Holmer Green Senior School

Work Hard, Be Kind, Have Passion

**SUBJECT Mathematics – Key Stage 3**

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| Year 7 | Area of Study:<br><br>Data and Number Skills | Area of Study:<br><br>Algebra, Decimals and measures | Area of Study:<br><br>Fractions, and Percentages | Area of Study:<br><br>Probability, Ratio, and Proportion | Area of Study:<br><br>Lines and Angles | Area of Study:<br><br>Sequences, Graphs, and Transformations |
| | Content:<br><br>Mead, Median, Mode, and Range; Displaying Data; Averages and Comparing Data; Number Skills | Content:<br><br>Simplifying and Writing Expressions; Functions; Substitution in to Formulae; Decimals and Rounding; Scales and Measures; Perimeter and Area | Content:<br><br>Working with Fractions; Fractions and Decimals; Percentages of Amounts | Content:<br><br>Calculating Probability; Expected Outcomes; Writing and Using Ratios; Ratios, Fractions, Proportions, and Percentages | Content:<br><br>Measuring and Drawing Angles; Angles in Triangles and Quadrilaterals | Content:<br><br>Sequences and Patterns; Extending Sequences, Position to Term Rules, Straight Line Graphs; Enlargement; Symmetry; Reflection; Rotation; Translation |

| | |
|---|---|
| **Support at home** | Corbettmaths website with videos and worksheets.<br>https://corbettmaths.com/<br>Dr Frost<br>https://www.drfrostmaths.com/<br>Book<br>Maths Progress Purposeful Practice Book 1 |

| **Assessments:** | **Careers in the Curriculum:** |
|---|---|
| AP1: Data, Number Skills, Algebra, and Decimals | • **Administrative work with figures** - in all organisations, ranging from local authorities to manufacturers - perhaps working in payroll or accounts.<br>• **Financial services** - banking, building society work, insurance and pensions<br>• **Management** - e.g. to work out budgets or analyse performance figures |

| | |
|---|---|
| AP2: Measures, Fractions, Percentages, Probability, Ratio, and Proportion<br><br>AP3: End of year 7 exam. Covers all content covered throughout the year. | • **Market research** - often involves quantitative research to work out customers' wants and needs<br>• **Quantity surveying** - working out costs for major building projects.<br>• **Purchasing** - buying goods or raw materials for an organisation, at the best possible price.<br>• **Logistics** - working out the most efficient way to move goods and people around. |

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

**SUBJECT Mathematics – Key Stage 3**

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| Year 8 | Area of Study:<br><br>Number, Area and Volume | Area of Study:<br><br>Statistics, Graphs and Charts | Area of Study:<br><br>Expressions and Equations | Area of Study:<br><br>Real-Life Graphs, Decimals and Ratio | Area of Study:<br><br>Angles and Fractions | Area of Study:<br><br>Straight Line Graphs, Percentages, Decimals, and Fractions |
| | Content:<br><br>Calculations with Positive and Negative Integers; Powers and Roots; Area of Triangles, Parallelograms, and Trapeziums; Volume of Cubes and Cuboids; Surface Area of Cubes and Cuboids and Measures | Content:<br><br>Pie Charts; Tables; Stem and Leaf Diagrams; Scatter Graphs; Comparing Data | Content:<br><br>Expressions; Brackets; Factorising Expressions; Solving Equations | Content:<br><br>Conversion Graphs; Distance-Time Graphs; Line Graphs; Real-Life Graphs; Curved Graphs; Ordering Decimals; Rounding; Calculations with Decimals; Ratio and Proportion with Decimals. | Content:<br><br>Angles in Quadrilaterals, Angles in Parallel Lines; Interior and Exterior Angles; Solving Geometric Problems; Ordering Fractions; Operations with Fractions and Mixed Numbers | Content:<br><br>Direct Proportions on Graphs; Gradient; Equations of Straight Lines; Fraction, Decimal, and Percentage Equivalence; Percentages of Amounts |

| | |
|---|---|
| **Support at home** | Corbettmaths website with videos and worksheets.<br>https://corbettmaths.com/<br>Dr Frost<br>https://www.drfrostmaths.com/<br>Book<br>Maths Progress Purposeful Practice Book 2 |

| **Assessments:** | **Careers in the Curriculum:** |
|---|---|
| AP1: Number, Area, Volume, Statistics, Graphs, and Charts<br><br>AP2: Expressions, Equations, Real-Life Graphs, Decimals, Ratio, and Angles | • **Administrative work with figures** - in all organisations, ranging from local authorities to manufacturers - perhaps working in payroll or accounts.<br>• **Financial services** - banking, building society work, insurance and pensions<br>• **Management** - e.g. to work out budgets or analyse performance figures |

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

| | |
|---|---|
| AP3: End of year 8 exam. Covers all content covered throughout the year. | • **Market research** - often involves quantitative research to work out customers' wants and needs<br>• **Quantity surveying** - working out costs for major building projects.<br>• **Purchasing** - buying goods or raw materials for an organisation, at the best possible price.<br>• **Logistics** - working out the most efficient way to move goods and people around. |

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

**SUBJECT Mathematics – Key Stage 3**

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| Year 9 | Area of Study:<br><br>Indices, Standard Form, Expressions, and Formulae | Area of Study:<br><br>Dealing with Data | Area of Study:<br><br>Multiplicative Reasoning and Constructions | Area of Study:<br><br>Sequences, Inequalities, equations and proportion | Area of Study:<br><br>Equations, Circles, and Pythagoras Bounds and Graphs | Area of Study:<br><br>Probability, and Comparing Shapes |
| | Content:<br><br>Indices; Standard Form; Estimates; Solving Equations; Substitution; Writing; Rearranging Formulae; Index Laws and Expanding Double Brackets | Content:<br><br>Collecting Data; Calculating Averages; Analysing and Comparing Data | Content:<br><br>Enlargement; Percentage Change; Compound Measures; Direct and Inverse Proportion; Constructions and Scale Diagrams | Content:<br><br>Arithmetic Sequences; Non-Linear Sequences; Inequalities and Solving Equations; | Content:<br><br>Circumference; Area of Circles; Pythagoras' Theorem Errors and Bounds; Straight Line Graphs; Simultaneous Equations and Non-Linear Graphs | Content:<br><br>Mutually Exclusive Events, Sample Space Diagrams; Venn Diagrams; Congruent and Similar Shapes and Right-Angled Trigonometry |

| | |
|---|---|
| **Support at home** | Corbettmaths website with videos and worksheets.<br>https://corbettmaths.com/<br>Dr Frost<br>https://www.drfrostmaths.com/<br>Book<br>Maths Progress Purposeful Practice Book 3 |

| **Assessments:** | **Careers in the Curriculum:** |
|---|---|
| AP1: Indices, Standard Form, Expressions, Formulae, and Data<br><br>AP2: Multiplicative Reasoning, Constructions, Sequences, Inequalities, Equations, Circles, and Pythagoras | • **Accountancy** - recording and analysing financial information for individuals, companies, public sector organisations etc<br>• **Architecture** - combines a flair for design with mathematical skills.<br>• **Broking and trading** - buying and selling stocks, shares, bonds and commodities.<br>• **Computing** - e.g. working in software development or systems analysis<br>• **Financial advice work** - advising people about their personal finances. |

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

| | |
|---|---|
| AP3: End of year 9 exam. Covers all content covered throughout the year. | • **Medical and healthcare work** - many careers in these areas require an ability with clinical measurements, interpreting figures etc. There are also various jobs in health informatics that are concerned with the collection, management, use and sharing of information, in order to improve healthcare. |

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

**SUBJECT Mathematics – Key Stage 4**

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| Year 10 Higher | Area of Study: Numbers; Algebra; Interpreting and representing data | Area of Study: Fractions, ratio and percentages; Angles and trigonometry | Area of Study: Graphs; Area and volume | Area of Study: Transformations and constructions; Equations and inequalities | Area of Study: Probability; Multiplicative reasoning; Similarity and Congruence | Area of Study: Advance Trigonometry and Advance Statistics |
| | Content:<br><br>Number problems and reasoning; Place value and estimating; HCF and LCM; Calculating with powers (Indices); Zero, negative and fractional indices; Powers of 10 and standard form; Surds.<br><br>Algebraic indices; Expanding and factorising; Equations; Formulae; Linear and Non-linear sequences.<br><br>Statistical diagrams; | Content:<br><br>Fractions; Ratios and proportion; Fractions, decimals and percentages.<br><br>Angles properties of triangles and quadrilaterals; Interior and exterior angles of a polygon; Pythagoras Theorem; Trigonometry. | Content:<br><br>Linear graphs; Graphing rates of change; Real-life graphs; Line segments; Quadratic graphs; Cubic and reciprocal graphs<br><br>Perimeter and area; Units and accuracy; Prisms; Circles; Sectors of circles; Cylinders and spheres; Pyramids and cones. | Content:<br><br>Plans and elevations of 3D solids, Transformations of 2D Shapes, Scale drawings, calculation of bearings, Constructions of 2D shapes, and Loci.<br><br>Solving linear inequalities, solving quadratic equations, completing the square and simultaneous equations. | Content:<br><br>Calculation of probability with combined events and mutually exclusive events; independent events, conditional probability and probability in tree and Venn diagrams.<br><br>Growth and decay, compound measures (Speed, density and pressure.<br><br>Geometric proof with congruence and similarity, similarity | Content:<br><br>Accuracy and error intervals, graphs of the trigonometric ratios Sine, Cosine and Tangent, Sine rule, Cosine rule, solving 2D trigonometric problems involving bearings, and solving problems in 3D through Pythagoras and trigonometry.<br><br>Sampling, capture/re-capture method, cumulative frequency diagrams, box plots, drawing and interpreting histograms, comparing |

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

| | | | | | | |
|---|---|---|---|---|---|---|
| | Scatter graphs; Line of best fit; Averages and range. | | | | problems with length, area and volume. | and describing distributions. |

| **Support at home** | Websites:<br>• Corbettmaths: https://corbettmaths.com/<br>• Maths Genie GCSE Revision: https://www.mathsgenie.co.uk/gcse.html<br>• Dr Frost: https://www.drfrostmaths.com/ | Physical resources:<br>• Mathematics: Purposeful Practice Book – Higher<br>• GCSE Maths Edexcel Exam Practice Workbook: Higher - for the Grade 9-1 Course<br>• GCSE (9-1) Maths Higher Revision Flashcards |
|---|---|---|

**Assessments:**

AP1: Numbers; Algebra; Interpreting and representing data; Fractions, ratio and percentages; Angles and trigonometry.

AP2: Graphs; Area and volume; Transformations and constructions; Equations and inequalities.

AP3: End of the year 10 exam. GCSE paper without the year 11 content. It will condition the new sets in year 11.

**Careers in the Curriculum:**

- **Administrative work with figures** - in all organisations, ranging from local authorities to manufacturers - perhaps working in payroll or accounts.
- **Financial services** - banking, building society work, insurance and pensions
- **Management** - e.g. to work out budgets or analyse performance figures
- **Market research** - often involves quantitative research to work out customers' wants and needs
- **Quantity surveying** - working out costs for major building projects.
- **Purchasing** - buying goods or raw materials for an organisation, at the best possible price.
- **Logistics** - working out the most efficient way to move goods and people around.

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

**SUBJECT Mathematics – Key Stage 4**

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| Year 10 Foundation | Area of Study: Numbers; Algebra; Graphs, tables and charts | Area of Study: Fractions and percentages; Equations, inequalities and sequences | Area of Study: Angles; averages and range | Area of Study: Perimeter; area and volume; Graphs | Area of Study: Transformations; Ratio and proportion | Area of Study: Right-angle triangles; Probability and Multiplicative reasoning |
| | Content:<br><br>Calculations; Decimal numbers; Place value; Factors and multiples; Squares, cubes and roots; Index notation and Prime factors.<br><br>Algebraic expressions; Simplifying expressions; Substitution; Formulae; Expanding brackets and Factorising.<br><br>Frequency tables; Two-way tables; Representing data; Time series; Stem and leaf diagrams; Pie Charts; Scatter graphs and Line of best fit. | Content:<br><br>Operations with fractions (add, subtract, multiply and divide); Fractions and decimals; Fractions and percentages; Calculating percentages; Simple interest and Multiplier<br><br>Solving equations; Inequalities; Using formulae; Generating sequences and Using the nth term of a sequence. | Content:<br><br>Properties of shapes; Angles in parallel lines; Angles in triangles; Exterior and interior angles of polygons and Geometrical problems.<br><br>Mode, median, Mean and range; Types of average; Estimating the mean from a frequency table and Sampling. | Content:<br><br>Properties and area of basic 2D shapes, area of compound shapes, surface area of 3D solids and volume of prisms.<br><br>Coordinates, gradient, equation of the straight-line y=mx+c, distance-time graphs and real-life graphs. | Content:<br><br>Transformations (Translation, rotation, reflection and enlargement) and describing transformations.<br><br>Writing and using ratios, ratios and measures, comparing using ratios, using proportion and graphs. | Content:<br><br>Pythagoras theorem, trigonometry ratios (Sine, Cosine and Tangent), Finding lengths and angles in triangles using trigonometry.<br><br>Calculating probability, experimental probability, calculating probability through tree and Venn diagrams.<br><br>Percentages, growth and decay, compound measures (Distance, density and pressure). |

| **Support at home** | Websites:<br>• Corbettmaths: https://corbettmaths.com/<br>• Maths Genie GCSE Revision: https://www.mathsgenie.co.uk/gcse.html<br>• Dr Frost: https://www.drfrostmaths.com/ | Physical resources:<br>• Mathematics: Purposeful Practice Book – Foundation<br>• GCSE Maths Edexcel Exam Practice Workbook: Foundation - for the Grade 9-1 Course<br>• GCSE (9-1) Maths Foundation Revision Flashcards |
|---|---|---|

| **Assessments:** | **Careers in the Curriculum:** |
|---|---|
| AP1: Numbers; Algebra; Graphs, tables and charts; Fractions and percentages; Equations, inequalities and sequences. | • **Administrative work with figures** - in all organisations, ranging from local authorities to manufacturers - perhaps working in payroll or accounts.<br>• **Financial services** - banking, building society work, insurance and pensions<br>• **Management** - e.g. to work out budgets or analyse performance figures |

| | |
|---|---|
| AP2: Angles; averages and range; Perimeter; area and volume; Graphs.<br><br>AP3: End of the year 10 exam. GCSE paper without the year 11 content. It will condition the new sets in year 11. | • **Market research** - often involves quantitative research to work out customers' wants and needs<br>• **Quantity surveying** - working out costs for major building projects.<br>• **Purchasing** - buying goods or raw materials for an organisation, at the best possible price.<br>• **Logistics** - working out the most efficient way to move goods and people around. |

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

**SUBJECT Mathematics – Key Stage 4**

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| Year 11 Higher | Area of Study: Equations and graphs; Circle Theorems | Area of Study: Advance algebra | Area of Study: Vectors and geometric proofs | Area of Study: Proportion and graphs | Area of Study: Revision for Summer GCSE Exams | Area of Study: |
| | Content:<br><br>Solving simultaneous equations graphically, representing inequalities graphically, quadratic and cubic functions, and iteration.<br><br>Radii, chords and tangents of a circle; and applying the circle theorems. | Content:<br><br>Rearranging complex formulae, working with algebraic fractions, proofs, working with surds, and solving algebraic fraction equations. | Content:<br><br>Vector notation, arithmetic with vectors, parallel vector and collinear points, and solving geometric problems. | Content:<br><br>Direct and inverse proportion, exponential functions and non-linear graphs, transformations of graphs (Translation, Reflection and Stretch) | Content:<br><br>Revision of the key topics and practise past exam papers. | Content: |

| **Support at home** | Websites:<br>• Corbettmaths: https://corbettmaths.com/<br>• Maths Genie GCSE Revision: https://www.mathsgenie.co.uk/gcse.html<br>• Dr Frost: https://www.drfrostmaths.com/ | Physical resources:<br>• Mathematics: Purposeful Practice Book – Higher<br>• GCSE Maths Edexcel Exam Practice Workbook: Higher - for the Grade 9-1 Course<br>• GCSE (9-1) Maths Higher Revision Flashcards |
|---|---|---|

| **Assessments:** | **Careers in the Curriculum:** |
|---|---|
| AP1: Mock 1 in November. All GCSE content up to date. | • **Accountancy -** recording and analysing financial information for individuals, companies, public sector organisations etc<br>• **Architecture** - combines a flair for design with mathematical skills.<br>• **Broking and trading** - buying and selling stocks, shares, bonds and commodities.<br>• **Computing** - e.g. working in software development or systems analysis |

| | |
|---|---|
| AP2: Internal Maths Mock 2 in March. All GCSE content up to date.<br><br>AP3: GCSE Summer exams in May and June | • **Financial advice work** - advising people about their personal finances.<br>• **Medical and healthcare work** - many careers in these areas require an ability with clinical measurements, interpreting figures etc. There are also various jobs in health informatics that are concerned with the collection, management, use and sharing of information, in order to improve healthcare. |

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

**SUBJECT Mathematics – Key Stage 4**

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| Year 11 Foundation | Area of Study: Constructions, loci and bearings | Area of Study: Quadratic equations and graphs<br><br>Perimeter, area and volume | Area of Study: Fractions, indices and standard form | Area of Study: Congruence, similarity and vectors; Advance algebra | Area of Study: Revision for Summer GCSE Exams | Area of Study: |
| | Content:<br><br>Plans and elevations in 3D Solids, accurate drawings and constructions of triangles, scale drawings and maps, bearings, loci and regions. | Content:<br><br>Expanding double brackets, plotting and using quadratic graphs, factorising quadratic expressions and solving quadratic equations.<br><br>Circumference and area of circles, semicircles and sectors, composite 2D shapes, cylinders, pyramids, cones, spheres and composite 3D solids. | Content:<br><br>Working with fractions and mixed numbers, laws of indices and standard form. | Content:<br><br>Similarity and enlargement, congruence and working with vectors.<br><br>Graphs of cubic and reciprocal functions, non-linear graphs, solving simultaneous equations graphically and algebraically, rearranging formulae and algebraic proofs. | Content:<br><br>Revision of the key topics and practise past exam papers. | Content: |

| **Support at home** | Websites:<br>• Corbettmaths: https://corbettmaths.com/<br>• Maths Genie GCSE Revision: https://www.mathsgenie.co.uk/gcse.html<br>• Dr Frost: https://www.drfrostmaths.com/ | Physical resources:<br>• Mathematics: Purposeful Practice Book – Foundation<br>• GCSE Maths Edexcel Exam Practice Workbook: Foundation - for the Grade 9-1 Course<br>• GCSE (9-1) Maths Foundation Revision Flashcards |
|---|---|---|

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

| **Assessments:** | **Careers in the Curriculum:** |
|---|---|
| AP1: Mock 1 in November. All GCSE content up to date.<br><br>AP2: Internal Maths Mock 2 in March. All GCSE content up to date.<br><br>AP3: GCSE Summer exams in May and June | • **Accountancy -** recording and analysing financial information for individuals, companies, public sector organisations etc<br>• **Architecture** - combines a flair for design with mathematical skills.<br>• **Broking and trading** - buying and selling stocks, shares, bonds and commodities.<br>• **Computing** - e.g. working in software development or systems analysis<br>• **Financial advice work** - advising people about their personal finances.<br>• **Medical and healthcare work** - many careers in these areas require an ability with clinical measurements, interpreting figures etc. There are also various jobs in health informatics that are concerned with the collection, management, use and sharing of information, in order to improve healthcare. |

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

**SUBJECT Mathematics – Key Stage 5**

Year 12 A-Level Maths

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| | Area of Study:<br>PURE: Algebra and graphs<br>MECHANICS: Modelling in Mechanics | Area of Study:<br>PURE: Algebra, geometry and Binomial expansion<br>MECHANICS: Constant acceleration SUVAT | Area of Study:<br>PURE: Trigonometry<br>MECHANICS: Forces | Area of Study:<br>PURE: Calculus – Differentiation and Integration;<br>Vectors | Area of Study:<br>PURE: Algebra and exponential/log graphs; Vectors | Area of Study:<br>PURE: Sequences and binomial expansion.<br>MECHANICS: Variable acceleration |
| | Content:<br><br>Working with algebraic expressions, index laws, surds, working with quadratic expressions, the concept of discriminant, modelling with quadratic equations, simultaneous equations, inequalities and regions.<br><br>Cubic, quartic and reciprocal graphs, points of intersection between graphs, transformation of graphs (translation, reflection and stretch).<br><br>Modelling with quadratics, modelling assumptions, units and quantities in Mechanics and working with vectors. | Content:<br><br>Equations of straight-lines, parallel and perpendicular lines, length and area, midpoint and perpendicular bisectors, equation of a circle, intersection of straight-lines and circles, tangent and chord properties, circles and triangles.<br><br>Algebraic fractions, factor theorem, dividing polynomials, mathematical proofs.<br><br>Pascal's triangles, factorial notation, solving binomial problems, and binomial estimation.<br><br>Displacement-time and velocity-time graphs, SUVAT formulae, horizontal motion and vertical motion under the gravity. | Content:<br><br>The sine and cosine rules, areas of triangles, solving triangle problems, trigonometric graphs and its transformations; CAST diagrams, exact trigonometric values, trigonometric identities, solving trigonometric equations.<br><br>Forces diagrams, forces and acceleration, forces and vectors in 2 dimensions, connected particles and pulleys. | Content:<br><br>Gradient of curves, finding the derivative by first principles, differentiating basic polynomials, gradients tangents and normals, studying growth of functions, stationary points, second order derivate and modelling with differentiation.<br><br>Integrating basic polynomials, indefinite and definite integrals, calculating areas under the curves, under the x-axis and between curves and lines.<br><br>Representing vectors, Magnitude and direction. | Content:<br><br>Exponential functions, $y=e^x$ , exponential modelling, logarithms laws, solving equations with logs, working with natural logs, logarithms and non-linear data.<br><br>Algebraic fractions, partial fractions, the modulus function, functions and mapping, composite and inverse functions, combining transformations of functions and solving modulus functions.<br><br>Position vectors, solving geometric problems and modelling with vectors. | Content:<br><br>Arithmetic and geometric sequences and series, sum to infinity, sigma notation, recurrence relations and modelling with series.<br><br>Expanding complex binomial to the power of n and using partial fractions in binomial expansion.<br><br>In function of time, using differentiation to find maxima and minima problems, using integration in mechanics and constant acceleration formulae using calculus. |

| **Support at home** | Websites:<br>• https://www.examsolutions.net/<br>• https://www.physicsandmathstutor.com/ | Physical resources:<br>• Edexcel As/A level Mathematics Pure Year 1 textbook.<br>• Edexcel As/A level Mathematics Statistics and Mechanics Year 1 textbook. |
|---|---|---|

| **Assessments:** | **Careers in the Curriculum:** |
|---|---|

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

| | |
|---|---|
| AP1: BASELINE Assessment in September: GCSE Higher content based. Algebra, graphs, geometry, Binomial expansion and Modelling in Mechanics.<br><br>AP2: Trigonometry, Calculus, Constant acceleration and forces.<br><br>AP3: End of the year 12 exam. All year 12 content for Pure and Mechanics. | • **CHEMICAL ENGINEER** - Much of chemical engineers' mathematical work is planning and the theoretical "modelling" of production processes and analysis that takes place on computer or in preliminary reports.<br>• **CARTOGRAPHER** - Maths helps cartographers with map scale, coordinate systems, and map projection.<br>• **ECONOMIST** - Use mathematical models to better understand such issues as the nature and length of business cycles, the effects of inflation, or the effects of tax legislation on unemployment levels.<br>• **ELECTRICAL ENGINEER** - Great increases in both speed and accuracy can be obtained by using analytical solutions for parts of the problem, or by careful development of appropriate algorithms. |

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

**SUBJECT Mathematics – Key Stage 5**

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| Year 13 A-Level Maths | Area of Study:<br>PURE: Angles and radians; Trigonometry and Parametric equations<br>MECHANICS: Moments, forces and friction | Area of Study:<br>PURE: Differentiation and Numerical methods<br>MECHANICS: Projectiles | Area of Study:<br>PURE: Integration<br>STATS: Data collection<br>MECHANICS: Application of Forces | Area of Study:<br>PURE: Vectors<br>STATS: Measures of location and spread; Correlation; Probability; Statistical distribution; Hypothesis testing and Regression | Area of Study:<br>STATS: Conditional Probability and the Normal Distribution<br>MECHANICS: Further kinematics | Area of Study:<br>Revision for Summer A-Level Exams |
| | Content:<br><br>Radian measure, arc length, area of sectors and segments, solving trigonometric equations using radians and small angle approximations.<br><br>Using and graphing reciprocal functions, more trigonometric identities, inverse trigonometric functions.<br>Using angle addition and double angle formulae, solving complex trigonometric equations, proving trigonometric identities and modelling with trigonometric functions.<br><br>Using trigonometric identities in parametric equations, sketching curves, points of intersection and modelling with parametric.<br><br>Centre of mass, tilting, resolving forces, inclined planes and friction. | Content:<br><br>Differentiating trigonometric and exponential functions, Chain product and quotient rules, parametric and implicit differentiation, using second order derivatives.<br><br>Locating roots, iteration, Newton-Raphson method and application to modelling.<br><br>Horizontal and vertical projection, projection at any angle, projectile motion formulae. | Content:<br><br>Using trigonometric identities in integration, reverse chain rule, integrating by substitution, integrating by parts, using partial fractions in integration, finding areas using parametrics, trapezium rule, solving and modelling with differential equations, proof by contradiction.<br><br>Population and sampling; Types of data and Large data sets.<br><br>Modelling with static particles, static rigid bodies, dynamics and inclined planes, connected particles. | Content:<br><br>3D coordinates, vectors in 3D, solving geometric problems and application of 3D vectors in mechanics.<br><br>Measures of central tendency and other measures of location; Measures of spread; Variance and standard deviation; Coding; Outliers; Box plots; Cumulative frequency; Histograms; Comparing data; Correlation; Linear Regression; Calculating probability; Venn diagrams; Mutually exclusive and independent events; Tree diagrams; Probability distribution; The binomial distribution; Cumulative probabilities; Hypothesis Testing; Finding critical values; One and Two tailed test; Exponential models, measuring correlation and hypothesis testing for zero correlation. | Content:<br><br>Set notation, conditional probability in Venn diagrams, probability formulae and tree diagrams.<br><br>Finding probabilities for normal distribution, Inverse and standard normal distribution, finding mean and standard deviation, Approximating to a binomial distribution and hypothesis testing.<br><br>Vectors in kinematics, vector methods with projectiles, variable acceleration in one dimension and differentiation and integrating vectors. | Content:<br><br>Revision of the key topics and practise past exam papers. |

| **Support at home** | Websites:<br>• https://www.examsolutions.net/<br>• https://www.physicsandmathstutor.com/ | Physical resources:<br>• Edexcel As/A level Mathematics Pure Year 2 textbook.<br>• Edexcel As/A level Mathematics Statistics and Mechanics Year 2 textbook. |
|---|---|---|

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

| **Assessments:** | **Careers in the Curriculum:** |
| --- | --- |
| AP1: Mock exam. All A-Level content taught up to date.<br><br>AP2: Year 13 Trigonometry, Parametric equations, Year 13 Calculus and numerical methods.<br><br>AP3: A-Level Summer exams in May and June. | • **BUDGET ANALYST** - Budget analysts require the mathematical problem-solving skills necessary in order to develop, analyse, and execute budgets for various sizes of companies.<br>• **ARCHITECT** - Mathematics is needed to analyse and calculate structural problems in order to engineer a solution that will assure that a structure will remain standing and stable.<br>• **COMPUTER SCIENTIST** - Computer scientists use mathematics as they span a range of topics from theoretical studies of algorithms, which are a series of steps understood in order to complete a task in a given number of steps.<br>• **CHEMIST** - balance the equation of a chemical reaction, use mathematical calculations that are absolutely necessary to explore important concepts in chemistry. |

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

**SUBJECT Mathematics – Key Stage 5**

Year 12 Maths in Context

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| | Area of Study:<br><br>Social Networking | Area of Study:<br><br>Society | Area of Study:<br><br>Sport | Area of Study:<br><br>The Clothing industry and Finance | Area of Study:<br><br>Creative arts | Area of Study:<br><br>Health |
| | Content:<br><br>Social network usage, social networking in different countries, six degrees of separation.<br><br>Maths skills: Mean Median LQ UQ, Cumulative frequency, Variance, Standard deviation. | Content:<br><br>Life expectancy and wealth, coping with risk, marriages in England and Wales, social housing, population growth.<br><br>Maths skills: Straight-line graph, Real-life Graphs, Simultaneous equations, PMCC, Probability, Moving Averages, Linear Inequalities, Sequences, Iteration. | Content:<br><br>Golf, athletics, football, tennis.<br><br>Maths skills: Scatter graph, Percentages, LQ UQ, Box-plots, Spearman's rank, Linear Regression, Venn diagrams. | Content:<br><br>Manufacturing baby clothes, dyeing fabrics.<br><br>Maths skills: Inequalities, Simultaneous equations, Probability, Iterations.<br><br>Income tax, life insurance, car loans, mortgages.<br><br>Maths skills: Formula, Percentages, Compound Interest, Iteration, Tax, Cumulative frequency. | Content:<br><br>Ratios and art, making music, music software.<br><br>Maths skills: Plot graphs, Ratios, Geometric sequences, Fibonacci Sequence, Golden ratio, Iteration, Linear Sequences, Spearman's rank, Log function, Fibonacci sequence, Sum of convergent series, Linear graph, Sum of Nth-terms. | Content:<br><br>Measles and vaccination, paracetamol.<br><br>Skills: Percentages, Venn diagrams, Probability tree diagram, Standard deviation, Log functions. |

| **Support at home** | Websites:<br>• Corbettmaths: https://corbettmaths.com/<br>• Maths Genie GCSE Revision: https://www.mathsgenie.co.uk/gcse.html<br>• Dr Frost: https://www.drfrostmaths.com/ | Physical resources:<br>• Edexcel Level 3 Maths in context Project Book.<br>• Edexcel As/A level Mathematics Statistics Year 1 textbook. |
|---|---|---|

| **Assessments:** | **Careers in the Curriculum:** |
|---|---|
| AP1: BASELINE Assessment in September: GCSE Statistics content based. Mean Median LQ UQ, Cumulative frequency, Variance, Standard deviation. | • **BIOLOGIST** - Biologists use math as they plot graphs to help them understand equations, run small "trial and error" tests with some sample numbers when developing algorithms. |

| | |
|---|---|
| AP2: Straight-line graph, Real-life Graphs, Simultaneous equations, PMCC, Probability, Moving Averages, Linear Inequalities, Sequences, Iteration.<br><br>AP3: End of the year 12 exam. All year 12 content for Maths in context. | • **FOREIGN EXCHANGE TRADER** - Some of the most important characteristics learned from studying math as a foreign exchange trader are quick decision-making skills, problem-solving skills, and a sharp analytic mind.<br>• **POLITICAL SCIENTIST** - Political scientists use maths and statistics to predict the behaviour of a group of people. They must keep track of the social, political, and monetary implications of a community's opinions and actions.<br>• **PURCHASING AGENT** - Purchasing managers find that they are called on to solve problems, handle details, and coordinate many activities during intense work periods. They must also be comfortable handling complex data and have the ability to see the data from numerous perspectives. |

Holmer Green Senior School

Work Hard, Be Kind, Have Passion

**SUBJECT Mathematics – Key Stage 5**

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| Year 13 Maths in Context | Area of Study:<br><br>Economy | Area of Study:<br><br>Travel | Area of Study:<br><br>Environment and disasters | Area of Study:<br><br>Engineering | Area of Study:<br><br>Revision for Summer Maths in context Exams | Area of Study: |
| | Content:<br><br>Payday loans, imports and exports, vinyl record sales.<br><br>Maths skills: Probability, Formula, Averages, Interest, Quadratic graph, Venn diagrams, Histogram, Sequences, Sum of series. | Content:<br><br>Stopping distances, international travel, tourism.<br><br>Maths skills: Formula, Scatter graph, calculate averages, Speed Velocity, Moving averages, PMCC | Content:<br><br>Deforestation, the cost of going green, climate and weather.<br><br>Maths skills: Interest, Percentage, Quadratic sequences, Differentiation, Quadratic graph, Quadratic sequences, Moving Averages, Regression line.<br><br>Earthquakes, hurricanes, fires.<br><br>Maths skills: Substitute into formulae, Scatter diagram, Log function, Regression line, PMCC | Content:<br><br>Manufacturing paper, the electromagnetic spectrum, project management.<br><br>Maths skills: Probabilities, Inequalities, Cumulative, Frequency, Wave length, Reciprocal graphs. | Content:<br><br>Revision of the key topics and practise past exam papers. | Content: |

| **Support at home** | Websites:<br>• Corbettmaths: https://corbettmaths.com/<br>• Maths Genie GCSE Revision: https://www.mathsgenie.co.uk/gcse.html<br>• Dr Frost: https://www.drfrostmaths.com/ | Physical resources:<br>• Edexcel Level 3 Maths in context Project Book.<br>• Edexcel As/A level Mathematics Statistics Year 1 textbook. |
|---|---|---|

| **Assessments:** | **Careers in the Curriculum:** |
|---|---|
| AP1: Mock exam. All Maths in context content taught up to date. | • **CLIMATOLOGIST** - A climatologist uses mathematical skills in collecting climate data, investigating climate indicators, and making predictions regarding climate patterns. |

| | |
|---|---|
| AP2: Probability, Formula, Averages, Interest, Quadratic graph, Venn diagrams, Histogram, Sequences, Sum of series, Formula, Scatter graph, calculate averages, Speed Velocity, Moving averages, PMCC.<br><br>AP3: Maths in context Summer exams in May and June. | • **GEOGRAPHER**- Geographers use mathematical calculations in order to identify population centres in different countries. Geographers also work extensively with maps and tables.<br>• **GEOLOGIST** - Mathematical geology can be an essential aid in formulating models and scientific theories to bring together different geological phenomena.<br>• **EPIDEMIOLOGIST** - Epidemiologists use mathematical models in order to track the progress of most infectious diseases. They may also discover the likely outcome of an epidemic or to help manage them by vaccination. |