



Curriculum Statement

At Yate Academy, we build students' mathematical confidence, helping them form a positive relationship with the subject and become resilient learners. Our spiralling curriculum deepens understanding each year, building on prior knowledge. We focus on strong knowledge and mathematical vocabulary to ensure students can build on what they know and understand new concepts effectively.

In Key Stage 3 we start each year by reinforcing number skills, progressing through topics developing algebra, geometry and statistics knowledge. This logical structure helps students develop a solid mathematical understanding that provides the basis for them to progress at Key Stage 4. Those students continuing their mathematical journey in Key Stage 5, will continue to focus on algebra, exploring how it links all elements of mathematics together and leads onto more complex mathematical concepts such as calculus. In statistics and mechanics we look at how to apply these mathematical concepts to real world problems.

Lessons are carefully planned with manageable steps, promoting connections between ideas and deepening understanding. We emphasise fluency, helping students quickly recall key facts and apply their knowledge confidently to solve problems and reason through mathematical concepts. Our teaching methods are informed by the latest pedagogical research, ensuring effective learning and enjoyment of maths. Ultimately, we aim to equip students with the skills and confidence to succeed in maths and beyond.

	Year 7	Year 8	Year 9
Term 1 & 2	<p>In Year 7, students are given the chance to strengthen their fluency and confidence in the core concepts from Key Stage 2, while expanding their understanding and their reasoning abilities.</p> <p>They apply fundamental concepts from Key Stage 2 to more complex topics like ratio and solving linear equations.</p> <p>Additionally, students begin to develop basic calculator skills, applying these techniques in lessons calculating powers and roots and converting units of time using the degrees, minutes, seconds button.</p> <p>Throughout Terms 1 and 2, our focus is on Number.</p> <p>Students will explore:</p> <p>Place Value & Rounding</p> <ul style="list-style-type: none"> ● Understanding place value ● Order positive integers and decimals ● Round numbers to decimal places and significant figures 	<p>In Year 8, students will continue to deepen their understanding of topics introduced in Year 7 and primary school.</p> <p>In Terms 1 and 2, our focus is on Number.</p> <p>Students will expand their understanding of percentages by learning methods that involve decimal multipliers. Later in the year, they will also extend their knowledge of number systems, including their introduction to the first irrational number: π. Throughout the year, calculator use will be integral to their learning.</p> <p>Students will explore:</p> <p>Estimating</p> <ul style="list-style-type: none"> ● Rounding to decimal places ● Rounding to a given number of significant figures ● Estimate answers to calculations by rounding to 1 significant figure 	<p>Our Year 9 curriculum ensures that students continue to build on the knowledge they've gained in Years 7 and 8, further deepening their understanding while providing opportunities to develop their reasoning and problem-solving skills.</p> <p>Number is the focus for Terms 1 and 2. During these terms, we introduce more challenging content such as surds, fractional indices, and recurring decimals. These topics will not only challenge students but also help them build resilience and confidence as they prepare for Year 10.</p> <p>Students will explore:</p> <p>Bounds</p> <ul style="list-style-type: none"> ● Rounding to decimal places and significant figures ● Truncate to a given number of decimal places ● Error Intervals ● Estimation

	<p><u>Mental & Written Methods</u></p> <ul style="list-style-type: none"> ● Add and subtract integers and decimals, including use of formal written methods and apply to problems context ● Multiply and divide integers and decimals, including use of formal methods and apply to problems in context ● Understand and apply the order of operations <p><u>Negative Numbers</u></p> <ul style="list-style-type: none"> ● Ordering negative integers & decimals ● Four Operations - Integers <p><u>Types of Number</u></p> <ul style="list-style-type: none"> ● Recognise prime numbers, square numbers, cube numbers, triangular numbers ● Explore powers and roots ● Use a scientific calculator to calculate powers and roots <p><u>Factors & Multiples</u></p> <ul style="list-style-type: none"> ● Identify multiples and factors ● Know meaning of highest common factor and lowest common multiple ● HCF and LCM by listing 	<p><u>Operations with Decimals</u></p> <ul style="list-style-type: none"> ● Add, subtract, multiply and divide integers and decimals ● Apply four operations to functional skills money problems <p><u>Negative Numbers</u></p> <ul style="list-style-type: none"> ● Use negatives for temperature & in context ● Four Operations - Fractions & Decimals <p><u>Laws of Indices</u></p> <ul style="list-style-type: none"> ● Explore powers and roots ● Use index laws to simplify and calculate expressions involving $x/\sqrt[n]{\quad}$ <p><u>Prime Factor Form - HCF/LCM</u></p> <ul style="list-style-type: none"> ● Prime factor decomposition ● Use prime factors to identify HCF and LCM of larger numbers ● Use venn diagrams to find HCF and LCM 	<p><u>Standard Form</u></p> <ul style="list-style-type: none"> ● Write ordinary numbers in standard form and vice versa ● Calculate with and interpret standard form ● Solve problems involving standard form <p><u>Surds / Fractional & Negative Indices</u></p> <ul style="list-style-type: none"> ● Surd notation ● Simplifying surds and four operations ● Expanding brackets with surds ● Rationalise a denominator ● Laws of indices, including rewriting indices to the same base ● Negative indices ● Fractional indices <p><u>HCF / LCM Problems</u></p> <ul style="list-style-type: none"> ● HCF and LCM by listing ● Prime factor decomposition and using venn diagrams to find HCF and LCM ● Solve worded problems
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	<p><u>Fractions</u></p> <ul style="list-style-type: none"> ● Convert fractions, decimals and percentages ● Equivalent fractions ● Ordering fractions ● Convert mixed to improper fractions and vice versa ● Fractions of amounts ● Add , subtract, multiply and divide fractions with integers and fractions ● Simplify fractions <p><u>Time</u></p> <ul style="list-style-type: none"> ● Telling the time using the 12 and 24 hour clock ● Telling the time using an analogue clock ● Addition of time ● Converting units of time using the degrees, minutes, seconds calculator button on scientific calculator 	<p><u>Fractions & Mixed Numbers</u></p> <ul style="list-style-type: none"> ● Simplify fractions ● Equivalent fractions ● Compare fractions ● Fractions of amounts ● Convert fractions to decimals and vice versa ● Add , subtract, multiply and divide fractions with integers and fractions <p><u>Percentage Multipliers</u></p> <ul style="list-style-type: none"> ● Calculate percentages of amounts (including calculator methods) ● Percentage increase and decrease (including calculator methods) ● Real-life problems involving percentages <p><u>Reading Timetables</u></p> <ul style="list-style-type: none"> ● Converting units of time using the degrees, minutes, seconds calculator button on scientific calculator ● Reading and using timetables 	<p><u>Algebraic Fractions & Recurring Decimals to Fractions</u></p> <ul style="list-style-type: none"> ● Mixed to improper fractions and vice versa ● Four operations with fractions and mixed numbers ● Use fractions to solve problems ● Convert recurring decimals to fractions and vice versa ● Simplify algebraic fractions <p><u>Real Life Percentages</u></p> <ul style="list-style-type: none"> ● Percentage increase and decrease problems ● Calculate simple interest ● Calculate compound interest ● Percentage change ● Reverse percentages
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Term 3 & 4

In Terms 3 and 4, students further develop their fluency and confidence in the fundamental concepts from Key Stage 2, while deepening their understanding and strengthening their reasoning skills. They apply key ideas to more advanced topics such as algebraic manipulation.

The **primary focus during these terms is Ratio and Algebra**. Students will explore:

Percentages of Amounts

- Define percentage as ‘number of parts per hundred’
- Find 50%, 25%, 10%, 5% and 1% of an amount without a calculator
- Solve problems involving percentage increase and decrease without a calculator

Ratio

- Ratio notation
- Simplifying ratio
- Sharing ratio (two parts)
- Recipes (using ratio tables)

Algebraic Notation

- Use notation and symbols correctly eg. ab in place of $a \times b$, $3y$ in place of $y+y+y$ and 3

In Terms 3 and 4, we **focus on Ratio and Algebra**, further developing students' understanding of topics introduced in Year 7.

For instance, their work with algebraic expressions will be extended to include index laws, expanding double brackets, and factorising.

We will also continue to build on the fundamental concepts of ratio and proportion first introduced in primary school.

Students will explore:

Ratio and Scale

- Write ratios in the form $1:n$ or $n:1$
- Sharing ratio (two or three parts)
- Recipe problems
- Proportion - Unitary Method
- Best buys
- Interpret maps and scale drawings

Terms 3 and 4 **focus on Ratio and Algebra**. During this term, we will build on knowledge from Year 7 and 8 but also begin to introduce some more challenging content such as algebraic direct and inverse proportion, expanding triple brackets and simultaneous equations.

Students will explore:

Ratio and Proportion

- Sharing ratio - total given, one person given, difference given
- **Combining ratio**
- Convert between currencies and measure
- Solve problems involving ratio and proportion
- Algebraic direct and inverse proportion

x y etc

Algebraic Manipulation (including Expanding Single Brackets)

- Simplify algebraic expressions
- Expand single brackets
- Substitution into formulae/expressions

Solving linear equations with an unknown on one side

- Solve linear equations with one unknown
- Solve linear equations which include brackets, negative signs and those with a negative solution
- Use linear equations to solve worded problems

Algebraic Manipulation (including Expanding and Factorising)

- Simplify algebraic expressions
- Expand single brackets
- Factorise algebraic expressions
- Expand and simplify double brackets

Solving Linear Equations with an Unknown on Both Sides

- Solve simple linear equations with unknowns on both sides
- Solve linear equations which include brackets, negative signs and those with a negative solution
- Use linear equations to solve worded problems

Linear Inequalities

- Solve simple linear inequalities
- Represent inequalities on a number line

Expanding and Factorising quadratics

- Expand single and double brackets
- Factorise algebraic expressions (including quadratic expressions)
- Difference of two squares
- Solve quadratic equations algebraically by factorising
- Expand triple brackets
- Substitution into maths and scientific formulae

Solving Equations and Changing the Subject

- Form and solve two-step equations
- Solve equations with unknowns on both sides, including brackets
- Form and solve two-sided inequalities
- Using algebra to solve area and perimeter problems
- Changing the subject of a formula

	<p><u>Sequences</u></p> <ul style="list-style-type: none"> ● Finding missing numbers in a number pattern or sequence ● Continue a sequence derived from diagrams ● Recognise and continue the Fibonacci sequence <p><u>Probability Scale</u></p> <ul style="list-style-type: none"> ● Use appropriate language and the probability scale ● Understand that probabilities sum to 1 	<p><u>Linear Sequences</u></p> <ul style="list-style-type: none"> ● Find nth term of a number/pictorial sequence ● Use nth term to find a given number in a sequence ● Generate terms of a sequence from a term-to-term rule <p><u>Coordinates and Graphs</u></p> <ul style="list-style-type: none"> ● Use axes and coordinates to specify points in all four quadrants (2D) ● Midpoint of a line segment ● Introduction to $y = mx + c$ <p><u>Probability</u></p> <ul style="list-style-type: none"> ● Understand that probabilities sum to 1 ● Sample space diagrams ● Two-way tables ● Relative frequency <p><u>Averages from a Frequency Table.</u></p> <ul style="list-style-type: none"> ● Calculate mean, median, mode and range for discrete data ● Calculate averages from a frequency table 	<p><u>Applied Sequences</u></p> <ul style="list-style-type: none"> ● Find nth term of an arithmetic sequence ● Use nth term to generate terms of a sequence ● Introduction to quadratic sequences <p><u>Equations of a Straight Line</u></p> <ul style="list-style-type: none"> ● Find gradient and y-intercept from linear equations ● Find gradient of a line from a graph ● Find gradient between two points ● Find equations of lines parallel or perpendicular to a given line <p><u>Probability Trees and Venn Diagrams</u></p> <ul style="list-style-type: none"> ● Mutually exclusive events ● Expected results for experimental and theoretical probabilities ● Calculate probabilities of repeated events ● Introduction to probability tree diagrams
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In Terms 5 and 6, **our focus shifts to Geometry and Measure**. Students will refine their calculator skills and apply these techniques to topics such as averages, area, and angles.

They will explore:

Averages from a List

- Interpret the mean, median, mode and range as averages

Area and Perimeter of 2D Shapes

- Identify and name regular and irregular polygons
- Names and properties of quadrilaterals
- Perimeter of regular and irregular 2D shapes
- Area of triangles, parallelograms, trapezia
- Perimeter of compound shapes
- Area and perimeter questions involving algebra

Properties of 2D and 3D Shapes

- Names and properties of 2D and 3D shapes
- Nets of 3D shapes

Construction of Angles and Triangles

- Know angles are measured in degrees
- Measure and draw angles, to the nearest

In Terms 5 and 6, we **focus on Geometry and Measure**.

Students will expand their understanding of number systems, with their introduction to the first irrational number: π .

Students will explore:

Circles

- Circle properties
- Formulae for area and circumference of a circle
- Perimeters and areas of semicircles and quarter circles

Volume and Surface Area

- Area of compound shapes
- Calculate volume of a cube, cuboid, prism & cylinder
- Calculate surface area of a cube/cuboid

Constructions and Loci

- Construct the perpendicular bisector of a line

In Terms 5 and 6, our **focus is on Geometry and Measure**. Students will be introduced to new and engaging mathematical concepts that build upon their existing skills and knowledge. For instance, Pythagoras' Theorem combines powers, roots, substitution, equations, and rounding to find missing lengths in right-angled triangles. These topics help students develop their critical thinking abilities and tackle more complex problem-solving tasks.

Students will explore

Arcs and Sectors of Circles

- Calculate area and circumference
- Perimeter and area of semicircles and quarter circles
- Calculate arc lengths, angles and areas of sectors of circles

Volume and Surface Area

- Volume in context
- Calculate surface area of a cube, cuboid, prism & cylinder
- Volume and surface area of cylinder, sphere, pyramid, cone

Pythagoras Theorem and Trigonometry

- Use pythagoras' theorem to calculate

	<p>degree</p> <ul style="list-style-type: none"> Construction of SAS, ASA, SSS triangles <p><u>Angle Properties</u></p> <ul style="list-style-type: none"> Angles around a point, straight line, vertically opposite Find missing angles in a triangle / quadrilateral <p><u>Basic Data Representation</u></p> <ul style="list-style-type: none"> Types of data Construct and interpret tally charts, frequency tables, bar charts, pictograms and stem and leaf Averages from stem and leaf diagrams 	<ul style="list-style-type: none"> Angle bisectors Construct angles <p><u>Angles in Parallel Lines</u></p> <ul style="list-style-type: none"> Angles around a point, straight line, vertically opposite Angle properties of parallel and perpendicular lines Find missing angles using co-interior, corresponding and alternate angles <p><u>Scatter Graphs & Pie Charts</u></p> <ul style="list-style-type: none"> Use and interpret scatter graphs Correlation Line of best fit Draw and interpret pie charts <p><u>Converting Units of Measure</u></p> <ul style="list-style-type: none"> Convert between related standard units (length, area, volume) and compound units (speed, density, pressure) Speed Density <p><u>Congruent and Similar Shapes</u></p> <ul style="list-style-type: none"> Show two triangles are congruent Conditions of congruence (SAS, SSS, ASA) 	<p>missing side lengths in right angled triangles</p> <ul style="list-style-type: none"> Calculate the length of a line segment Introduction to trigonometry <p><u>Angles in Polygons</u></p> <ul style="list-style-type: none"> Angle properties of parallel lines Interior and exterior angles of regular and irregular polygons <p><u>Averages from a Grouped Frequency Table</u></p> <ul style="list-style-type: none"> Calculate averages from a grouped frequency table <p><u>Cumulative Frequency and Box Plots</u></p> <p><u>Transformations</u></p> <ul style="list-style-type: none"> Translate a shape on a coordinate grid Use column vectors to describe the translation
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		<ul style="list-style-type: none"> • Missing lengths on similar shapes 	<ul style="list-style-type: none"> • Reflection, rotation, enlargement
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	Year 10 Foundation	Year 11 Foundation
Term 1 & 2	<p>In Year 10, students build on their subject knowledge gained from Key Stage 3 and apply knowledge gained to more complex problems. Students at Yate Academy follow the Edexcel GCSE Mathematics (1MA1) Specification. The specification focuses on three key assessment objectives: mathematical fluency, mathematical reasoning and problem solving. Students will be formally introduced to GCSE exam style questions and will have the opportunity to develop their exam techniques.</p> <p>In terms 1 & 2 students will explore:</p> <p>Integers and Place Value, Decimals, Index Laws, Standard Form, Fractions, Percentages, Growth and Decay, Ratio, Direct and Inverse Proportion.</p>	<p>In Year 11, students will cover the final content necessary for success in GCSE Mathematics, while also having the chance to fully consolidate and deepen their understanding of topics from Key Stage 3 and Year 10. The emphasis will be on reinforcing knowledge through revision and content retrieval, alongside focused exam question practice to refine their exam techniques. Students at Yate Academy follow the Edexcel GCSE Mathematics (1MA1) Specification. The specification focuses on three key assessment objectives: mathematical fluency, mathematical reasoning and problem solving.</p> <p>In terms 1 & 2, students will cover the topics:</p> <p>Primes, Factors, Multiples, Fractions and Mixed Numbers, Real Life Percentages, Order of Operations, Using Index Laws and Standard Form, Decimals, Compound Measures, Ratio and Proportion, Direct and Inverse Proportion</p>

Term 3 & 4	<p>In terms 3 & 4 students will cover the topics:</p> <p>Simplifying Algebraic Expressions, Collecting Like Terms, Expanding and Factorising, Substitution into Expressions and Formula, Solving Multi-Step Linear Equations (unknowns on both sides), Changing the Subject, Solve Linear Simultaneous Equations, Linear Sequences, Plot and Interpret Linear Graphs, Plot and Interpret Quadratic, Cubic and Reciprocal Graphs</p>	<p>In terms 3 & 4, students will cover the topics:</p> <p>Simplifying Algebraic Expressions, Expanding and Factorising, Solving Multi-Step Linear Equations, Changing the Subject, Linear Inequalities, Simultaneous Equations, Linear Sequences, Plot and Interpret Linear Graphs, Angles in Parallel Lines and Polygons, Constructions, Loci, Bearings, Perimeter and Area, Surface Area and Volume, Circles, Pythagoras and Trigonometry, Transformations, Averages</p>
Term 5 & 6	<p>In terms 5 & 6 students will cover the topics:</p> <p>Pythagoras, Trigonometry, Perimeter and Area of Rectangles, Triangles and Trapezia, Area and Perimeter of Parts of a Circle, Surface Area and Volume, Angles in Parallel Lines, Angles in Polygons, Transformations including Enlargements, Interpret Statistical Data by Calculating Averages, Interpret Charts and Graphs including Scatter Graphs, Frequency trees and Probability, Constructions, Loci, Bearings, Similarity and Congruency, Vectors</p>	<p>In term 5 students will cover the topics:</p> <p>Frequency Trees and Probability, Interpreting Charts and Graphs, Similarity and Congruency, Vectors, Compound Measures,</p>

	Year 10 Higher	Year 11 Higher
Term 1 & 2	<p>In Year 10, students build on their subject knowledge gained from Key Stage 3 and apply knowledge gained to more complex problems. Students at Yate Academy follow the Edexcel GCSE Mathematics (1MA1) Specification. The specification focuses on three key assessment objectives: mathematical fluency, mathematical reasoning and problem solving. Students will be formally introduced to GCSE exam style questions and will have the opportunity to develop their exam techniques.</p> <p>In terms 1 & 2 students explore:</p> <p><u>Ratio / Direct and Inverse Proportion</u></p> <ul style="list-style-type: none"> Solve word problems using ratio 	<p>In Year 11, students will cover the final content necessary for success in GCSE Mathematics, while also having the chance to fully consolidate and deepen their understanding of topics from Key Stage 3 and Year 10. The emphasis will be on reinforcing knowledge through revision and content retrieval, alongside focused exam question practice to refine their exam techniques. Students at Yate Academy follow the Edexcel GCSE Mathematics (1MA1) Specification. The specification focuses on three key assessment objectives: mathematical fluency, mathematical reasoning and problem solving.</p> <p>In terms 1 & 2 the focus is on revisiting Algebra topics. Students will</p>

- Multiplicative relationship between two quantities
- Ratio problems using algebra
- Unitary and scalar method for proportion
- Solve problems using direct and inverse proportion

Estimation

- Upper and lower bounds
- Error intervals due to truncation or rounding
- Estimate answers to calculations
- Use one calculation to find the answer to another

Fractions, decimals and percentages

- Recurring decimals into corresponding fractions and back
- Compound interest
- Repeated percentage change (including compound interest)
- Growth and decay problems

Sequences (including Geometric Progressions)

- Recognise and use sequences of triangular, square and cube numbers as well as the Fibonacci Sequence
- Geometric progressions
- Quadratic sequences

Indices & Surds

- Index laws including fractional and negative indices
- Basic surd rules including simplifying
- Multiply two binomials including surds
- Rationalise the denominator

explore:

Equations of straight lines and circles

- Plot and interpret straight line graphs
- Interpret gradients and intercepts of linear functions graphically and algebraically
- Equation of straight line graphs (including parallel and perpendicular)
- Equation of straight line graphs when given the gradient and a point on the line
- Equation of a circle
- Equation of a tangent

Expressions and Equations

- Quadratic graphs (Plot, sketch and interpret)
- Expanding and factorising
- Expand product of two or three binomials
- Completing the square
- Factorising quadratic expressions
- Solving linear equations
- Solving quadratic equations (by factorising, using quadratic formula and completing the square)

Graphs

- Gradients and area under graphs
- Distance-time / Velocity-time

Perpendicular Lines & Equation of Circles

- Identify parallel and perpendicular lines
- Recognise/sketch and interpret graphs of linear/quadratic/cubic functions
- Plot and interpret reciprocal graphs
- Plot and interpret exponential graphs
- Equation of a circle
- Find equation of a tangent to a circle at a given point

Solving Linear and Quadratic Equations

- Solve linear equations
- Solve two linear simultaneous equations
- Solve quadratic equations by factorising
- Solve quadratic equations by rearranging first
- Make connections between graphs and quadratic equations
- Solve quadratic equations using graphs
- Solve quadratic equations using the quadratic formula
- Complete the square, and find turning points

Quadratic Inequalities

- Solve quadratic inequalities where $a=1$
- Solve quadratic inequalities where $a>1$

Further Simultaneous Equations

- Solve linear and nonlinear simultaneous equations

- Cubic, reciprocal and exponential graphs
- Graphs of trigonometric functions

Inequalities and Simultaneous Equations

- Representing inequalities on a number line
- Solving linear inequalities
- Representing inequalities on a coordinate grid
- Solving quadratic inequalities
- Linear simultaneous equations
- Forming and solving linear simultaneous equations
- Solving simultaneous equations graphically
- Non-linear simultaneous equations

Algebraic Fractions

- Adding and subtracting algebraic fractions
- Multiplying and dividing algebraic fractions
- Solving algebraic fractions

Algebraic Manipulation and Proof

- Changing the subject (advanced)
- Substitution into formulae and expressions
- Use algebra to support and construct arguments and proofs

	<p><u>Algebraic Manipulation & Proof</u></p> <ul style="list-style-type: none"> • Changing the subject • Algebraic fractions • Expanding products of two or more binomials • Algebraic proof 	<p><u>Sequences</u></p> <ul style="list-style-type: none"> • Triangular, cube, Fibonacci, Geometric • Generating terms of a sequence • Nth term of linear & quadratic sequences <p><u>Iterative process</u></p> <ul style="list-style-type: none"> • Estimating powers and roots • Iteration to find approximate solutions to linear equations • Iteration to find approximate solutions to quadratic and cubic equations • Iteration with simple converging sequences <p><u>Functions</u></p> <ul style="list-style-type: none"> • Function notation • Composite functions • Inverse functions • Translations and reflections of a function (including trigonometric graphs)
<p>Term 3 & 4</p>	<p>In terms 3 & 4 students will explore:</p> <p><u>Iteration</u></p> <ul style="list-style-type: none"> • Using iteration to find approximate solutions to linear, quadratic and cubic equations. 	<p>In terms 3 & 4 the focus is on Ratio, Number and Geometry and Measure. Students will explore:</p> <p><u>Ratio</u></p> <ul style="list-style-type: none"> • Ratio notation and simplifying ratio • Sharing in a given ratio • Combining ratios

- Using iteration with simple converging sequences

Functions

- Function notation
- Composite functions
- Inverse functions

Gradients and rates of change

- Graphs to solve simple kinematic problems
- Gradient at a point on a curve
- Problems involving gradient of graphs in context

Constructions, Loci and Bearings

- Construct angles and 2D shapes using a ruler, protractor and compasses
- Bisect angles and lines using ruler and compasses
- Interpret scales in real life contexts
- Understand and use bearings including use of angles at parallel lines
- Draw and identify regions bounded by loci

Circle Theorems

- Understand and apply circle theorems to geometrical problems
- Justify solutions to geometrical problems (proof)

Similarity & Congruence

- Ratio 'more-than' problems
- Ratio problems with algebra
- Worded ratio problems

Proportion

- Direct and inverse proportion (Unitary method)
- Direct and inverse proportion (including constant of proportionality)

Rates of change

- Percentage change
- Reverse percentages
- Simple and compound interest
- Growth and decay

Ratio linked to wider topics

- Standard and compound units
- Density
- Pressure
- Speed
- Scale factors and similarity in 2D and 3D

Number 1

- Apply four operations to integers decimals, fractions and mixed numbers
- Recurring decimals to fractions
- Best value

Highest Common Factor and Lowest Common Multiple

- HCF and LCM of two numbers by listing
- Prime factor decomposition and venn diagrams to find HCF & LCM
- Worded problems

- Relationship between lengths, area and volume in similar shapes

Indices and Surds

- Index laws including fractional and negative indices
- Basic surd rules including simplifying, adding, subtracting, multiplying and dividing
- Multiply two binomials involving surds
- Rationalise the denominator

Estimation and bounds

- Upper and lower bounds
- Error intervals due to truncation or rounding
- Estimate answers to calculations
- Use one calculation to find the answer to another

Standard Form

- Write ordinary numbers in standard form and vice versa
- Calculate and interpret standard form
- Solve problems involving standard form

Product Rule for Counting

- Product rule for counting

2D/3D Shapes

- Perimeter and areas of 2D shapes
- Area and perimeter of composite shapes
- Area and circumference of a circle
- Arc lengths and area of sectors
- Volume & surface area of 3D shapes
- Plans and elevations

Angles

- Angle properties of parallel lines
- Interior and exterior angles of regular polygons
- Interior and exterior angles of polygons

		<ul style="list-style-type: none"> • Solve angle problems using equations • Geometrical reasoning <p><u>Transformations</u></p> <ul style="list-style-type: none"> • Translation • Reflection • Rotation • Enlargement <p><u>Similarity and Congruence</u></p> <ul style="list-style-type: none"> • Congruence (including congruent triangles) • Congruence proofs • Relationship between lengths in similar shapes • Relationship between area (and surface area) in similar shapes • Relationship between volume in similar shapes <p><u>Circle Theorems</u></p> <ul style="list-style-type: none"> • Understand and apply circle theorems to geometrical problems • Justify solutions to geometrical problems (proof)
Term 5 & 6	<p><u>Pythagoras and Trigonometry</u></p> <ul style="list-style-type: none"> • 2D Pythagoras • 3D Pythagoras • Right-angled Trigonometry • Non right-angled trigonometry (Sine / Cosine rule) <p><u>Transformations</u></p> <ul style="list-style-type: none"> • Transformations of 2D Shapes (Enlargement, rotation, reflection, translation) 	<p>In term 5, the focus in Geometry and Measure as well as Statistics and Probability. Students will explore:</p> <p><u>2D/3D Pythagoras & Trigonometry</u></p> <ul style="list-style-type: none"> • 2D Pythagoras • 3D Pythagoras • Right-angled Trigonometry • Non right-angled trigonometry (Sine / Cosine rule) • Area of any triangle ($\frac{1}{2}ab\sin C$) • Exact trig values

- Describe single transformations given two congruent 2D shapes
- Find scale factor and centre of enlargement (including fractional and negative scale factors)
- Invariance

Graph Transformations

- Plot, interpret and recognise trigonometric graphs
- Transformation of graphs (including trigonometric graphs)

Probability and Venn Diagrams

- Probability tree diagrams
- Product rule for combined events
- Frequency trees
- Set notation and venn diagrams
- Two-way tables to calculate probabilities
- Product rule for counting

Cumulative frequency & Box plots

- Cumulative frequency tables
- Draw cumulative frequency graphs
- Estimate median, quartiles, interquartile range
- Construct and interpret box plots
- Compare two sets of data

Histograms

- Construct histograms for grouped data with equal / unequal class intervals
- Use histograms to find missing values in frequency table

Vectors

- Understand the concept of a vector
- Know and use different notations for vectors
- Add and subtract vectors
- Multiply vectors by a scalar

- Graphs of trigonometric functions

Constructions, Loci and Bearings

- Construct angles and 2D shapes using a ruler, protractor and compasses
- Bisect angles and lines using ruler and compasses
- Interpret scales in real life contexts
- Understand and use bearings including use of angles at parallel lines
- Draw and identify regions bounded by loci

Vectors

- Understand the concept of a vector
- Know and use different notations for vectors
- Add and subtract vectors
- Multiply vectors by a scalar
- Vector argument
- Vector proof

Cumulative frequency & Box plots

- Cumulative frequency tables
- Draw cumulative frequency graphs
- Estimate median, quartiles, interquartile range
- Construct and interpret box plots
- Compare two sets of data

Histograms

- Construct histograms for grouped data with equal / unequal class intervals
- Use histograms to find missing values in frequency table

- Vector argument
- Vector proof

Frequency Polygons

- Draw and interpret frequency polygons

Scatter Graphs

- Use and interpret scatter graphs of bivariate data
- Recognise types of correlation
- Draw and use lines of best fit to estimate solutions

Sampling

- Understand what is meant by a sample and a population
- Understand how different sample sizes may affect the reliability of conclusions drawn
- Pearson Capture-recapture method

Probability and Venn Diagrams

- Probability tree diagrams
- Product rule for combined events
- Frequency trees
- Set notation and venn diagrams
- Two-way tables to calculate probabilities
- Product rule for counting

A Level Mathematics

	Year 12	Year 13
Term 1 & 2	<p>For A Level Mathematics we follow the Edexcel Specification (9MA0). At the start of Year 12, students will consolidate their knowledge from Key Stage 4, ensuring that they are communicating the maths that they do effectively and thoroughly.</p> <p><u>Algebra</u></p> <p>Algebra and functions</p> <p>Proof</p> <p>Sequences and series</p> <p><u>Geometry</u></p> <p>Co-Ordinate geometry in the (x,y) plane</p> <p>Trigonometry</p> <p>Vectors (2D)</p> <p><u>Calculus</u></p> <p>Differentiation</p>	<p>As pupils move into Year 13, they will start topics with recaps of pre-requisite topics from Year 12, which will allow them to access the new content to further develop their knowledge.</p> <p><u>Calculus</u></p> <p>Further Differentiation</p> <p>Further Integration</p> <p><u>Geometry</u></p> <p>Trigonometry</p> <p>Vectors</p> <p>Coordinate Geometry</p>

<p>Term 3 & 4</p>	<p>As students move through Year 12, they will add extra skills as algebra develops into calculus and will begin to apply their knowledge to real life scenarios.</p> <p><u>Calculus</u></p> <p>Differentiation</p> <p>Exponentials and Logarithms</p> <p>Integration</p> <p><u>Statistics</u></p> <p>Statistical sampling</p> <p>Data presentation and interpretation</p> <p>Probability</p> <p>Statistical distributions</p> <p><u>Mechanics</u></p> <p>Quantities and units in mechanics</p>	<p><u>Calculus</u></p> <p>Numerical methods</p> <p>Further Integration</p> <p><u>Mechanics</u></p> <p>Kinematics</p> <p>Forces and Newton's Laws</p> <p>Moments</p> <p><u>Statistics</u></p> <p>Probability</p> <p>Statistical Distributions</p> <p>Hypothesis testing</p>

	Kinematics (constant acceleration)	
Term 5	<p>Students will continue to apply their knowledge to real life scenarios.</p> <p><u>Statistics</u></p> <p>Statistical hypothesis testing</p> <p><u>Mechanics</u></p> <p>Kinematics</p> <p>Forces & Newton's laws</p>	Exam preparation
Term 6	<p>At the end of Year 12, students will start work on the content that is not on the AS-Level specification. This will lead them to develop their knowledge of the areas they have previously studied in Year 12.</p> <p>Introduction to Year 13 Content</p> <p><u>Algebra</u></p> <p>Algebra and Functions</p>	

	Sequences and Series	
	Proof	

** Due to our new sixth form opening this year, we have changed our A Level Maths Exam Board. Our current Year 13 students are following the AQA specification (7357).

	Year 12	Year 13
Term 1 & 2	<p>At the start of Year 12, students will consolidate their knowledge from Key Stage 4, ensuring that they are communicating the maths that they do effectively and thoroughly.</p> <p><u>Algebra</u></p> <p>Algebra and functions</p> <p>Further Algebra</p> <p><u>Geometry</u></p> <p>Co-Ordinate geometry in the (x,y) plane</p> <p>Trigonometry</p> <p>Vectors (2D)</p>	<p>As pupils move into Year 13, they will start topics with recaps of pre-requisite topics from Year 12, which will allow them to access the new content to further develop their knowledge.</p> <p><u>Algebra</u></p> <p>Proof</p> <p>Series and sequences</p> <p>The binomial theorem</p> <p>Parametric equations</p> <p><u>Calculus</u></p> <p>Further Differentiation</p>

		<p><u>Statistics</u></p> <p>Regression and correlation</p> <p>Further Probability</p> <p>The Normal distribution</p>
<p>Term</p> <p>3 & 4</p>	<p>As students move through Year 12, they will add extra skills as algebra develops into calculus and will begin to apply their knowledge to real life scenarios.</p> <p><u>Calculus</u></p> <p>Differentiation</p> <p>Integration</p> <p><u>Number</u></p> <p>Exponentials and logarithms</p> <p><u>Statistics</u></p> <p>Statistical sampling</p> <p>Data presentation and interpretation</p>	<p><u>Calculus</u></p> <p>Numerical methods</p> <p>Further Integration</p> <p><u>Geometry</u></p> <p>Vectors (3D)</p> <p><u>Mechanics</u></p> <p>Moments</p> <p>Forces at any angle</p> <p>Applications of kinematics</p> <p>Applications of forces</p> <p>Further kinematics</p>

<p>Term 5</p>	<p>Students will continue to apply their knowledge to real life scenarios.</p> <p><u>Statistics</u></p> <p>Probability</p> <p>Statistical distributions</p> <p>Statistical hypothesis testing</p> <p><u>Mechanics</u></p> <p>Quantities and units in mechanics</p> <p>Kinematics 1 (constant acceleration)</p> <p>Forces & Newton's laws</p> <p>Kinematics 2 (variable acceleration)</p>	<p>Exam preparation</p>
<p>Term 6</p>	<p>At the end of Year 12, students will start work on the content that is not on the AS-Level specification. This will lead them to develop their knowledge of the areas they have previously studied in Year 12.</p> <p>Introduction to Year 13 Content</p>	

	<p>Algebra</p> <p>Algebraic and partial fractions</p> <p>Functions and modelling</p> <p>Geometry</p> <p>Trigonometry</p>	
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A Level Further Mathematics

	Year 12	Year 13
Term 1 & 2	<p>At the start of Year 12, students will consolidate their knowledge from Key Stage 4, ensuring that they are communicating the maths that they do effectively and thoroughly.</p> <p><u>Algebra</u></p> <p>Complex Numbers</p> <p>Algebra and Functions</p> <p>Proof</p>	<p><u>Statistics</u></p> <p>Algorithms and Graph Theory</p> <p>Algorithms on Graphs</p> <p>Linear Programming</p> <p>Critical Path Analysis</p> <p><u>Geometry</u></p>

	<p><u>Decision</u></p> <p>Algorithms and Graph Theory</p> <p>Algorithms on Graphs</p> <p>Linear Programming</p> <p>Critical Path Analysis</p>	<p>Polar Co ordinates</p> <p><u>Calculus</u></p> <p>Hyperbolic Functions</p> <p>Further Calculus</p>
<p>Term</p> <p>3 & 4</p>	<p><u>Geometry</u></p> <p>Matrices</p> <p>Vectors</p> <p><u>Algebra</u></p> <p>Proof</p> <p><u>Calculus</u></p> <p>Further Calculus</p> <p><u>Statistics</u></p> <p>Discrete Probability Distributions</p>	<p><u>Calculus</u></p> <p>Further Calculus</p> <p>Differential Equations</p> <p><u>Statistics</u></p> <p>Geometric and Negative Binomial</p> <p>Hypothesis Testing</p> <p>Probability Generating Functions</p>

		Quality of Tests Moments
Term 5	<p>Students will continue to apply their knowledge to real life scenarios.</p> <p><u>Statistics</u></p> <p>Poisson and Binomial Distributions</p> <p>Chi Squared Tests</p>	<p><u>Statistics</u></p> <p>Quality of tests</p> <p>Exam preparation</p>
Term 6	<p>At the end of Year 12, students will start work on the content that is not on the AS-Level specification. This will lead them to develop their knowledge of the areas they have previously studied in Year 12.</p> <p>Introduction to Year 13 Content</p> <p>Algebra</p> <p>Complex Numbers</p> <p>Further Algebra</p>	

Curriculum Impact - How do you know students know more and remember more as a result of your curriculum?

The impact of our curriculum is reflected in our outstanding student outcomes. With a Progress 8 average of +0.86 sustained over the past six years, our students consistently achieve above national expectations. This demonstrates the effectiveness of our structured approach in developing fluency, reasoning, and problem-solving skills. Many of our students choose to continue their mathematical journey at A Level and beyond. This year, Mathematics is the most popular A Level course at Yate Academy, with 32 students opting to study it beyond GCSE. This strong uptake reflects the enthusiasm and aptitude of our students, as well as the effectiveness of our curriculum in fostering a love for mathematics and preparing them for future academic and career opportunities.