in patterns and sequences -use mathematical vocabulary to describe position, direction and movement	-interpret and construct simple pictograms, tally charts, block diagrams and simple tables -sorting categories by quantity -total and compare data
Years 3&4	-count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number -recognise the place value of each digit in a 3-digit number (hundreds, tens, ones) -compare and order numbers up to 1000 -identify, represent and estimate numbers using different representations -read and write numbers up to 1000 in numerals and in words -solve number problems and practical problems involving these ideas.	add and subtract numbers mentally, including: a 3-digit number and a 1-digit number; a 3-digit number and a 2-digit number; a 3-digit number and a 3-digit number -use formal written methods of column addition and subtraction -estimate the answer to a calculation and use inverse operations to check answers -solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	-recall and use multiplication and division facts for the 3, 4, 6, 7, 8, 9, 11, 12 multiplication tables -write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for 2-digit numbers times 1-digit numbers, using mental and progressing to formal written methods -solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	-count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 -recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators -recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators -recognise and show, using diagrams, equivalent fractions with small denominators -add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$] -compare and order unit fractions with the same denominator -solve problems that involve all of the above. -round decimals with one decimal place to the nearest whole number (year 4) -compare numbers with the same number decimal places, up to 2 decimal places (year 4) -Divide a one 1 or 2-digit number by 10 and 100 (year 4)		-solve missing number problems	-measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) -measure the perimeter of simple 2-D shapes -add and subtract amounts of money to give change, using both £ and p in practical contexts -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].	-draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them -recognise angles as a property of shape or a description of a turn -identify right angles, recognise that 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 horizontal and vertical lines and pairs of perpendicular and parallel lines 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	-interpret and present data using pictograms, bar charts and tables -solve comparison, sum and difference problems using information presented in bar charts, pictograms and tables
Years 5&6	-add and subtract numbers mentally with increasingly large numbers -add and subtract whole numbers with more than 4 digits, including using formal written methods (column addition and subtraction) -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 -perform mental calculations, including with mixed operations and large numbers -use their knowledge of the order of operations to carry out calculations involving addition and subtraction -use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy -solve addition, subtraction, multi-step problems in contexts, deciding which operations and methods to use and why	-count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 -multiply and divide numbers mentally drawing upon known facts -multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 -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 -divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division -interpret remainders as whole number remainders, fractions, or by rounding -identify common factors, common multiples and prime numbers	-recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents -compare and order fractions whose denominators are all multiples of the same number -read, write, order and compare numbers with up to three decimal places -round decimals with two decimal places to the nearest whole number and to one decimal place -identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths -read and write decimal numbers as fractions -add and subtract fractions with the same denominator and multiples of the same number -recognise mixed numbers fractions and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $2 \frac{1}{5} + \frac{4}{5} = 6 \frac{5}{5} = 1 \frac{1}{5}$)	-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, 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 -solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. (just year 6 statements connected to previous learning of fractions, multiplication and division)		-use simple formulae -generate and describe linear number sequences -express missing number problems algebraically -enumerate possibilities of combinations of two variables -find pair of numbers that satisfy an equation with two unknowns	calculate and compare -the area of squares and rectangles including using standard units, square centimetres (cm ²) and square metres (m ²) and estimate the area of irregular shapes (also included in measuring) -estimate volume and capacity -solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate -recognise that shapes with the same areas can have different perimeters and vice versa -calculate the area of parallelograms and triangles -calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres -recognise when it is possible to use formulae for area and volume of shapes -use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a	=identify 3-D shapes, including cubes and other cuboids, from 2-D representations - draw given angles, and measure them in degrees -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 - recognise, describe and build simple 3-D shapes, including making nets - illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius - recognise, describe and build simple 3-D shapes.	-complete, read and interpret information in tables including timetables -solve problems using information presented in a line graph -interpret and construct pie charts and use these to solve problems -calculate and interpret the mean as an average

			<ul style="list-style-type: none"> -use common factors to simplify fractions; use common multiples to express fractions in the same denomination -calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed and cubic metres and extending to other units -use their knowledge of the order of operations to carry out calculations involving the four operations -use estimation to check answers -solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates 	<ul style="list-style-type: none"> -multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams -solve problems involving numbers up to three decimal places -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 with a denominator of a multiple of 10 or 25. -identify the value of each digit in numbers given to three decimal places -associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$) -recall and use equivalences between simple fractions, decimals and percentages, including in different contexts -add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions -multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$) -multiply one-digit numbers with up to two decimal places by whole numbers -divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$) -multiply one-digit numbers with up to two decimal places by whole numbers -multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places -use written division methods in cases where the answer has up to two decimal places 			<ul style="list-style-type: none"> smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places -solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate -convert between miles and kilometres 	<ul style="list-style-type: none"> 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 	
Year 7	<ul style="list-style-type: none"> -Order and compare integers using inequality notation -Find the HCF and LCM of a set of numbers -Solve worded problems involving LCM -Perform Prime Factor decompositions -Apply BIDMAS to solve a calculation -Round a given number to significant figures 			<ul style="list-style-type: none"> -Reduce a ratio to its simplest form -Work with ratios with different units -Sharing in a ratio -Solve problems involving ratios -Identify link between ratios and fractions -Find the cost of items by using the unitary method -Solve best value problems 	<ul style="list-style-type: none"> -Simplify expressions by collecting like terms -Factorise simple expressions -Substitute positive and negative integers into expressions -Expand and simplify multiple single brackets -Find the nth term of a linear sequence -Identify the gradient and y intercept from a straight-line graph 		<ul style="list-style-type: none"> -Find the area of triangles, parallelograms and trapeziums -Classify triangles using angle and side properties -Solve functional problems by finding the area or perimeter of compound shapes made from rectangles -Accurately draw angles of a given size -Calculate the area and circumference of a circle -Find unknown interior angles in polygons 	<ul style="list-style-type: none"> -Find mode, median and range from a list of data -Interpret mode, median, mean and range of two data sets and make comparisons -Find averages from a frequency table -Read and complete a two-way table -Draw and interpret bar charts -Identify misleading chart figures -Complete and interpret scatter graphs including correlation and lines of best fit 	
Year 8	<ul style="list-style-type: none"> -Use HCF and LCM to find pairs of numbers -Recognise and find reciprocals as a multiplicative inverse -Estimate roots -Use rounding to significant figures to estimate in calculations -Use inequality notation to specify simple error intervals due to rounding 		<ul style="list-style-type: none"> -Solve direct proportion problems -Solve simple inverse proportion problems -Use scale factors, diagrams and maps -Adapt a recipe and use this to solve problems 	<ul style="list-style-type: none"> -Substitute negative integers into expressions and formulae including with powers -Solve one and two step linear equations -Identify a term, expression, equation, formula and identity -Write simple equations from a problem of area and perimeter of shapes -Change the subject of a simple formula -Solve linear inequalities and represent them on a number line 		<ul style="list-style-type: none"> -Construct and interpret plans and elevations of 3D shapes -Calculate the volume of cubes and cuboids -Calculate the volume of prisms -Identify parallel and perpendicular lines -Find areas of compound shapes involving circles -Carry out transformations on shapes 	<ul style="list-style-type: none"> -Find modal class, class in which median lies and estimated mean from a grouped frequency table -Compare distributions of grouped, discrete or continuous data -Construct and interpret pie charts -Find experimental probabilities and list outcomes 		
Year 9	<ul style="list-style-type: none"> -Solve complex BIDMAS calculations -Calculate with fractional and negative indices -Multiply and divide numbers in standard form -Simplify expressions involving surds 		<ul style="list-style-type: none"> -Solve complex problems using direct and inverse proportion -Form an equation using variables in direct proportion -Find missing lengths in similar shapes by using scale factors -Solve ratio problems involving concentrations of different liquids 	<ul style="list-style-type: none"> -Solve linear equations with unknowns on both sides -Change the subject of a formula where factorisation is required -Factorise a quadratic expression when the coefficient is <1 -Recognise Fibonacci sequences -Solve complex problems on a coordinate grid -Use a table of values to plot graphs -Use $y = mx + c$ -Find the equation of a line given two points -Simplify expressions using index laws 		<ul style="list-style-type: none"> -Construct and measure bearings on diagrams -Use Pythagoras's theorem to find missing lengths in right angled triangles -Use trigonometry to find missing lengths and angles in right angled triangles -Solve problems using trigonometry and Pythagoras 	<ul style="list-style-type: none"> -Apply statistics to describe a population -Apply statistics in a capture recapture problem 		
Year 10	<ul style="list-style-type: none"> -Solve problems using upper and lower bounds -Rationalise the denominator involving surds -Expand and simplify brackets involving surd 		<ul style="list-style-type: none"> -Solve direct and inverse proportion problems using K – constant of proportionality -Set up, solve and interpret problems in growth and decay including compound interest and exponential growth 			<ul style="list-style-type: none"> -Use and apply 3D Pythagoras and trigonometry -Prove two triangles are congruent -Use and apply the cosine and sine rule to solve problems -Solve bearing problems using advanced trigonometry 	<ul style="list-style-type: none"> -Plot and interpret cumulative frequency diagrams -Plot and interpret box plot diagrams -Calculate quartiles and interquartile ranges -Interpret time graphs for time series data -Read basic Venn diagrams -Form and solve problems using tree diagrams 		
Year 11	<ul style="list-style-type: none"> -Round using truncation and identify error intervals 			<ul style="list-style-type: none"> -Use algebra to construct arguments and prove identities -Expand the product of three binomials -Solve simultaneous equations involving a quadratic -Simplify and solve algebraic fractions -Change the subject of complex formulas -Find the equation of a circle -Find acceleration from a curved speed time graph -Construct algebraic proofs 		<ul style="list-style-type: none"> -Describe directional vectors as column vectors -Add and subtract vectors -Use vectors to solve geometrical problems -Use vectors to construct geometrical proofs 	<ul style="list-style-type: none"> -Find experimental and theoretical probabilities -Form and interpret Venn diagrams using set theory -Solve conditional probability problems -Find probabilities of combined events using tree diagrams with or without replacement 		
Year 12	<ul style="list-style-type: none"> -Solve logarithmic equations -Use Numerical methods to solve problems in context -Carry out binomial expansion 		<ul style="list-style-type: none"> -Solving vector problems involving ratio 	<ul style="list-style-type: none"> -Apply the laws of indices -Rationalise Surds -Work with Quadratic functions and discriminant -Solve simultaneous equations -Solve inequalities -Understand graphs and functions 	<ul style="list-style-type: none"> -Understand and use the equation of a straight line -Understand and use coordinate geometry of a circle 	<ul style="list-style-type: none"> -Solve trigonometrical equations and problems -Solve Vector problems involving magnitude 	<ul style="list-style-type: none"> -Interpret diagrams for single variable data -Understand how to calculate probability -Understand hypothetical testing 		
Year 13	<ul style="list-style-type: none"> -Work out arithmetic and geometric sequences -Work out the sum of a series -Understand and use numerical integration -Use the trapezium rule to estimate areas under a curve 		<ul style="list-style-type: none"> -Work out trigonometric ratios -Use and interpret kinematics 	<ul style="list-style-type: none"> -Work with partial fractions and algebraic division -Understand and use functions including composite functions -Understand and use parametric equations 	<ul style="list-style-type: none"> -Understand and use Newtons first law -Understand and use moments 	<ul style="list-style-type: none"> -Understand and use moments in simple static contexts -Understand and use the coefficient of frictions 	<ul style="list-style-type: none"> -Understand and use normal distribution -Conduct a statistical hypothesis test 		

Implementation – Content



Article 13: Your right to have information.

	Term 1	Term 2	Term 3
EYFS	Just Like Me It's Me 1,2,3! Light and Dark	Alive in 5! Growing 6,7,8 Building 9 & 10	To 20 and beyond First, then, now Find my pattern On the move
Year 1	Number: Place Value (within 10) Number: Addition & Subtraction (within 10) Geometry: Shape Number: Place Value (within 20)	Number: Addition & Subtraction (within 20) Number: Place Value (within 50) Measurement: Length & Height Measurement: Weight & Volume	Number: Multiplication & Division Number: Fractions Geometry: Position & Direction Number: Place Value (within 100) Measurement: Money Measurement: Time
Year 2	Number: Place value Number: Addition & Subtraction Measurement: Money Number: Multiplication & Division	Number: Multiplication & Division Statistics Geometry: Properties of shape Number: Fractions	Measurement: Length & Height Geometry: Position & Direction Measurement: Time Measurement: Mass, Capacity & Temperature
Year 3	Number: Place value Number: Addition & Subtraction Number: Multiplication & Division	Number: Multiplication & Division Measurement: Money Statistics Measurement: Length & Perimeter Number: Fractions	Number: Fractions Measurement: Time Geometry: Properties of shape Measurement: Mass & Capacity
Year 4	Number: Place value Number: Addition & Subtraction Measurement: Length & Perimeter Number: Multiplication & Division	Number: Multiplication & Division Measurement: Area Number: Fractions Number: Decimals	Number: Decimals Measurement: Money Measurement: Time Statistics Geometry: Properties of shape Geometry: Position & Direction
Year 5	Number: Place value Number: Addition & Subtraction Statistics Measurement: Perimeter & Area	Number: Multiplication & Division Number: Fractions Number: Decimals & Percentages	Number: Decimals Geometry: Properties of shape Geometry: Position & Direction Measurement: Converting units Measurement: Volume
Year 6	Number: Place value Number: Addition, Subtraction, Multiplication & Division Number: Fractions Geometry: Position & Direction	Number: Decimals Number: Percentages Number: Algebra Measurement: Converting units Measurement: Perimeter, Area & Volume Number: Ratio & Proportion	Statistics Properties of Shape Consolidation & Themed Projects
Year 7	Number: Place Value Geometry: Perimeter, Area and Units Geometry: Angles and 2D Shapes	Number: Fractions/Decimals/Percentages Algebra: Coordinates and graphs	Algebra: Order of Operations Ratio/Proportion: Ratio Statistics: Working with data
Year 8	Number: Positive & Negative numbers Number: Rounding & Estimation Geometry: 3D Shapes Geometry: Compound Measures	Statistics: Probability Algebra: Manipulation Algebra: Solving Equations	Geometry: Angles in parallel lines Geometry: Transformations
Year 9	Number: Powers and Roots Number: Fractions/Decimals/Percentages Algebra: Coordinates and Graphs	Geometry: 2D Shapes Geometry: 3D Shapes Algebra: Sequences	Ratio/Proportion: Proportion Number: Repeated Percentage Change Geometry: Constructions, Loci and Bearings
Year 10 (F)	Number: Error Intervals Ratio and Proportion Geometry: Surface area and Volume	Geometry: Angles and Bearings Geometry: Transformations Algebra: Plotting graphs Algebra: Straight Line Graphs	Statistics: Averages and Range Geometry: Compound Measures Probability
Year 10 (H)	Number: Surds/Indices Algebra: Solving Quadratics Geometry: Circle Theorems	Geometry: Similarity and Congruence Geometry: Transformations of Shapes Statistics: Probability Number: Bounds	Algebra: Graphs of Circles Algebra: Linear and Quadratic Simultaneous Equations Statistics: Histograms, Cumulative Frequency graphs
Year 11	Algebra: Iteration Algebra: Trigonometry	Geometry: Vectors Algebra: Functions Real Life Graphs	Logarithms Kinematics Vectors
Year 12 and Year 13	Algebra Proof Coordinate Geometry Trigonometry	Differentiation Integration Sampling Hypothesis Testing	Forces and Newton's laws

Implementation – GCSE Maths

Component title	Content Overview
Non-calculator paper 33.3% 1hour 30 minutes	<p>All papers will require you to:</p> <ul style="list-style-type: none">· Answer mathematical questions (50% of foundation course and 40% of higher course)· Use mathematical knowledge to solve real world problems (25% of foundation course and 30% of higher course)· Use of multiple mathematical elements to solve real world problems (25% of foundation course and 30% of higher course) <p>All papers will cover the following topics:</p> <ul style="list-style-type: none">· Number· Ratio, proportion and rates of change· Algebra· Statistics and probability· Geometry and measures
Calculator paper 1 33.3% 1hour 30 minutes	
Calculator paper 2 33.3% 1hour 30 minutes	

Implementation – A-Level Maths

Component Title	Content Overview
<p>Paper 1</p> <p>33%</p> <p>Pure mathematics</p> <p>2 hours</p>	<p>Algebra and functions</p> <p>Coordinate geometry in the (x,y) plane</p> <p>Further algebra</p> <p>Trigonometry</p> <p>Vectors</p>
<p>Paper 2</p> <p>33%</p> <p>Pure mathematics</p> <p>2 hours</p>	<p>Differentiation</p> <p>Integration</p> <p>Exponentials and logarithms</p>
<p>Paper 3</p> <p>33%</p> <p>Statistics and Mechanics</p> <p>2 hours</p>	<p><i>Statistics:</i></p> <p>Statistical sampling</p> <p>Data presentation and interpretation</p> <p>Probability</p> <p>Statistical distributions</p> <p>Statistical hypothesis testing</p> <p>Regression and correlation</p> <p>The Normal distribution</p>

Impact

Teacher questioning about and after all explanations, using techniques to ensure that all pupils are included in the questioning, allows the teacher to assess the level of understanding of their teaching. This allows future explanations to be planned during lessons. This keeps pupils at the point of learning.

Teacher guiding of first practise supports pupils with new knowledge and skills when they first use it and ensures that misconceptions are immediately rectified. Pupils are targeted for guiding based on the assessment information gleaned from lesson questioning and distance feedback.

Learning tasks are differentiated so that pupils focus on their precise next steps and practise what they most need to practise. Distance feedback, questioning and guiding allows the teacher to glean the assessment information necessary to plan this.

In the Early Years, pupils are assessed against the Early Learning Goals, a series of detailed targets covering the first steps in maths.

In KS1 and KS2 pupils are provided with opportunities for self and peer assessment and improvement using a blue pen. Marking provides children with an understanding of what they have achieved and what their next step in learning will be when applicable. Purple pen is utilised within lessons to scaffold, intervene, challenge and accelerate learning. Pupils are expected to respond to the teacher's comments with a blue pen when necessary and to show an understanding of what they need to learn next and to amend any errors made to show learning from misconceptions.

Next steps learning is an integral part of every maths lesson with pupils working on differentiated targets according to their level of learning. As each child learns a new skill, they are encouraged to secure and deepen that skill by applying it in a different way and investigating their own understanding of the mathematical skill taught.

Secondary section teachers complete class feedback logs in order to provide distance feedback. These identify individual, group and whole class misconceptions which are used to plan the next lesson's explanations, questioning, next steps and guided group.

Questioning, live tweaks to explanations, teacher guiding, a focus on next steps and class feedback logs all ensure that any knowledge or skill gaps are immediately closed so that pupils have the key information needed for subsequent learning, lessons, and examinations.

Following regular secondary section assessments, pupils are given specific targets to work on. In Years 7 to 11, Sparx Maths is used to ensure each pupil works on these specific targets. Sparx Maths is also used for weekly homework and each pupil automatically receives different questions within the same topic depending on their precise level of understanding. The algorithm picks up when more support is needed, and each question has an associated worked example video clip should the pupils need it. Sparx Maths also provides consolidation questions to ensure topics taught previously are constantly revisited to consolidate learning in long-term memory. For Years 12 and 13 Dr Frost Maths is used to provide consolidation and home learning and pupils use the platform to work on their feedback targets.

Year 10, Year 11 and Year 12 pupils complete an assessment or examination each half term. These assessments match final examination criteria and generate working at grades

for the pupils for that particular content. This assessment, combined with ongoing teacher assessment and professional judgement is used to generate half termly predicted grades.