

# Mathematics

**“If Mathematics is to be understood widely,  
we need to emphasise its elegance and application” Johnny Ball**

## Summerhill students will be **valuable members of society**

Mathematical students will demonstrate a deep understanding of the curriculum. This is complemented by a spiral curriculum which regularly explores and builds upon embedded key skills. These key skills can be applied by students to real world situations.

We believe it is essential that students develop their mathematical understanding in and outside the classroom. For this to happen, students should question, explore, and wonder about the mathematical world they live in

## Summerhill students will be **skilled communicators**

Students will be resilient learners where problem solving is integral to Mathematics and our curriculum provides all students with the opportunity to delve into these skills.

Students can communicate, justify, argue, and prove using mathematical vocabulary.

Students will be able to follow a line of enquiry, form relationships and generalisations, discuss with confidence, proof, and evidence their findings.

## Summerhill students will be **knowledgeable**

Students will experience a curriculum which is rich in skills and knowledge, igniting passion and curiosity.

Every student is entitled to become fluent in the fundamental content for their age whilst receiving the relevant challenge and support needed.

We build our cultural capital through experiences such as Pi Day where students are able to explore Pi, its origin, application and impact on modern day life.

## **Our curriculum is underpinned by four key values:**

- Courage** – doing what is right; being truthful; trying new experiences; taking risks in the pursuit of personal development
- Ambition** – having the highest aspirations and expectations of ourselves / others; being brilliant in all we do; having belief that challenges can be overcome with the right attitude and hard work
- Respect** – thinking about the way we interact with others; being considerate to ourselves, others and the environment; responding to expectations and working together in teams
- Effort** – investing time and energy to achieve success; always giving our best in everything we do; demonstrating resilience

# MATHS

Year	Key Features	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
7	<p>All students</p> <p>5 periods per week</p> <p>A mastery approach delving deeper into topics Extension topics provided for each area</p>	<p><u>Number:</u> Place Value, Rounding, Estimation</p> <p><u>Number:</u> Addition and subtraction, Perimeter</p>	<p><u>Number:</u> Multiplying and dividing, Area of shapes, Calculate the mean, Factors, HCF Multiples</p> <p><b>Christmas project – Love your calculator</b></p>	<p><u>Number:</u> Fractions, On a number line, One quantity as a fraction of another, Equivalent fractions, Compare and order, Mixed and improper, Add and subtract, Fractions of an amount</p>	<p><u>Statistics:</u> Percentages, Types of data, Collecting and organising data, Averages and range, Grouped data</p> <p><u>Number:</u> Negative Numbers, 4 operations, Order of operations Indices</p>	<p><u>Algebra:</u> Order of operations, Substitution, Simplifying algebraic expressions, Solving equations</p>	<p><u>Geometry and measures:</u> Shapes Draw, measure and name angles, Find unknown angles, Properties of triangles and quadrilaterals</p>
8	<p>All students</p> <p>4 periods per week</p> <p>A mastery approach delving deeper into topics Extension topics provided for each area</p>	<p><u>Number:</u> Fractions, Fractional increase and decrease</p> <p><u>Number:</u> Percentages, Percentage change Pie charts Bar charts</p>	<p><u>Data:</u> Probability, Sample spaces</p> <p><u>Geometry:</u> Angles Shape properties Transformations – Translations, rotations, reflections, enlargements</p> <p><b>Christmas project - Love your calculator</b></p>	<p><u>Algebra:</u> Calculations with 4 operations, Roots, reciprocals, Substitution, Simplifying, Linear equations, Linear sequences, Inequalities, Rearranging</p>	<p><u>Geometry:</u> Circles and Area, Trapeziums, Unit conversions</p>	<p><u>Ratio and Proportion:</u> Share in a ratio, Compound units, DST, MDV, Direct and Inverse proportion, Recipe problems, Gradients of graphs, Pie charts, Scaling and multipliers</p>	<p><u>Statistics:</u> Scatter graphs, Frequency polygons</p> <p><u>Geometry:</u> 3D Shapes, Unit conversions, Volume and surface area, Plans and elevations</p>

Year	Key Features	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
9	<p>All students</p> <p>5 periods per week The depth of content covered depends upon whether students are <b>forecast</b> to take the Foundation or Higher course</p>	<p><u>Number Systems and Calculations:</u> Rounding Indices, roots reciprocals BIDMAS Factors, multiples, primes Standard form</p>	<p><u>Introduction to Algebra:</u> Expressions Substitution Expanding and factorising Equations Sequences and inequalities Simple proof</p> <p><b>Christmas project - Love your calculator</b></p>	<p><u>Data Collection and Analysis:</u> Averages and range Representing and interpreting data</p> <p><u>Fractions and Percentages:</u> Fractions and % Ratio and proportion</p>	<p><u>Equations and Inequalities:</u> Equations and inequalities, Sequences</p> <p><u>Polygons and Angles:</u> Properties of shapes, parallel lines, Polygons Pythagoras Theorem Trigonometry</p>	<p><u>Statistics:</u> Sampling, Averages and Range</p> <p><u>Perimeter, Area and Volume:</u> Perimeter, area and circles, 3D shapes, Accuracy and bounds</p>	<p><u>Real life and Linear Graphs:</u> Real life graphs, Straight line graphs Linear graphs and coordinate geometry, Quadratic cubic and other graphs</p>
10 GCSE	<p>All students</p> <p>5 periods per week</p> <p>The depth of content covered depends upon whether students take the Foundation or Higher course</p> <p>GCSE Mathematics (Edexcel 1MA1)</p>	<p><u>Ratio and Proportion:</u> Write as a fraction, Better buys, Currency conversions, Inverse and direct proportion Loci, bearings</p> <p><u>Right Angled Triangles (F):</u> Pythagoras Trigonometry</p> <p><u>Further Equations (H):</u> Quadratic and simultaneous, Inequalities</p>	<p><u>Probability (F):</u> Sample spaces, Expected outcomes, Tree diagrams, Sets and Venn diagrams</p> <p><u>Multiplicative Reasoning (F&amp;H):</u> Direct and inverse proportion, Compound measures, Compound interest, Iteration</p> <p><u>Transformations (F&amp;H)</u> Transformations, Constructions, Loci, Bearings</p>	<p><u>Data Displays, Collecting Data (H):</u> Cumulative frequency, box plots and histograms</p> <p><u>3D Shapes and Similarity (H):</u> Similarity and congruence in 2D and 3D</p> <p><u>Constructions (F):</u> Triangles, Nets, Plans and elevations, Bearings</p>	<p><u>Trigonometry (H):</u> Graphs of trigonometric functions, Sine and cosine rules</p> <p><u>Probability (H):</u> Sample spaces, Expected outcomes, Tree diagrams, Sets and Venn diagrams</p> <p><u>Quadratics (F):</u> Expanding, Factorising, Graphs</p> <p><u>Perimeter, Area and Volume (F):</u> Circles, Cylinders, Cones and spheres</p>	<p><u>Circles (H):</u> Circle Theorems, Circle geometry</p> <p><u>Quadratics (H):</u> Expanding more than two brackets, Sketching graphs Graph of circles, cubes and quadratic</p> <p><u>Vectors (F):</u> Congruence, Similarity in 2D Vectors</p>	<p><u>Vectors (H):</u> Vectors and geometric proofs</p> <p><u>Functions (F&amp;H):</u> Area under the graph, Rates of change in graphs, Transformations of graphs Rearranging equations, Graphs of reciprocal functions, cubic and simultaneous equations</p>

Year	Key Features	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
11 GCSE	<p>All students</p> <p>4 periods per week</p> <p>The depth of content covered depends upon whether students take the Foundation or Higher course</p> <p>GCSE Mathematics (Edexcel 1MA1)</p>	<p>Pythagoras, Ratio and proportion, Probability, trigonometry, sine cosine, area of triangle Histograms, box plots</p>	<p>Perimeter, area, volume, surface area Expanding, factorising, Quadratics, Angles, Circle theorems,</p>	<p>Types of chart, Averages from a table, Angles, Straight line graphs, Probability, Interest, Vectors, Graph transformations</p>	<p>Functions, Perimeter, Area, Volume, Surds, Sequences, Interest and depreciation</p>		