

## CURRICULUM INTENT: MATHEMATICS

### INTENT

Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology, and engineering, and necessary for financial literacy and most forms of employment. Our high-quality Mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of Mathematics, and a sense of enjoyment and curiosity about the subject.

We believe that students deserve a creative and ambitious Mathematics curriculum, rich in skills and knowledge, which ignites curiosity and prepares them well for everyday life and future employment. Our Mathematics curriculum will give students the opportunity to:

- become fluent in the fundamentals of Mathematics, 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;
- reason mathematically by following a line of enquiry, conjecturing relationships, and generalisations, and developing an argument, justification or proof using mathematical language;
- can 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;
- can communicate, justify, argue, and prove using mathematical vocabulary;
- develop their character, including resilience, confidence, and independence, so that they contribute positively to the life of the school, their local community, and the wider environment.
- see connections between the Mathematics that they learn in school and how it might extend to outside the classroom.

### IMPLEMENTATION

Mathematics is an interconnected subject in which pupils learn to be able to move fluently between representations of mathematical ideas. We believe strongly in teaching for understanding and mastery of the subject. The programme of study for key stage 3 is sequenced into, what may appear to be, distinct domains, but pupils build on key stage 2 and connections across mathematical ideas to develop fluency, mathematical reasoning, and competence in solving increasingly sophisticated problems. The teaching for sound knowledge of key concepts then enables students to access the Key Stage 4 Scheme of Work.

Our Key Stage 4 scheme of work is structured in a similar way to Key Stage 3 however students will follow a curriculum focussed on GCSE exams. Towards the end of their journey in Key Stage 4 students will take one of 2 tiers: Foundation GCSE or Higher GCSE. Majority of our students are entered for higher tier GCSE. Both tiers build on previously mastered topics where we retrieve, affirm, and build on the knowledge and understanding as we progress through the curriculum. For example, when learning about how to apply Pythagoras' theorem in year 9 we need previous teaching from Number with an understanding of square numbers and square roots, from Algebra with the application of substitution and rearranging equations and from Geometry in the knowledge of the properties of shapes and specifically triangles.

As students approach their final year at Key stage 4 (year 11-see below), they will follow a personalised scheme of learning that targets gaps in knowledge as identified by student's performance in the frequent assessments that take place. This fully prepares them for success in their GCSE examination.

Pupils in the Further Maths/Add Maths set will be given the opportunity to study elements of Further Maths/Add Maths and if appropriate will be entered for the Level 2 Further Maths/Level 3 Add Maths qualification; this provides a solid basis for progressing onto A Level Mathematics and Further Mathematics in KS5.

Pupils also learn to apply their mathematical knowledge in Science, Geography, Computing, and other subjects.

Teachers within the department have worked collaboratively on a curriculum map which meets the Key Stage 3 national curriculum (See Below). This has informed the Subject Knowledge & Understanding (SKUs) within the different years that contain an Intent/Implementation/Impact specifically for each topic. As well as this the SKUs include key terminology that will be promoted in lessons to broaden the mathematical vocabulary for the students.

For our UFP (University Foundation Programme) maths provision curriculum content is determined based on each cohort or intake each year and schemes of work are often customised for each student and implemented as there is often huge knowledge gap in students who come from overseas. See below for the standard curriculum map. In-school assessment is the standard assessment for UFP which constitutes the foundation contents of the GCSE course.

## CURRICULUM IMPLEMENTATION: MATHEMATICS

	AUTUMN TERM		SPRING TERM		SUMMER TERM		TRIPS AND EVENTS
	Autumn1	Autumn2	Spring1	Spring 2	Summer1	Summer 2	
<b>Year 7 Knowledge:</b> What will students know?	Sequences. Algebraic notation. Equality and equivalence.	Place value. Fraction, decimal and percentage.	Addition and subtraction. Multiplication and division. Fraction & percentages of amounts.	Directed numbers. Addition and subtraction of fractions.	Construction and measurement. Geometric reasoning.	Number sense. Sets and probability. Prime numbers and proof.	<b>BANK OF ENGLAND MUSEUM</b>
<b>Year 7 Skills:</b> What skills will students have developed?	<ul style="list-style-type: none"> <li>Describing, generating and continuing sequences using term-to-term rules</li> <li>Function machines</li> <li>Basic substitution</li> </ul>	<ul style="list-style-type: none"> <li>Place value of the tenths, hundredths and thousandths digits</li> <li>Multiplying and dividing by 10, 100, 1000, including</li> </ul>	<ul style="list-style-type: none"> <li>Reading values from a table of discrete or categorical data</li> <li>Column addition</li> <li>Bar charts and vertical line charts</li> </ul>	<ul style="list-style-type: none"> <li>Comparing and ordering positive and negative numbers</li> <li>Using negative numbers in context</li> <li>Power notation and calculate simple</li> </ul>	<ul style="list-style-type: none"> <li>Identifying vertical, horizontal, parallel and perpendicular lines</li> <li>Types of angle</li> <li>Types of quadrilaterals and</li> </ul>	<ul style="list-style-type: none"> <li>Multiplying decimal numbers</li> <li>Estimating the result of a calculation by first rounding each number</li> <li>Construct Venn</li> </ul>	

	<p>with positive integers (limited to addition, subtraction, division and multiplication)</p> <ul style="list-style-type: none"> <li>• Further substitution with positive integers (including powers, roots and brackets)</li> <li>• Generating terms of a sequence given a position-to-term rule</li> <li>• Collecting like terms</li> <li>• Solving linear equations where the variable appears on one side of the equation only</li> <li>• Understanding (positive) whole numbers on a number line</li> <li>• Numbers above 100</li> <li>• Rounding a number to nearest 10, 100, 1000 and beyond</li> <li>• Multiplying and dividing by 10, 100, 1000 etc, excluding decimals</li> </ul>	<p>decimals</p> <ul style="list-style-type: none"> <li>• Rounding a number to a given number of significant figures</li> <li>• Mode, median, range from listed data</li> <li>• Conversion of large numbers to and from standard form/scientific notation</li> <li>• Conversion of small numbers to and from standard form/scientific notation</li> <li>• Fractional equivalence using factors and multiples</li> <li>• Converting between mixed numbers and improper fractions</li> <li>• Converting between terminating decimals, fractions and percentages less than 100%</li> <li>• Pie charts with any proportion</li> </ul>	<ul style="list-style-type: none"> <li>• Adding and subtracting decimal numbers</li> <li>• Perimeter of a 2D shape by adding lengths</li> <li>• Reading and using timetables and distance charts</li> <li>• Two-way tables</li> <li>• Adding or subtracting numbers in standard form/scientific notation</li> <li>• Multiplying and dividing by 10, 100, 1000 etc, excluding decimals</li> <li>• Factors of a number</li> <li>• Long column multiplication</li> <li>• Multiplying and dividing by 10, 100, 1000, including decimals</li> <li>• Completing short divisions with no remainders</li> <li>• Multiplying decimal numbers</li> <li>• Dividing decimal numbers</li> <li>• Mean as an average</li> </ul>	<p>powers, e.g. squares, cubes</p> <ul style="list-style-type: none"> <li>• Adding or subtracting a mixture of positive and negative numbers</li> <li>• Multiplying or dividing a mixture of positive and negative numbers</li> <li>• Roots and further powers</li> <li>• Further substitution with positive integers (including powers, roots and brackets)</li> <li>• Solving linear equations where the variable appears on one side of the equation only</li> <li>• Converting between mixed numbers and improper fractions</li> </ul>	<p>triangles</p> <ul style="list-style-type: none"> <li>• Measuring and drawing non-reflex angles in degrees with a protractor</li> <li>• Pie charts with any proportion</li> <li>• Constructions with lines and angles</li> <li>• Sum of the angles on a straight line and angles around a point</li> <li>• Vertically opposite angles</li> <li>• Sum of angles in a triangle</li> <li>• Base angles of an isosceles triangle</li> <li>• Sum of angles in a quadrilateral</li> <li>• Interior and exterior angles of regular and irregular polygons</li> <li>• Alternate, corresponding and cointerior angles</li> </ul>	<p>diagrams</p> <ul style="list-style-type: none"> <li>• Union, intersection and complements of sets, including the universal and empty sets</li> <li>• Probabilities using worded terms or placed on a number line between 0 and 1</li> <li>• Theoretical probabilities using counts</li> <li>• Sample space diagrams</li> <li>• Probabilities from Venn diagrams (no set notation)</li> <li>• Factors of a number</li> <li>• Power notation and calculate simple powers, e.g. squares, cubes</li> <li>• Prime numbers</li> <li>• Prime factorisation of a number</li> <li>• Lowest Common Multiple or Highest Common Factor by prime factorisation</li> </ul>	
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			<ul style="list-style-type: none"> <li>• Area of a rectangle by using the formula</li> <li>• Area of a parallelogram, triangle, and trapeziums</li> <li>• Combining means or dealing with changes to a mean</li> <li>• Fractions of an amount</li> <li>• Calculating a simple percentage of an amount, using chunking</li> <li>• Fractional original value problems</li> <li>• Percentage of an amount, using decimal multipliers</li> </ul>				
<b>Year 8 Knowledge:</b> What will students know?	Ratio and scale. Multiplicative change. Multiplying and dividing fractions.	The Cartesian plane. Representing data. Table and probability.	Brackets, equations and inequalities. Sequences. Indices.	Fractions and percentages. Standard form. Number sense.	Angles in parallel lines and polygons. Area of trapezia and circles. Symmetry and reflection.	Data handling cycle. Measures of location.	<b>BANK OF ENGLAND MUSEUM</b>
<b>Year 8 Skills:</b> What skills will students have developed?	<ul style="list-style-type: none"> <li>• Simplifying ratios and forming ratios from a given context</li> <li>• Finding a quantity within a ratio where either the total amount, a particular amount or a difference in an</li> </ul>	<ul style="list-style-type: none"> <li>• Coordinates in the first quadrant</li> <li>• Midpoint of two points</li> <li>• Determining the equation of a straight line in slope-intercept or standard form</li> <li>• Drawing a line from</li> </ul>	<ul style="list-style-type: none"> <li>• Forming linear algebraic expressions and formulae from a given context</li> <li>• Solving linear equations where the variable appears on one side of the equation only</li> </ul>	<ul style="list-style-type: none"> <li>• Fractions of an amount</li> <li>• Calculating a simple percentage of an amount, using chunking</li> <li>• Determining what percentage one number is of another</li> </ul>	<ul style="list-style-type: none"> <li>• Types of quadrilaterals and triangles</li> <li>• Interior and exterior angles of regular and irregular polygons</li> <li>• Alternate, corresponding and cointerior angles</li> </ul>	<ul style="list-style-type: none"> <li>• Pictograms</li> <li>• Bar charts and vertical line charts</li> <li>• Mode, median, range from listed data</li> <li>• Data collection methods (excluding experiments)</li> </ul>	

	<p>amount is given</p> <ul style="list-style-type: none"> <li>• Multiplicative scaling and numerical proportion relationships</li> <li>• Exchange rates</li> </ul> <p>Conversion graphs</p> <p>Scale drawings including map scales</p> <ul style="list-style-type: none"> <li>• Determine unknown lengths in similar shapes</li> <li>• Multiplying proper fractions requiring simplification</li> <li>• Dividing proper fractions</li> <li>• Multiplying fractions involving a mixed number</li> <li>• Dividing fractions involving a mixed number</li> <li>• Multiplying and dividing algebraic fractions"</li> </ul>	<p>its equation"</p> <ul style="list-style-type: none"> <li>• Reading and interpreting ungrouped frequency tables</li> <li>• Two-way tables</li> </ul> <p>Scatter graphs and correlation"</p> <ul style="list-style-type: none"> <li>• Sample space diagrams</li> <li>• Probabilities from Venn diagrams (no set notation)</li> <li>• Product rule for counting (Fundamental Counting Principle)</li> </ul>	<ul style="list-style-type: none"> <li>• Expanding a single bracket</li> <li>• Factorising out a single term</li> <li>• Solving linear equations where the variable appears on both sides of the equation</li> <li>• Expanding two brackets</li> <li>• Solving linear inequalities in one variable"</li> <li>• Describing, generating and continuing sequences using term-to-term rules</li> <li>• Generating terms of a sequence given a position-to-term rule</li> <li>• nth term formula for arithmetic sequences (no standard formulae)</li> <li>• Numerical index laws (basic)</li> <li>• Multiplying single algebraic terms (no index laws)</li> <li>• Dividing single algebraic terms (no index laws)</li> </ul> <p>Collecting like terms</p>	<ul style="list-style-type: none"> <li>• Percentage change</li> <li>• Value after a simple percentage change, using non-calculator methods</li> <li>• Value after a general percentage change, using decimal multipliers</li> <li>• Reverse percentage problems using decimal multipliers</li> <li>• Negative indices</li> <li>• Conversion of large and small numbers to and from standard form/scientific notation</li> <li>• Adding, subtracting multiplying and dividing numbers in standard form/scientific notation</li> <li>• Fractional indices</li> <li>• Rounding a number to nearest 10, 100, 1000 and beyond</li> <li>• Time conversions</li> <li>• Difference between two times or the end time after a time has elapsed</li> <li>• Converting between metric units of measure</li> </ul>	<ul style="list-style-type: none"> <li>• Constructions with lines and angles"</li> <li>• Area of a rectangle by using the formula</li> <li>• Area of a parallelogram</li> <li>• Area of a triangle</li> </ul> <p>Perimeter of rectilinear shapes</p> <ul style="list-style-type: none"> <li>• Area of composite rectilinear shapes</li> <li>• Area of composite shapes (no circles)</li> <li>• Area of trapeziums</li> <li>• Area of a full circle</li> <li>• Area or perimeter of simple fractions of circles</li> <li>• Perimeter of compound shapes that includes curved edges</li> <li>• Reflecting a shape on axes using a given mirror line</li> <li>• Reflecting a shape in a line with given equation</li> </ul>	<ul style="list-style-type: none"> <li>• Mean as an average</li> <li>• Mode, median, range from listed data</li> <li>• Mean from ungrouped frequency tables</li> <li>• Estimating the mean from grouped frequency tables</li> </ul>	
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				<ul style="list-style-type: none"> <li>• Order of operations (no powers and roots)</li> <li>• Exchange rates</li> <li>Rounding a number to a given number of significant figures</li> <li>• Estimating the result of a calculation by first rounding each number</li> <li>• Upper and lower bound of rounded values or identifying an error interval</li> <li>• Converting between units of area and volume</li> </ul>			
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**GCSE Examination Board: Edexcel**

<b>Year 9 Knowledge:</b> What will students know?	Straight line graphs Forming and solving equations Testing conjectures	3D shapes Constructions and congruency	Numbers Using percentages Maths and money	Deduction Rotation and translation Pythagoras' theorem	Enlargement and similarity Ratio and proportion problems Rates	Probability Algebraic representation Revision	<b>BLETCHLEY PARK –CODES AND CIPHERS</b>
<b>Year 9 Skills:</b> What skills will students have developed?	<ul style="list-style-type: none"> <li>• Relationship between a line and its equation</li> <li>• Gradient of a line</li> <li>• Understanding the equation of a straight line in slope-intercept form (<math>y=mx+c</math>) or</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction to 3D shapes</li> <li>• Volume of a cube or cuboid</li> <li>• Front elevation, side elevation and plan of a 3D shape</li> <li>• Volume of a prism</li> </ul>	<ul style="list-style-type: none"> <li>• Column addition</li> <li>• Adding and subtracting fractions with the same denominator</li> <li>• Long column multiplication</li> <li>• Adding and</li> </ul>	<ul style="list-style-type: none"> <li>• Alternate, corresponding and cointerior angles</li> <li>• Constructions with lines and angles</li> <li>• Rotational symmetry</li> <li>• Rotating a shape by</li> </ul>	<ul style="list-style-type: none"> <li>• Determine unknown lengths in similar shapes</li> <li>• Enlarging/dilating a shape by a given positive integer scale factor</li> <li>• Enlarging/dilating a</li> </ul>	<ul style="list-style-type: none"> <li>• Theoretical probabilities using counts</li> <li>• Experimental probabilities and bias</li> <li>• Probability of independent and successive</li> </ul>	

	<p>standard form (<math>ax + by = c</math>)</p> <ul style="list-style-type: none"> <li>• Determining the equation of a straight line in slope-intercept or standard form</li> <li>• Drawing a line from its equation</li> <li>• Equations of perpendicular lines</li> <li>• Solving linear equations where the variable appears on one side of the equation only</li> <li>• Changing the subject where the variable appears once only, excluding brackets</li> <li>• Solving linear equations where the variable appears on both sides of the equation</li> <li>• Solving linear inequalities in one variable"</li> <li>• Factors of a number</li> <li>• Prime numbers</li> <li>• Prime factorisation of a number</li> <li>• Expanding a single and two brackets</li> </ul>	<p>Surface area of a cuboid and prisms</p> <ul style="list-style-type: none"> <li>• Volume of a cylinder</li> <li>• Surface area of a cylinder</li> <li>• Volume of a pyramid, cone or sphere</li> <li>• Measuring and drawing non-reflex angles in degrees with a protractor</li> <li>• Constructions with lines and angles</li> <li>• Loci</li> <li>• Proving triangle congruence using SSS, SAS, ASA and RHS</li> </ul>	<p>subtracting decimal numbers</p> <ul style="list-style-type: none"> <li>• Completing short divisions with no remainders</li> <li>• Adding and subtracting mixed numbers with different denominators</li> <li>• Multiplying and dividing decimal numbers</li> <li>• LCM or HCF by prime factorisation</li> <li>• Multiplying and dividing proper fractions requiring simplification</li> <li>• Multiplying and dividing fractions involving a mixed number</li> <li>• Conversion of large and small numbers to and from standard form/scientific notation</li> <li>• Multiplying and dividing numbers in standard form/scientific notation</li> <li>• Simplifying surds</li> <li>• Converting between terminating decimals,</li> </ul>	<p>a given angle around a given point</p> <ul style="list-style-type: none"> <li>• Translations of shapes by a vector"</li> <li>• Pythagoras' theorem in 2D (excluding surds)</li> <li>• Distance between two points given their coordinates</li> </ul>	<p>shape by a decimal or fractional scale factor</p> <ul style="list-style-type: none"> <li>• Multiplicative scaling and numerical proportion relationships</li> <li>• Simplifying ratios and forming ratios from a given context</li> <li>• Finding a quantity within a ratio where either the total amount, a particular amount or a difference in an amount is given</li> <li>• Conversion graphs</li> <li>• Speed calculations for a single journey</li> <li>• Constructing and reading distance-time graphs</li> <li>• Density</li> </ul>	<p>independent events (including tree diagrams)</p> <ul style="list-style-type: none"> <li>• Successive dependent events, i.e. sampling without replacement (including tree diagrams)</li> <li>• Probabilities from Venn diagrams (no set notation)</li> <li>• Solving linear simultaneous equations/systems of equations using graphical methods</li> <li>• Plotting quadratic graphs from a table of values</li> <li>• Inequalities in two variables, including their representation on a plane.</li> </ul>	
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			fractions and percentages less than 100% <ul style="list-style-type: none"> <li>• Determining what percentage one number is of another</li> <li>• Percentage change</li> <li>Value after a simple percentage change, using non-calculator methods</li> <li>• Value after a general percentage change, using decimal multipliers</li> <li>• Reverse percentage problems using decimal multipliers</li> <li>• Calculating values after compound percentage changes</li> <li>• Multiplicative scaling and numerical proportion relationships</li> <li>• Exchange rates</li> </ul>				
<b>Year 10 Knowledge:</b> What will students know?	Congruence, similarity and enlargement Trigonometry	Representing solutions of equations and inequalities Simultaneous equations	Angles and bearings Circles Vectors	Ratios and fractions Percentages and interest Probability	Collecting, representing and interpreting data Non-calculator methods	Types of number and sequences Indices and roots Manipulating Expressions	<b>BLETCHLEY PARK –CODES AND CIPHERS</b>
<b>Year 10 Skills:</b> What skills will students have	<ul style="list-style-type: none"> <li>• Alternate, corresponding and cointerior angles</li> <li>• Determine</li> </ul>	<ul style="list-style-type: none"> <li>• Drawing a line from its equation</li> <li>• Understanding algebraic statements</li> </ul>	<ul style="list-style-type: none"> <li>• Bearings (excluding trigonometry)</li> <li>• Area or perimeter of simple fractions of</li> </ul>	<ul style="list-style-type: none"> <li>• Multiplicative scaling and numerical proportion relationships</li> </ul>	<ul style="list-style-type: none"> <li>• Bar charts and vertical line charts</li> <li>• Mean, mode, median, range from</li> </ul>	<ul style="list-style-type: none"> <li>• Prime factorisation of a number</li> <li>• LCM or HCF by prime factorisation</li> </ul>	



developed?	<p>unknown lengths in similar shapes</p> <ul style="list-style-type: none"> <li>• Enlarging/dilating a shape by a given positive integer scale factor</li> <li>• Enlarging/dilating a shape by a decimal or fractional scale factor</li> <li>• Relationship between scale factors of length, area and volume</li> <li>• Pythagoras' theorem in 2D (excluding surds)</li> <li>• Trigonometry to determine side lengths and angles in a right-angled triangle</li> <li>• Exact trigonometric values</li> <li>• Sine and cosine rules to determine lengths and angles in a non-right angled triangle</li> <li>• Area of a triangle using two lengths and the angle between them</li> </ul>	<p>of inequality</p> <ul style="list-style-type: none"> <li>• Factorising quadratic expressions given in the form <math>x^2 + bx + c</math></li> <li>• Factorising the difference of two squares</li> <li>• Solving quadratic equations by factorisation</li> <li>• Solving quadratic inequalities</li> <li>• Solving linear simultaneous equations/systems of equations using graphical methods</li> <li>• Solving linear simultaneous equations/systems of equations using elimination or substitution</li> <li>• Solving non-linear simultaneous equations/systems of equations by substitution</li> <li>• Using graphs to find approximate solutions to equations</li> </ul>	<p>circles</p> <ul style="list-style-type: none"> <li>• Volume of a cylinder</li> <li>• Further terms in relation to circles, including chord and segment</li> <li>• Arc length of more general sectors</li> <li>• Area of more general sectors</li> <li>• Relationship between scale factors of length, area and volume</li> <li>• Volume of a pyramid, cone or sphere</li> <li>• Surface area of a pyramid, cone or sphere/hemisphere</li> <li>• Circle theorems</li> <li>• Adding, subtracting and scaling column vectors</li> <li>• Magnitude of a column vector</li> <li>• Vectors using variables</li> </ul>	<ul style="list-style-type: none"> <li>• Exchange rates</li> </ul> <p>Simplifying ratios and forming ratios from a given context</p> <ul style="list-style-type: none"> <li>• Finding a quantity within a ratio where either the total amount, a particular amount or a difference in an amount is given</li> <li>• Combining ratios and proportions into a single ratio</li> <li>• Relationship between scale factors of length, area and volume</li> <li>• Calculating a simple percentage of an amount, using chunking</li> <li>• Converting between terminating decimals, fractions and percentages less than 100%</li> <li>• Determining what percentage one number is of another</li> <li>Percentage of an amount, using decimal multipliers</li> <li>• Value after a simple percentage change, using non-calculator</li> </ul>	<p>listed data</p> <ul style="list-style-type: none"> <li>• Reading and interpreting ungrouped frequency tables</li> <li>• Mean from ungrouped frequency tables</li> <li>• Two-way tables</li> <li>• Stem-and-leaf diagrams</li> <li>• Scatter graphs and correlation</li> <li>• Pie charts with any proportion</li> <li>• Estimating the mean from grouped frequency tables</li> <li>• Frequency polygons</li> <li>• Stratified sampling</li> <li>• Cumulative frequency graphs</li> <li>• Box plots / box and whisker diagrams (excluding outliers)</li> <li>• Histograms and frequency density (unequal class widths)</li> <li>• Rounding a number to nearest 10, 100, 1000 and beyond</li> <li>• Column addition</li> <li>• Adding and subtracting fractions with the same</li> </ul>	<ul style="list-style-type: none"> <li>• Describing, generating and continuing sequences using term-to-term rules</li> <li>nth term formula for arithmetic sequences (no standard formulae)</li> <li>• Determining if a term belongs in an arithmetic sequence</li> <li>nth term formula for a quadratic sequence</li> <li>• Power notation and calculate simple powers, e.g. squares, cubes</li> <li>• Roots and further powers</li> <li>• Numerical index laws (basic)</li> <li>• Multiplying and dividing numbers in standard form/scientific notation</li> <li>• Fractional indices</li> <li>Multiplying single algebraic terms (no index laws)</li> <li>• Dividing single algebraic terms (no index laws)</li> <li>• Collecting like terms</li> <li>• Expanding a single</li> </ul>	
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				<p>methods</p> <ul style="list-style-type: none"> <li>• Value after a general percentage change, using decimal multipliers</li> <li>• Reverse percentage problems using decimal multipliers</li> <li>• Calculating values after compound percentage changes</li> <li>• Compound percentage problems with unknown period or step percentage change</li> <li>• Fixed point iteration to approximate a solution to an equation</li> <li>• Adding and subtracting fractions with the same denominator</li> <li>• Multiplying proper fractions requiring simplification</li> <li>• Dividing proper fractions</li> <li>• Theoretical probabilities using counts</li> <li>• Probabilities of mutually exclusive events</li> <li>• Experimental</li> </ul>	<p>denominator</p> <ul style="list-style-type: none"> <li>• Long column multiplication</li> <li>• Adding and subtracting decimal numbers</li> <li>• Rounding a number to a given number of decimal places</li> <li>• Completing short divisions with no remainders</li> <li>• Multiplying and dividing decimal numbers</li> <li>• Multiplying and dividing proper fractions</li> <li>• Multiplying and dividing fractions involving a mixed number</li> <li>• Rounding a number to a given number of significant figures</li> <li>• Estimating the result of a calculation by first rounding each number</li> <li>• Converting from a recurring decimal to a fraction</li> <li>• Upper and lower bound of rounded values or identifying an error interval</li> </ul>	<p>bracket</p>	
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				probabilities and bias <ul style="list-style-type: none"> <li>• Probability of independent and successive independent events (including tree diagrams)</li> <li>• Successive dependent events, i.e. sampling without replacement (including tree diagrams)</li> <li>• Probabilities from Venn diagrams (no set notation)</li> </ul>	<ul style="list-style-type: none"> <li>• Simplifying surds</li> <li>• Multiplying, dividing, adding and subtracting surds</li> <li>• Using lower and upper bounds within calculations to calculate a further lower/upper bound</li> <li>• Rationalising the denominator where the denominator consists of a single surd term</li> <li>• Rationalising the denominator where the denominator consists of a surd and a second term</li> </ul>		
<b>Year 11 Knowledge:</b> What will students know?	Gradients and lines Non-linear graphs Using graphs	Expanding and factorising Changing the subject Functions	Multiplicative reasoning Geometric reasoning Algebraic reasoning	Transforming and constructing Listing and describing Show that...	<b>Revision and Examinations</b>	<b>Revision and Examinations</b>	<b>BLETCHLEY PARK –CODES AND CIPHERS</b>
<b>Year 11 Skills:</b> What skills will students have developed?	<ul style="list-style-type: none"> <li>• Relationship between a line and its equation</li> <li>• Gradient of a line</li> <li>• Understanding the equation of a straight line in slope-intercept form (<math>y=mx+c</math>) or standard form (<math>ax + by = c</math>)</li> <li>• Determining the</li> </ul>	<ul style="list-style-type: none"> <li>• Expanding a single bracket</li> <li>• Factorising out a single term</li> <li>• Expanding two brackets</li> <li>• Expanding three (or more) brackets</li> <li>• Factorising a quadratic where the coefficient of the <math>x^2</math></li> </ul>	<ul style="list-style-type: none"> <li>• Multiplicative scaling and numerical proportion relationships</li> <li>• Simplifying ratios and forming ratios from a given context</li> <li>• Finding a quantity within a ratio where either the total amount, a particular</li> </ul>	<ul style="list-style-type: none"> <li>• Describing a reflection</li> <li>• Rotational symmetry</li> <li>• Describing a rotation</li> <li>• Constructions with lines and angles</li> <li>• Loci</li> <li>• Describing an enlargement/dilation</li> </ul>			

	<p>equation of a straight line in slope-intercept or standard form</p> <ul style="list-style-type: none"> <li>• Drawing a line from its equation</li> <li>• Equations of parallel lines</li> <li>• Solving linear simultaneous equations/systems of equations using graphical methods</li> <li>• Equations of perpendicular lines</li> <li>• Plotting quadratic graphs from a table of values</li> <li>• Determining the values of p and q in the exponential function <math>y = pq^x</math></li> <li>• Recognising the shape of basic forms of cubic, reciprocal and exponential graphs based on their equations</li> <li>• Graphs of circles centred at the origin</li> <li>• Equation of a tangent to a circle centred at the origin</li> <li>• Reflecting a shape on axes using a given mirror line</li> <li>• Conversion graphs</li> </ul>	<p>term is not 1</p> <ul style="list-style-type: none"> <li>• Completing the square to put an expression in the form <math>(x+a)^2 + b</math></li> <li>• Completing the square to put an expression in the form <math>a(x+b)^2 + c</math></li> <li>• Quadratic formula to solve quadratic equations</li> <li>• Solving linear equations where the variable appears on one side of the equation only</li> <li>• Changing the subject where the variable appears once only, excluding brackets</li> <li>• Solving linear equations where the variable appears on both sides of the equation</li> <li>• Solving linear inequalities in one variable</li> <li>• Changing the subject of a formula where the subject appears multiple times</li> <li>• Fixed point iteration</li> </ul>	<p>amount or a difference in an amount is given</p> <ul style="list-style-type: none"> <li>• Combining ratios and proportions into a single ratio</li> <li>• Algebraic direct and inverse proportion</li> <li>• Problem solving with ratios</li> <li>• Sum of the angles on a straight line and angles around a point</li> <li>• Vertically opposite angles</li> <li>• Sum of angles in a triangle</li> <li>• Base angles of an isosceles triangle</li> <li>• Sum of angles in a quadrilateral</li> <li>• Interior and exterior angles of regular and irregular polygons</li> <li>• Alternate, corresponding and co-interior angles</li> <li>• Pythagoras' theorem in 2D (excluding surds)</li> <li>• Distance between two points given their coordinates</li> <li>• Trigonometry to determine side lengths and angles in</li> </ul>	<p>for a positive integer scale factor</p> <ul style="list-style-type: none"> <li>• Enlarging/dilating a shape by a given positive integer scale factor</li> <li>• Describing an enlargement/dilation for a positive decimal or positive fractional scale factor</li> <li>• Enlarging/dilating a shape by a decimal or fractional scale factor</li> <li>• Translations of shapes by a vector</li> <li>• Describing translations using vector notation</li> <li>• Plotting and recognising graphs of trigonometric functions</li> <li>• Graph transformations of <math>y = f(x+a)</math> and <math>y = f(x) + a</math></li> <li>• Graph transformations of <math>y = f(-x)</math> and <math>y = -f(x)</math></li> <li>• Front elevation, side elevation and plan of a 3D shape</li> <li>• Construct Venn diagrams</li> <li>• Scatter graphs and</li> </ul>			
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	<ul style="list-style-type: none"> <li>• Reflecting a shape in a line with given equation</li> <li>• Constructing and reading distance-time graphs</li> <li>• Using graphs to find approximate solutions to equations</li> <li>• Understanding and drawing speed-time graphs</li> <li>• Estimating area under a curved graph</li> </ul>	<p>to approximate a solution to an equation</p> <ul style="list-style-type: none"> <li>• Function machines</li> <li>• Basic substitution with positive integers (limited to addition, subtraction, division and multiplication)</li> <li>• Further substitution with positive integers (including powers, roots and brackets)</li> <li>• Trigonometry to determine side lengths and angles in a right-angled triangle</li> <li>• Quadratic graphs and their features</li> <li>• Exact trigonometric values</li> <li>• Minimum or maximum point of a quadratic graph by completing the square</li> <li>• Function notation and calculating outputs or inputs of a function</li> <li>• Composite functions (excluding exponentials and modulus)</li> <li>• Inverse functions (excluding</li> </ul>	<p>a right-angled triangle</p> <ul style="list-style-type: none"> <li>• Adding, subtracting and scaling column vectors</li> <li>• Circle theorems</li> <li>• Vectors using variables</li> <li>• Multiplying and dividing single algebraic terms (no index laws)</li> <li>• nth term formula for arithmetic sequences (no standard formulae)</li> <li>• Solving linear simultaneous equations/systems of equations using elimination or substitution</li> <li>• nth term formula for a quadratic sequence</li> <li>• Solving non-linear simultaneous equations/systems of equations by substitution</li> <li>• Testing conjectures and identifying counterexamples</li> <li>• Algebraic proofs involving integers</li> <li>• Inequalities in two variables, including</li> </ul>	<p>correlation</p> <ul style="list-style-type: none"> <li>• Sample space diagrams</li> <li>• Product rule for counting (Fundamental Counting Principle)</li> <li>• Proving triangle congruence using SSS, SAS, ASA and RHS</li> </ul>			
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		exponentials and modulus) • Solving quadratic inequalities	their representation on a plane.				
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## IMPACT:

We are confident that through the content of the curriculum and the way in which it is delivered pupils will:

- become fluent in the fundamentals of Mathematics
- be able to reason mathematically and solve problems by applying their mathematical knowledge to a variety of situations.
- achieve age related expectations in Mathematics each year (most pupils).
- understand and appreciate the position that Mathematics holds in everyday life.
- develop progressively as they move through the school, not only to enable them to meet the requirements of the National Curriculum but to prepare them to become competent mathematicians in secondary education and beyond.
- be well prepared for their next stage of learning and will have a clear understanding of what they have been taught and where their learning will take them next.
- develop resilience through experiencing failure but realise being wrong can be part of the process to finding a solution.
- develop a love of Mathematics and a thirst for further learning through experiencing Mathematics within a positive culture.

Impact will be measured in a number of ways:

- Through rigorous, reliable and accessible assessment. On-going assessment will occur through teacher monitoring of class work, discussions with pupils and formal assessments. Outcomes of these will be analysed and discussed within the department and interventions and extra support set up where appropriate. Assessment outcomes will be compared to targets. Specific groups such as SEN & Disadvantaged will be closely monitored.
- Lesson observations and work scrutiny.
- Destination data at transition points – Key Stage 3 to GCSE, GCSE to A level.