

CURRICULUM PLAN

Department: Mathematics

Vision Statement: Our vision is to place students at the heart of everything we do; empowering them to become confident, independent learners with a lifelong appreciation for mathematics. We strive to create a consistent, positive atmosphere that builds numeracy and problem-solving skills, connects mathematics to real-life applications, and prepares every student for further education, employment, and success in a rapidly evolving world.

Strapline: Fostering Focused, Fluent, Future-Facing Mathematicians

Curriculum Story: The curriculum is a spiral starting in Y7 through to Y13 where the level of difficulty in each topic increases covering Number, Algebra, Geometry, Statistics and Proportion.

Skills developed:

Our KS3–KS5 curriculum empowers students with critical thinking, numeracy fluency, and real-world problem-solving skills. Through consistent challenge and support, learners grow into confident, independent mathematicians ready for academic success and future opportunities.

Year 7:

<u>Topics</u>	<u>Why we teach this</u>	<u>Links to last topic</u>	<u>Links to future topics</u>	<u>Key skills developed</u>	<u>Cultural capital opportunities</u>	<u>Links to whole school curriculum</u>
Autumn 1 [						
Unit 2: Number Skills	To consolidate and extend primary understanding, build fluency and accuracy, and prepare students for more abstract mathematical thinking	Links through KS2	Link into KS4	Number and Place Value Written and Mental Methods Number Properties and Factors Positive and Negative Numbers Money and Rounding Time and Measurement Reasoning and Problem Solving	Solving real life problems	Science
Unit 1: Analysing & Displaying Data	To help students collect, represent, and interpret information effectively, develop statistical reasoning, and apply mathematics to real-world contexts.	Links through KS2	Link into KS4	Understanding and Using Averages Interpreting and Presenting Data Comparing and Analysing Data Working with Graphs		Geography Business

Autumn 2						
Unit 3: Expressions, formulae, functions	To help students move from concrete number work to abstract reasoning, develop confidence with mathematical language and notation, and build the foundational skills needed for algebraic manipulation and problem solving	Links to Number topic	Link into KS4	Understanding and Describing Functions Using Symbols and Letters in Algebra Simplifying and Manipulating Algebraic Expressions Substitution and Evaluation	Engineering Industry	DT, Engineering Art Technology
Unit 4: Decimals & Measures	To develop precision, accuracy, and fluency with measurement and decimal concepts. These skills are vital for success across mathematics and in practical, real-world applications.	Links through KS2 and KS3	Link into KS4	Measuring and Drawing Accurately Understanding and Converting Units Working with Decimals		
Spring 1						
Unit 4: Decimals & Measures	To develop precision, accuracy, and fluency with measurement and decimal concepts. These skills are vital for success across mathematics and in practical, real-world applications.	Links through KS2 and KS3	Link into KS4	Applying Measurement to Shapes Problem Solving and Estimation	Finance industry	
Unit 5: Fractions & Percentages	To build fluency, flexibility, and understanding of proportional relationships, linking number work to real-life contexts and laying strong foundations for ratio, proportion, and algebra in KS3	Links through KS2 and KS3	Link into KS4	Understanding Fractions Calculating with Fractions Linking Fractions, Decimals, and Percentages		

				Working with Percentages Applying Understanding		
<u>Spring 2</u>						
Unit 6: Probability	to help students understand and describe uncertainty, connect mathematics to real-life situations, and develop reasoning and analytical skills that support data handling, scientific thinking, and decision making in real life problems	Link to analysing Data topic	Link into KS4	Understanding Probability Concepts Identifying and Calculating Probabilities Working with Experimental Probability Reasoning and Making Conclusions	Insurance Industry	
Unit 7: Ratio & Proportion	To build strong foundations in proportional reasoning, connect number and algebra, and equip students with practical problem-solving skills for real-life contexts and higher-level mathematics.	Link to unit 5 Fraction and Percentage	Link into KS4	Understanding Ratio and Proportion Working with Proportion Calculating and Comparing Proportions Solving Ratio Problems	Recipes	Food Technology
<u>Summer 1</u>						
Unit 8: Lines & Angles	To develop precision, reasoning, and spatial understanding, helping students connect practical measurement with abstract mathematical ideas.	Links through KS2	Link into KS4	Measuring and Drawing Accurately Understanding and Describing Geometric Properties	Construction and Engineering industry	Art Technology

Unit 9 Sequences & Graphs (Book 1)	To help students develop abstract thinking, reasoning skills, and the ability to connect different areas of maths	Links through KS2	Link into KS4	Applying Angle Facts and Rules Problem Solving with Angles Pattern Recognition Rule Application Problem-Solving Algebraic Thinking Coordinate Geometry Skills		Science, Geography
Summer 2						
Unit 9 Sequences & Graphs (Book 1)	To help students develop abstract thinking, reasoning skills, and the ability to connect different areas of maths	Links through KS2	Link into KS4	Graph Interpretation Analytical Skills		Science, Geography
Unit 10: Lines & Angles	Lines and Angles are used heavily in the construction and design industries. Having a good understanding of shape properties can help solve many problems.	Links through KS2	Link into KS4	Shape Recognition and Congruence Transformational Geometry Coordinate Geometry Skills Scale and Enlargement Analytical and Spatial Reasoning	Construction and Engineering industry	

Year 8:						
Topics	Why we teach this	Links to last topic	Links to future topics	Key skills developed	Cultural capital opportunities	Links to whole school curriculum
Autumn 1 [Insert focus of the term here – no more than one line]						
Unit 1: Number Skills	To build a strong foundation in number sense, calculation, and mathematical reasoning. Problem-solving and estimation develop critical thinking, application of skills in real-life contexts, and strategies to check and reason about answers	Links through KS2 and KS3	Link into KS4	Arithmetic and Calculation Skills Number Properties and Factors Powers and Roots Problem-Solving and Estimation	Solving real life problems	Art Technology
Unit 2: Area and volume	To develop practical measurement and spatial reasoning skills, problem-solving in context	Links through KS2 and KS3	Link into KS4	Calculation of Area and Volume 3D Visualization and Representation Unit Conversion and Measurement Problem-Solving in Context	Construction and Engineering industry	
Autumn 2						
Unit 3: Statistics, graphs and charts	To develop skills in interpreting, representing, and analysing data, choosing appropriate methods. These skills prepare students to make solve real-world problems, and	Links through KS2 and KS3	Link into KS4	Data Representation Data Analysis Correlation and Trends Critical Thinking		Business Geography

Unit 4: Expressions and equations	understand patterns in mathematics and everyday contexts. To develop algebraic thinking and problem-solving skills. This builds a foundation for logical reasoning, analytical thinking, and the ability to model real-world situations mathematically,	Links through KS2 and KS3	Link into KS4	Mathematical Calculations Manipulating Algebraic Expressions Understanding Functions Solving Equations Logical and Analytical Thinking		
Spring 1						
Unit 5: Real-life graphs	To develop skills in constructing, reading, and interpreting graphs.	Links through KS3	Link into KS4	Graph Construction Graph Interpretation Problem-Solving with Graphs Analytical Thinking		Geography, Science
Unit 6: Decimals and ratio	To develop numerical fluency and accuracy. To develop skills in ordering and comparing numbers and applying these concepts to real-world problems.	Links through KS2 and KS3	Link into KS4	Decimal Calculation Rounding and Accuracy Ratio and Proportion Ordering and Comparing Problem-Solving Skills	Finance	
Spring 2						
Unit 7: Lines and angles	To develop spatial reasoning and geometric understanding. S also develop geometric reasoning and proof skills.	Links through KS2 and KS3	Link into KS4	Shape Classification and Properties	Construction and Engineering Industry	Art Technology

Unit 8: Calculating with fractions	To develop numerical fluency and understanding of parts of a whole. To ensure students can manipulate fractions confidently in more complex mathematics.	Links through KS2 and KS3	Link into KS4	Angle Understanding and Calculation Geometric Reasoning and Proof Parallel and Intersecting Lines Understanding and Comparing Fractions Operations with Fractions	Finance	
<u>Summer 1</u>						
Unit 8: Calculating with fractions	To develop numerical fluency and understanding of parts of a whole. To ensure students can manipulate fractions confidently in more complex mathematics.	Links through KS2 and KS3	Link into KS4	Reciprocals and Division Problem-Solving Skills	Finance	Geography, Science
Unit 9: Straight-line graphs	To develop understanding of proportional relationships and linear functions and apply it to real-world contexts.	Links through KS3	Link into KS4	Understanding Proportional Relationships Graph Plotting and Interpretation Gradient and Equation of a Line Problem-Solving Using Graphs		
<u>Summer 2</u>						

Unit 10: Percentages, decimals and fractions	To develop fluency with fractions, decimals, and percentages. To develop skills in problem solving.	Links through KS2 and KS3	Link into KS4	Equivalence and Conversion Percentage Calculations Application of Decimals Problem-Solving and Reasoning	Finance	Business
---	--	------------------------------	---------------	---	---------	----------

<u>Year 9:</u>						
<u>Topics</u>	<u>Why we teach this</u>	<u>Links to last topic</u>	<u>Links to future topics</u>	<u>Key skills developed</u>	<u>Cultural capital opportunities</u>	<u>Links to whole school curriculum</u>
<u>Autumn 1</u>						
Number Skills	Reasoning and understanding notation to support the solution of increasingly complex problems	Links through KS2 and KS3	Links into KS4	Calculations with all four operations and negative numbers Using index laws surds and standard form Factors multiples HCF LCM	Solving real life problems	Science
Algebra	Reinforcing and extending the basics of algebraic manipulation	Links through KS2 and KS3	Links into KS4	Simplifying Expanding brackets, factorising solving equations		
<u>Autumn 2</u>						
Graphs Tables and Charts	To allows students time to gather data and information and create their own theories to be tested.	Links through KS2 and KS3	Links into KS4	Drawing and interpreting a range of tables and charts	Finance	Business

Fractions ratio and percentage	Fractions and percentages are among some of the most used maths, from recipes to interest rates.	Links through KS2 and KS3	Links into KS4	Using operations with percentages and fractions converting between fractions decimals and percentages using ratios	Finance	
<u>Spring 1</u>						
Equations and Expressions or Angles Pythagoras and right angled trigonometry	Reinforcing and extending the basics of algebraic manipulation To enable pupil to solve problems in a real-world context using right-angled triangles	Links through KS2 and KS3 Links through KS2 and KS3	Links into KS4 & KS5 Links into KS4 & KS5	Solving different types of equations and inequalities using sequences Solving problems with parallel lines and polygons using Pythagoras and trigonometry with right triangles	Construction and Engineering industry	Technology
<u>Spring 2</u>						
Angles Averages	To help students understand the world around them Data processing and statistics are one of the most used branches of mathematics.	Links through KS2 and KS3	Links into KS4	Properties of shapes angles in parallel lines and triangles angles in polygons Find mean mode median and range from lists and tables Interpret and use averages	Construction and Engineering Industry Insurance Industry	

Graphs	Co-ordinates and graphs form the basis for the analysis of the equation of a straight line.	Links through KS3	Links into KS4 & KS5	Plot draw and interpret linear non linear graphs Draw and Interpret real life graphs		Geography
Summer 1 [Insert focus of the term here – no more than one line]						
Area and Volume	Builds an understanding of shape and space.	Links through KS2 and KS3	Links into KS4	Area of polygons Surface area and volume of 3D shapes Convert between different units Area and circumference of circles and sectors Error intervals and bounds	Construction and Engineering industry	Technology
Transformations and constructions	Builds on earlier understanding of 2d shapes.	Links through KS2 and KS3	Links into KS4	Transform 2D shapes by reflection translation rotation and enlargement Draw plans and elevations of 3d shapes and construct 2d shapes and loci		Art
Summer 2						
Graphs	Co-ordinates and graphs form the basis for the analysis of the equation of a straight line.	Links through KS3	Links into KS4	Plot draw and interpret linear non linear graphs Draw and Interpret real life graphs		

Transformations	Builds on earlier understanding of 2d shapes.	Links through KS2 and KS3	Links into KS4	Transform 2D shapes by reflection translation rotation and enlargement	Insurance Industry	Art
Equations and inequalities	To enable students to solve equations and inequalities	Links through KS2 and KS3	Links into KS4 & KS5	Solve complex inequalities Solve quadratics by factorising completing the square and using the formulae solve simultaneous equations		
Probability	Measure how likely something is to happen so risk can be calculated	Links through KS3	Links into KS4 & KS5	Find probabilities using tables and diagrams Understand mutually exclusive events		

Year 10:

<u>Topics</u>	<u>Why we teach this</u>	<u>Links to last topic</u>	<u>Links to future topics</u>	<u>Key skills developed</u>	<u>Cultural capital opportunities</u>	<u>Links to whole school curriculum</u>
Autumn 1 [Insert focus of the term here – no more than one line]						
Equations and inequalities	To enable students to solve equations and inequalities	Links through KS2 and KS3	Links into KS5	Solve complex inequalities Solve quadratics by factorising completing the square and using the formulae solve simultaneous equations		
Probability	Measure how likely something is to happen so risk can be calculated	Links through KS3	Links into KS5	Find probabilities using tables and diagrams Understand mutually exclusive events	Insurance industry	
Ratio	Reasoning and understanding notation to support the solution of increasingly complex problems	Links through KS2 and KS3		Simplify ratios divide in a ratio solve simple direct and indirect proportion problems	Food Technology / recipes	
Transformations	Builds on earlier understanding of 2d shapes.	Links through KS2 and KS3		Transform 2D shapes by reflection translation rotation and enlargement		Art

<u>Autumn 2</u>	
-----------------	--

Graphs	Co-ordinates and graphs form the basis for the analysis of the equation of a straight line.	Links through KS3	Links into KS5	Plot draw and interpret linear non linear graphs Draw and Interpret real life graphs		
Right angled triangles	To enable pupil to solve problems in a real-world context using right-angled triangles	Links through KS2 and KS3	Links into KS5	Solve problems using Pythagoras and trigonometry	Construction and Engineering Industry	Technology
Multiplicative reasoning	Use of mathematics within a financial context is essential for life beyond school.	Links through KS2 and KS3		Working with Percentages Compound measures and proportion	Finance	Business Science
Similarity and congruence	Extend students' experiences and looks more formally at dealing with topics such as similar triangles	Links through KS2 and KS3	Links into KS5	Using proportion with shapes Using similarity to solve problems with 2D and 3D shapes		
Non right Trigonometry	To enable pupil to solve problems in a real-world context using triangles	Links through KS3	Links into KS5	Solving problems with non-right triangles finding missing sides and angles using the trigonometric formulae	Aerospace and Engineering	

Spring 1

Probability	Measure how likely something is to happen so risk can be calculated	Links through KS3	Links into KS5	Find probabilities using tables and diagrams Understand mutually exclusive events	Insurance	
Multiplicative reasoning	Use of mathematics within a financial context is essential for life beyond school.	Links through KS2 and KS3		Working with Percentages Compound measures and proportion	Finance	
Further statistics	To give the skills to collect, display and interpret data.	Links through KS2 and KS3	Links into KS5	Working with more advanced charts Cumulative frequency box plots and histograms	Finance and data industries	
Equations and graphs	Develop knowledge of non-linear graphs, looking at quadratic, cubic and reciprocal graphs so they recognise different shapes. Graphically, we look at finding the roots of quadratics and revisit algebraic methods.	Links through KS3	Links into KS5	Solving simultaneous equations inequalities and quadratics using graphs Solving equations using iterative processes Expand triple brackets		
<u>Spring 2</u>						
Construction	Builds on earlier understanding of 2d shapes.	Links through KS2 and KS3		Draw plans and elevations of 3d shapes and construct 2d shapes and loci	Architecture Engineering and construction industry	Technology

Circle Theorem		Links through KS2 and KS3	Links into KS5	Solve problems using circle theorem		
Algebra Advanced	Build on study of changing he subject. Reviews solving equations and inequalities before moving on to rearrangement of both familiar and unfamiliar formulae. Higher tier students are introduced to solving equations by iteration	Links through KS3	Links into KS5	Rearranging complex formulae Algebraic fractions Proof and complex surds		Science

Summer 1

Quadratic equations and graphs	Develop knowledge of non-linear graphs, looking at quadratic, cubic and reciprocal graphs so they recognise different shapes. Graphically, we look at finding the roots of quadratics and revisit algebraic methods.	Links through KS3	Links into KS5	Expand solve and factorise quadratics algebraically Use quadratic graphs to find roots and turning points		
Perimeter and area	Develop skills in geometric proof	Links through KS2 and KS3	Links into KS5	Area and circumference of circles and sectors Error intervals Solving problems with 2D and 3D composite shapes	Construction and engineering	Art Technology

Vectors and proof	Make links to prior knowledge of properties of shape and parallel lines	Links through KS3	Links into KS5	To solve geometric problems		Science
Proportion and graphs	Real life graphs are studied, including speed/distance/time construction and interpretation.	Links through KS2 and KS3		To be able to solve proportion problems algebraically To be able to link graphs and proportion		

Summer 2

Fractions and indices	Recognise square and cube numbers. Calculation of indices with any number as the power and to use standard form.	Links through KS2 and KS3	Links into KS5	Calculate with mixed numbers To write and calculate numbers in standard Form		Science
Revise and prepare for mock exams				A range of topics from the last year Interleaved papers		
Feedback from mock exams				Lessons based upon outcomes from mock exam		

Year 11:

[illegible]

Multiplicative Reasoning	Use of mathematics within a financial context is essential for life beyond school.	Links through KS2 and KS3		Working with Percentages Compound measures and proportion	Finance	Business and Science
Further statistics	To give the skills to collect, display and interpret data.	Links through KS2 and KS3	Links into KS5	Working with more advanced charts Cumulative frequency box plots and histograms	Finance and marketing industries	Business science geography
Perimeter and area	Develop skills in geometric proof	Links through KS2 and KS3	Links into KS5	Area and circumference of circles and sectors Error intervals Solving problems with 2D and 3D composite shapes	Construction and engineering	Art Technology
Fractions and indices	Recognise square and cube numbers. Calculation of indices with any number as the power and to use standard form.	Links through KS2 and KS3	Links into KS5	Calculate with mixed numbers To write and calculate numbers in standard Form		Science

Spring 1

Transformations	Builds on earlier understanding of 2d shapes.	Links through KS2 and KS3		Transform 2D shapes by reflection translation rotation and enlargement Draw plans and elevations of 3d shapes and construct 2d shapes and loci		
Equations and graphs	Develop knowledge of non-linear graphs, looking at quadratic, cubic and reciprocal graphs so they recognise different shapes. Graphically, we look at finding the roots of quadratics and revisit algebraic methods.	Links through KS2 and KS3	Links into KS5	Solving simultaneous equations inequalities and quadratics using graphs Solving equations using iterative processes Expand triple brackets		

<u>Spring 2</u>						
Bespoke based upon mock exams						
<u>Summer 1</u>						
Bespoke based upon mock exams						
<u>Summer 2</u>						
N/a						

Year 12 A-Level Mathematics

Term	Topics	Why we teach this	Links to last topic	Links to future topics	Key skills developed	Cultural capital opportunities	Links to whole school curriculum
Autumn 1	Algebra & Functions (quadratics, factor theorem, functions, transformations)	Algebra is foundational for all areas of mathematics; functions underpin calculus, mechanics, and statistics.	Builds on GCSE algebra: solving equations, manipulating expressions.	Essential for differentiation, integration, and solving equations in Mechanics and Statistics.	Manipulating expressions, solving complex equations, understanding function behavior, graphical interpretation.	Real-world modelling workshops, coding with functions in Python or Excel to solve problems.	Logical reasoning and problem-solving transferable to sciences and computing.
	Coordinate Geometry (lines, circles, intersections)	Introduces methods for analysing geometric relationships algebraically.	Builds on GCSE coordinate geometry.	Leads into calculus (gradients, tangents) and Mechanics (motion along a line, forces).	Analytical geometry, proof techniques, problem-solving with algebra and graphs.	Use of dynamic geometry software (Desmos, GeoGebra) for visualisation.	Links to physics (vectors, trajectories), computer science (graphics), engineering.
	Sequences & Series (arithmetic, geometric, sigma notation)	Key tool for modelling growth, patterns, and sums in real-world contexts.	Builds on GCSE sequences and series.	Prepares for calculus (limits, summation of series, convergence) and Statistics (probability distributions).	Pattern recognition, summation, derivation of formulas, mathematical proof.	Applications in finance (compound interest), biology (population growth), economics.	Links to numeracy, computing, and economics (modelling real-world trends).

Autumn 2	Differentiation (basic rules, tangents, stationary points, optimization)	Introduces rates of change, which are essential in calculus, physics, and engineering.	Builds on algebra, functions, and coordinate geometry.	Prepares for integration and Mechanics (velocity, acceleration, motion problems).	Calculus techniques, problem-solving, graphical interpretation, real-world modelling.	Practical examples: motion, growth/decay, optimisation problems in industry and nature.	Links to physics (kinematics), economics (max/min problems), computing (simulation).
	Integration (indefinite, definite, area under curve)	Provides tools to calculate accumulations, areas, and totals from rates of change.	Builds on differentiation.	Leads to Mechanics (displacement from velocity) and Statistics (area under probability density functions).	Calculus techniques, algebraic manipulation, numerical approximation, problem-solving.	Modelling real-world processes, e.g., population growth, work done in physics.	Links to science, economics, engineering, and data interpretation.
Spring 1	Vectors in 2D & 3D	Provides spatial reasoning skills; essential for mechanics and physics.	Builds on coordinate geometry and algebra.	Leads into Mechanics (forces, motion along lines, equilibrium).	Vector algebra, magnitude/direction calculations, scalar and vector products, geometric interpretation.	Engineering/architecture examples, computer graphics, navigation.	Links to physics, computing, and engineering.
	Mechanics – Kinematics (M1)	Applies mathematics to motion problems: displacement, velocity, acceleration.	Builds on differentiation and vectors.	Leads to dynamics (forces) in Mechanics M1.	Modelling motion, calculus application, problem-solving, interpreting graphs.	Simulations of motion, real-world physics applications (sports, vehicles).	Links to physics, engineering, sports science.

Spring 2	Mechanics – Forces & Newton’s Laws (M1)	Introduces forces, equilibrium, and Newton’s laws in mathematical form.	Builds on vectors and kinematics.	Leads to further Mechanics problems in Year 13 (energy, circular motion).	Analytical problem-solving, vector resolution, applying calculus in dynamics.	Physics experiments: pulleys, projectiles, engineering structures.	Links to physics, engineering, robotics.
	Statistics – Probability & Distributions (S1)	Fundamental for modelling uncertainty and data analysis.	Builds on sequences, series, and functions.	Leads to hypothesis testing, statistical inference, and S2 content in Year 13.	Probability calculations, combinatorics, expected value, variance, modelling with distributions.	Applications in finance, AI, epidemiology, risk assessment.	Links to science, economics, computing, social sciences.
Summer 1	Statistics – Binomial & Normal Distributions (S1)	Introduces discrete and continuous probability models for real-world data.	Builds on probability foundations.	Prepares for inferential statistics in Year 13.	Calculating probabilities, using formulae and tables, applying approximation techniques.	Real-world modelling: polling data, quality control, genetics.	Links to biology, economics, psychology, and social sciences.
	Revision & Problem Solving	Consolidates knowledge from Autumn and Spring terms; develops exam skills.	All previous topics.	Essential foundation for Year 13 A-Level Maths.	Exam techniques, multi-step problem-solving, logical reasoning, proof writing.	Participation in maths competitions, enrichment challenges.	Cross-curricular numeracy, logical reasoning, resilience, critical thinking.

Summer 2 **Applied Problem Solving /** Encourages application of mathematical Builds on all prior topics. Bridges Year 12 to Year 13

**Enrichment
Projects**

knowledge to
complex real-
world contexts.

advanced
content.

Year 13

Term	Topics	Why we teach this	Links to last topic	Links to future topics	Key skills developed	Cultural capital opportunities	Links to whole school curriculum
Autumn 1	Algebra & Functions – Advanced (polynomials, partial fractions, parametric equations)	Builds deeper understanding of functions, essential for calculus and mechanics.	Builds on Year 12 algebra, sequences, and functions.	Leads into C3 calculus and differential equations.	Manipulating complex expressions, solving higher-degree equations, parametric graphing.	Mathematical modelling competitions, coding simulations.	Develops logical reasoning, problem-solving, numeracy.
	C3 – Differentiation & Integration (advanced techniques, chain,	Extends calculus skills for complex applications in	Builds on Year 12 differentiation and integration.	Leads into C4 topics, M2 (forces, energy), and S2	Advanced calculus, solving applied problems,	Real-world physics applications,	Links to physics, engineering, economics.

	product, quotient, integration by parts)	mechanics and statistics.		(continuous distributions).	optimisation, approximation.	financial modelling.	
	Vectors in 3D & Geometry	Provides spatial reasoning for 3D mechanics.	Builds on Year 12 vectors.	Leads into M2 mechanics (forces, circular motion).	Vector algebra, 3D geometric visualization, scalar and vector products.	Engineering, architecture, computer graphics.	Links to physics, engineering, design, computing.
Autumn 2	C3 – Further Calculus & Differential Equations	Solve differential equations, model real-world rates of change.	Builds on C3 calculus and Year 12 differentiation/integration.	Leads to C4 and applied mechanics M2.	Modelling, calculus, problem-solving, analytical reasoning.	Real-world physics and biology modelling (population growth, decay).	Links to physics, biology, economics, engineering.
	Statistics – S2 Foundations (correlation, regression, hypothesis testing basics)	Introduces statistical modelling and inference for real-world data.	Builds on S1 probability and distributions.	Leads to full S2 hypothesis testing and estimation.	Data analysis, interpretation, probability calculations, critical reasoning.	Real-life data projects, surveys, data science examples.	Links to science, economics, social sciences.
Spring 1	C4 – Advanced Calculus & Algebra (complex numbers, roots of polynomials, advanced integration techniques)	Deepens problem-solving skills and prepares for complex applied maths.	Builds on C3 differentiation/integration and algebra.	Leads to applied mechanics M2 and problem-solving tasks.	Complex number manipulation, advanced integration, solving higher-order equations.	Applied engineering challenges, STEM problem-solving competitions.	Links to computing, physics, engineering.

	M2 – Momentum, Work, Energy, Circular Motion	Applies calculus and vectors to mechanics problems in real-world contexts.	Builds on Year 12 M1 (forces, kinematics) and vectors.	Leads to further dynamics and optional modules (Year 13).	Modelling, analytical problem-solving, vector resolution, calculus applications.	Physics lab experiments, sports mechanics, engineering applications.	Links to physics, engineering, sports science.
Spring 2	Statistics – S2 Hypothesis Testing & Probability	Enables students to make inferences and predictions based on data.	Builds on S2 foundations and S1 distributions.	Leads to applied data analysis projects and Year 13 exams.	Hypothesis testing, statistical inference, probability calculations, regression analysis.	Data modelling, finance, epidemiology, AI examples.	Links to biology, economics, social sciences, computing.
	Revision & Problem Solving	Consolidates Year 13 content, exam preparation.	Builds on all prior topics.	Prepares for final A-Level exams.	Multi-step problem-solving, exam techniques, proof writing, modelling.	Maths competitions, enrichment, STEM challenges.	Cross-curricular numeracy, logical reasoning, resilience.
Summer 1	Applied Project / Enrichment	Apply mathematical knowledge to real-world scenarios, independent research.	Builds on all Year 13 topics.	Bridges to university-level maths and applied STEM studies.	Modelling, teamwork, independent research, communication.	STEM competitions, real-world projects, coding simulations, industry links.	Links to STEM subjects, economics, computing, leadership.
Summer 2	Further Problem Solving & Extension Topics (optional, e.g., matrices, further vectors)	Stretch and challenge students, prepare for university courses.	Builds on C4, M2, S2 knowledge.	Leads to preparation for undergraduate maths and engineering.	Problem-solving, critical thinking, independent exploration.	Competitions, enrichment programs, STEM fairs.	Links to physics, computing, engineering, economics.

Appendix A: Whole-school Curriculum Vision

OUR CURRICULUM VISION

Colton Hills Community School is an inner-city school with a diverse cohort that draws from a wide range of cultures, nationalities and identities. A significant majority of our students come from working class backgrounds, and many from households where resources can be scarce and access to cultural capital is limited. Our school proudly holds the status of a School of Sanctuary, where students from across the local area – and across the globe, too – can come together to learn harmoniously regardless of their background and upbringing. We are aware of the challenges of our students' lives, but do not use them as an excuse.

Therefore, the intention of our curriculum is that we will offer our students the access to a broad and varied curriculum that seeks to equip them for modern life. We intend it to be knowledge-rich, deep in its explorations of topics, challenging in its delivery and with a distinctive, outward-looking, international feel. We recognised the importance of grounding our curriculum in its wider contexts to enable us to fill gaps in our students' knowledge that they may have when compared to students from more affluent backgrounds, and we are unapologetic in ensuring that our students have every opportunity to engage with as much powerful knowledge as those more fortunate than they are.

With these school contexts in mind, at Colton Hills we have built our curriculum around a series of thematically based Curricular Concepts that students will see in various subjects, enabling them to draw links and supporting them in making connections that might not always be apparent to them.

The intention of our curriculum at all stages is that we will teach all children at the school that:

- 1 – Humanity is on an optimistic, positive journey of developing tolerance, enfranchisement and rights for all peoples, and we must all play our part in this (SOCIAL JUSTICE)**
- 2 – Diversity is a gift to be valued, one that enriches our school, and that the shared histories of all cultures are worthy of respect and understanding (CULTURAL DIVERSITY)**
- 3 – Respect for the law, democracy and its institutions are vital, but that existing power structures should always be respectfully questioned (CIVIC RESPONSIBILITY)**
- 4 – Technological development is full of great human achievement, but is not without its challenges and drawbacks of which we must always be aware (TECHNOLOGICAL PROGRESS)**
- 5 – The natural world is a place of wonder, mystery and beauty that should be respected, revered and protected, particularly in the face of climate change (PRECIOUS PLANET)**
- 6 – Our health – mentally, physically and spiritually – is of primary importance and must be preserved as it contributes immensely to a happy and productive life (HEALTHY LIVING)**
- 7 – Being enterprising and financially independent is crucial, but making money should always be weighed against the moral decisions about who it might affect (ETHICAL ENTERPRISE)**

8 – An appreciation of the vast array of creative arts and their power to entertain and educate is vital in an enriched, meaningful and fulfilled life (ARTISTIC CREATIVITY)

Students who leave school with wider awareness of the world around them, with self-respect and with a personal morality will be best able to take advantage of all that life offers, and find their place in the world as a citizen of all of their communities.