Holmer Green Senior School

Mathematics

2025-26

Curriculum Intent

Work Hard, Be Kind, Have Passion

The aims of our Maths curriculum is to ensure that our students:

- Are confident, analytical and problem-solving thinkers, developing ability to apply mathematics to everyday situations;
- Have the appreciation of mathematics through questioning and curiosity;
- Question the world around them and unravel assumptions to arrive at their own logical conclusions.

Outstanding lessons

We aim to cover all the mathematical knowledge required to succeed in the Maths GCSE, to be able to access the Sixth form Maths courses and having the best of opportunities in further education or employment.

From year 7 up to 11, students will have the opportunity to study the 5 fundamental strands of secondary mathematics: Numeracy, Algebra, Geometry, Data and Probability. Each year, students will revisit each part, increasing the depth by adding new topics to their schema, sustained by prior knowledge.

The schemes of work are flexible and adapted to each set, so students have the time the need to process the new content. In key stage 3 there is a common curriculum, with support and extension, and an hour per week of numeracy. In key stage 4, students are separated in two tiers, Higher and Foundation, depending on their tier of entry for GCSE.

HGSS Curriculum Map

Year 7 Maths

Exam Board: Edexcel Pearson			Careers: finance, engineering, teacher, analyst.		Co-Curricular: Junior UKMT Challenge		Sequencing: topics from Primary level are developed	
	Autumn 1	**Autumn 2**	**Spring 1**	**AP1**	**Spring 2**	**Summer 1**	**Summer 2**	**AP2**
Content	Analysing and displaying data Number skills	Introduction to Algebra Decimals and measures	Perimeter and area Fractions and percentages	Topics covered in Y7 to date	Probability Ratio and proportion	Lines and angles	Sequences and graphs Transformations	Topics covered since AP1
Skills:	Calculating averages Comparing data Drawing and interpreting Bar charts and line graphs Arithmetic Working with factors, multiples and Primes	Using function machines Simplifying expressions Substituting into formulae Writing formulae Working with: decimals and rounding Length, mass and capacity	Calculating area and perimeter of simple and compound Shapes Comparing and simplifying fractio ns Converting fractions and deci mals Calculating Percentages of amounts		Using the language of Probability Calculating Probability Working with experimental probability Expected outcomes Writing ratios Converting ratio to fractions	Measuring and drawing angles Drawing triangles accurately Calculating Angles Quadrilaterals	Finding the next term Plotting coordinates Straight line Graphs Position to Term rules Understanding Congruency and symmetry Reflections and rotations	

HGSS Curriculum Map

Year 8 Maths

Exam Board: Edexcel Pearson			Careers: finance, engineering, teacher, analyst.		Co-Curricular: Junior UKMT Challenge		Sequencing: spiral curriculum further developing Y7 topics	
	Autumn 1	**Autumn 2**	**Spring 1**	**AP1**	**Spring 2**	**Summer 1**	**Summer 2**	**AP2**
Content	Number Area	Volume Statistics, graphs and charts	Expressions and equations Real life graphs	Topics covered in Y8 to date	More real-life Graphs Decimals and ratio	Geometry Fractions	Straight line graphs Percentages, decimals and fractions	Topics covered in Y8 since AP1
Skills:	Calculations Using divisibility rules Calculating with: negative integers, powers and roots, brackets, multiples and factors	Working with volume of cubes and cuboids, 2D representation of 3D solids, surface area of cubes and cuboids. Drawing and Interpreting: pie charts, tables, stem and leaf, scatter graphs. Comparing data Investigating misleading graphs	Working with: algebraic powers, expressions and brackets, Factorising expressions Solving one-step and two-step equations Drawing and interpreting: conversion graphs, distance-time graphs line graphs		Drawing and interpreting real-life graphs Ordering and rounding decimals Place-value calculations Calculations and ratio and proportion with decimals Working with quadrilaterals, alternate angles and proof	Working with angles in parallel lines Calculations wit h exterior and interior angles Ordering fractions Adding and subtracting fractions Multiplying and dividing fractions Calculating with mixed numbers	Understanding graphs of direct proportion Drawing and interpreting graphs of equations of straight lines Conversions between fractions and decimals Writing equivalent proportions and percentages Percentages of amounts	

HGSS Curriculum Map
Year 9 Maths

Exam Board: Edexcel Pearson			Careers: finance, engineering, teacher, analyst.		Co-Curricular: Intemediate UKMT Challenge		Sequencing: spiral curriculum further developing Y8 topics	
	Autumn 1	**Autumn 2**	**Spring 1**	**AP1**	**Spring 2**	**Summer 1**	**Summer 2**	**AP2**
Content	Indices Expressions and formulae	More indices Dealing with data Enlargement	Multiplicative reasoning Constructions nth term rules	Topics covered in Y9 to date	Non-linear sequences Inequalities Equations Proportion Circles Pythagoras And Prisms	Graphs Probability	Probability Comparing shapes and trigonometry	Topics covered in Y9 since AP1
Skills:	Calculation and estimates with indices including standard form Solving equations, Substitution Writing and using formulae	Index laws and brackets Planning a survey Collecting data Calculating averages displaying, analysing, presenting and comparing data Enlargement with negative and fractional scale factors	Percentage change Working with compound measures Working with direct and inverse proportion nth term of arithmetic sequences		Working with non-linear sequences Solving inequalities and equations Working with proportion Calculating area circumference, Measures in triangles, prisms and cylinders Accuracy	Using y=mx+c Forming and solving simultaneous equations Drawing and interpreting quadratic and other non-linear graphs Defining mutually exclusive events Working with experimental and theoretical probability	Drawing and interpreting: sample space diagrams 2-way tables Venn diagrams Defining congruence and similarity Using trigonometry to find lines and angles	

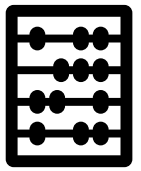
HGSS Curriculum Map

Year 10 Maths (Higher)

Exam Board: Edexcel Pearson			Careers: finance, engineering, teacher, analyst.		Co-Curricular: Intemediate UKMT Challenge		Sequencing: spiral curriculum further developing Y9 topics	
	Autumn 1	**Autumn 2**	**Spring 1**	**AP1**	**Spring 2**	**Summer 1**	**Summer 2**	**AP2**
Content	Numbers and Algebra	Interpreting and representing data; Fractions, ratio and percentages; Angles and trigonometry	Graphs; Area and volume	Topics covered in Y10 to date	Transformations and constructions; Equations and inequalities	Probability; Multiplicative reasoning; Similarity and Congruence	Advance Trigonometry and Advance Statistics	End of year 10 exam in the Sports hall
Skills:	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. Algebraic indices; Expanding and factorising; Equations; Formulae; Linear and Non-linear sequences.	Statistical diagrams; Scatter graphs; Line of best fit; Averages and range. Fractions; Ratios and proportion; Fractions, decimals and percentages. Angles properties of triangles and quadrilaterals; Interior and exterior angles of a polygon; Pythagoras Theorem; Trigonometry.	Linear graphs; Graphing rates of change; Real-life graphs; Line segments; Quadratic graphs; Cubic and reciprocal graphs Perimeter and area; Units and accuracy; Prisms; Circles; Sectors of circles; Cylinders and spheres; Pyramids and cones.		Plans and elevations of 3D solids, Transformations of 2D Shapes, Scale drawings, calculation of bearings, Constructions of 2D shapes, and Loci. Solving linear inequalities, solving quadratic equations, completing the square and simultaneous equations.	Calculation of probability with combined events and mutually exclusive events; independent events, conditional probability and probability in tree and Venn diagrams. Growth and decay, compound measures (Speed, density and pressure. Geometric proof with congruence and similarity, similarity problems with length, area and volume.	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. Sampling, capture/re-capture method, cumulative frequency diagrams, box plots, drawing and interpreting histograms, comparing and describing distributions.	

HGSS Curriculum Map

Year 10 Maths (Foundation)



Exam Board: Edexcel Pearson			**Careers: finance, engineering, teacher, analyst.**		**Co-Curricular: Intemediate UKMT Challenge**		**Sequencing: spiral curriculum further developing Y9 topics**	
	Autumn 1	**Autumn 2**	**Spring 1**	**AP1**	**Spring 2**	**Summer 1**	**Summer 2**	**AP2**
Content	Numbers and Algebra	Graphs, tables and charts; Fractions and percentages; Equations, inequalities and sequences	Angles; averages and range	Topics covered in Y10 to date	Perimeter; area and volume; Graphs	Transformations; Ratio and proportion; Right-angle triangles	Probability and Multiplicative reasoning	End of year 10 exam in the Sports hall
Skills:	Calculations; Decimal numbers; Place value; Factors and multiples; Squares, cubes and roots; Index notation and Prime factors. Algebraic expressions; Simplifying expressions; Substitution; Formulae; Expanding brackets and Factorising.	Frequency tables; Two-way tables; Representing data; Time series; Stem and leaf diagrams; Pie Charts; Scatter graphs and Line of best fit. Operations with fractions (add, subtract, multiply and divide); Fractions and decimals; Fractions and percentages; Calculating percentages; Simple interest and Multiplier Solving equations; Inequalities; Using formulae; Generating sequences and Using the nth term of a sequence.	Properties of shapes; Angles in parallel lines; Angles in triangles; Exterior and interior angles of polygons and Geometrical problems. Mode, median, Mean and range; Types of average; Estimating the mean from a frequency table and Sampling.		Properties and area of basic 2D shapes, area of compound shapes, surface area of 3D solids and volume of prisms. Coordinates, gradient, equation of the straight-line y=mx+c, distance-time graphs and real-life graphs.	Transformations (Translation, rotation, reflection and enlargement) and describing transformations. Writing and using ratios, ratios and measures, comparing using ratios, using proportion and graphs. Pythagoras theorem, trigonometry ratios (Sine, Cosine and Tangent), Finding lengths and angles in triangles using trigonometry.	Calculating probability, experimental probability, calculating probability through tree and Venn diagrams. Percentages, growth and decay, compound measures (Distance, density and pressure).	

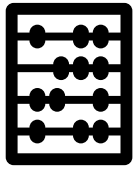
HGSS Curriculum Map

Year 11 Maths (Higher)

Exam Board: Edexcel Pearson			Careers: finance, engineering, teacher, analyst.		Co-Curricular: Intemediate UKMT Challenge		Sequencing: spiral curriculum further developing Y10 topics	
	Autumn 1	**Autumn 2**	**Spring 1**	**AP1**	**Spring 2**	**Summer 1**	**Summer 2**	**AP2**
Content	Equations and graphs	Circle Theorems and Advance algebra	Vectors and geometric proofs	GCSE Mock (Paper 1 and 2) (November)	Proportion and graphs	Revision for Summer GCSE Exams	GCSE Exams	GCSE Mock (Paper 3) (March)
Skills:	Solving simultaneous equations graphically, representing inequalities graphically, quadratic and cubic functions, and iteration.	Radii, chords and tangents of a circle; and applying the circle theorems. Rearranging complex formulae, working with algebraic fractions, proofs, working with surds, and solving algebraic fraction equations.	Vector notation, arithmetic with vectors, parallel vector and collinear points, and solving geometric problems.		Direct and inverse proportion, exponential functions and non-linear graphs, transformations of graphs (Translation, Reflection and Stretch)	Revision of the key topics and practise past exam papers.	GCSE Exams	

HGSS Curriculum Map

Year 11 Maths (Foundation)



Exam Board: Edexcel Pearson			Careers: finance, engineering, teacher, analyst.		Co-Curricular: Intemediate UKMT Challenge		Sequencing: spiral curriculum further developing Y10 topics	
	Autumn 1	**Autumn 2**	**Spring 1**	**AP1**	**Spring 2**	**Summer 1**	**Summer 2**	**AP2**
Content	Constructions, loci and bearings	Quadratic equations and graphs; Perimeter, area and volume	Fractions, indices and standard form; Congruence , similarity and vectors	GCSE Mock (Paper 1 and 2) (November)	Advance algebra	Revision for Summer GCSE Exams	GCSE Exams	GCSE Mock (Paper 3) (March)
Skills:	Plans and elevations in 3D Solids, accurate drawings and constructions of triangles, scale drawings and maps, bearings, loci and regions.	Expanding double brackets, plotting and using quadratic graphs, factorising quadratic expressions and solving quadratic equations. Circumference and area of circles, semicircles and sectors, composite 2D shapes, cylinders, pyramids, cones, spheres and composite 3D solids.	Working with fractions and mixed numbers, laws of indices and standard form. Similarity and enlargement, congruence and working with vectors.		Graphs of cubic and reciprocal functions, non-linear graphs, solving simultaneous equations graphically and algebraically, rearranging formulae and algebraic proofs.	Revision of the key topics and practise past exam papers.	GCSE Exams	

HGSS Curriculum Map

Year 12 A-Level Maths

Exam Board: Edexcel Pearson		Careers: finance, engineering, teacher, analyst.		Co-Curricular: Senior UKMT Challenge		Sequencing: spiral curriculum further developing Y11 topics	
Autumn 1	**Autumn 2**	**Spring 1**	**AP1**	**Spring 2**	**Summer 1**	**Summer 2**	**AP2**
PURE: Algebra and graphs MECHANICS: Modelling in Mechanics	PURE: Algebra, geometry and Binomial expansion MECHANICS: Constant acceleration SUVAT	PURE: Trigonometry MECHANICS: Forces	Topics covered in Y12 to date	PURE: Calculus – Differentiation and Integration; Vectors	PURE: Algebra and exponential/log graphs; Vectors	PURE: Sequences and binomial expansion. MECHANICS: Variable acceleration	End of year 12 exam in the Sports hall
Working with algebraic expressions, index laws, surds, working with quadratic expressions, the concept of discriminant, modelling with quadratic equations, simultaneous equations, inequalities and regions. Cubic, quartic and reciprocal graphs, points of intersection between graphs, transformation of graphs (translation, reflection and stretch). Modelling with quadratics, modelling assumptions, units and quantities in Mechanics and working with vectors.	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. Algebraic fractions, factor theorem, dividing polynomials, mathematical proofs. Pascal's triangles, factorial notation, solving binomial problems, and binomial estimation. Displacement-time and velocity-time graphs, SUVAT formulae, horizontal motion and vertical motion under the gravity.	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. Forces diagrams, forces and acceleration, forces and vectors in 2 dimensions, connected particles and pulleys.		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. Integrating basic polynomials, indefinite and definite integrals, calculating areas under the curves, under the x-axis and between curves and lines. Representing vectors, Magnitude and direction.	Exponential functions, $y=e^x$, exponential modelling, logarithms laws, solving equations with logs, working with natural logs, logarithms and non-linear data. Algebraic fractions, partial fractions, the modulus function, functions and mapping, composite and inverse functions, combining transformations of functions and solving modulus functions. Position vectors, solving geometric problems and modelling with vectors.	Arithmetic and geometric sequences and series, sum to infinity, sigma notation, recurrence relations and modelling with series. Expanding complex binomial to the power of n and using partial fractions in binomial expansion. In function of time, using differentiation to find maxima and minima problems, using integration in mechanics and constant acceleration formulae using calculus.	

HGSS Curriculum Map

Year 13 A-Level Maths

Exam Board: Edexcel Pearson		Careers: finance, engineering, teacher, analyst.		Co-Curricular: Senior UKMT Challenge		Sequencing: spiral curriculum further developing Y12 topics	
Autumn 1	**Autumn 2**	**Spring 1**	**AP1**	**Spring 2**	**Summer 1**	**Summer 2**	**AP2**
PURE: Angles and radians; Trigonometry and Parametric equations MECHANICS: Moments, forces and friction	PURE: Differentiation and Numerical methods MECHANICS: Projectiles	PURE: Integration STATS: Data collection MECHANICS: Application of Forces	A Level Maths mock Pure and Mechanics	PURE: Vectors STATS: Measures of location and spread; Correlation; Probability; Statistical distribution; Hypothesis testing and Regression	STATS: Conditional Probability and the Normal Distribution MECHANICS: Further kinematics	Revision for Summer A-Level Exams	A Level Maths mock Stats
Radian measure, arc length, area of sectors and segments, solving trigonometric equations using radians and small angle approximations. Using and graphing reciprocal functions, more trigonometric identities, inverse trigonometric functions. Using angle addition and double angle formulae, solving complex trigonometric equations, proving trigonometric identities and modelling with trigonometric functions. Using trigonometric identities in parametric equations, sketching curves, points of intersection and modelling with parametric. Centre of mass, tilting, resolving forces, inclined planes and friction.	Differentiating trigonometric and exponential functions, Chain product and quotient rules, parametric and implicit differentiation, using second order derivatives. Locating roots, iteration, Newton-Raphson method and application to modelling. Horizontal and vertical projection, projection at any angle, projectile motion formulae.	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. Population and sampling; Types of data and Large data sets. Modelling with static particles, static rigid bodies, dynamics and inclined planes, connected particles.		3D coordinates, vectors in 3D, solving geometric problems and application of 3D vectors in mechanics. 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.	Set notation, conditional probability in Venn diagrams, probability formulae and tree diagrams. Finding probabilities for normal distribution, Inverse and standard normal distribution, finding mean and standard deviation, Approximating to a binomial distribution and hypothesis testing. Vectors in kinematics, vector methods with projectiles, variable acceleration in one dimension and differentiation and integrating vectors.modelling with vectors.	Revision of the key topics and practise past exam papers.	

HGSS Curriculum Map

Year 12 Maths in Context

Exam Board: Edexcel Pearson		Careers: finance, engineering, teacher, analyst.		Co-Curricular: Senior UKMT Challenge		Sequencing: spiral curriculum further developing Y11 topics	
Autumn 1	**Autumn 2**	**Spring 1**	**AP1**	**Spring 2**	**Summer 1**	**Summer 2**	**AP2**
Social Networking Social network usage, social networking in different countries, six degrees of separation.	Society Life expectancy and wealth, coping with risk, marriages in England and Wales, social housing, population growth.	Sport Golf, athletics, football, tennis.	Topics covered in Y12 to date	The Clothing industry and Finance Manufacturing baby clothes, dyeing fabrics. Income tax, life insurance, car loans, mortgages.	Creative arts Ratios and art, making music, music software.	Health Measles and vaccination, paracetamol.	End of year 12 exam in the Sport s hall
Mean Median LQ UQ, Cumulative frequency, Variance, Standard deviation.	Straight-line graph, Real-life Graphs, Simultaneous equations, PMCC, Probability, Moving Averages, Linear Inequalities, Sequences, Iteration.	Scatter graph, Percentages, LQ UQ, Box-plots, Spearman's rank, Linear Regression, Venn diagrams.		Inequalities, Simultaneous equations, Probability, Iterations, Formula, Percentages, Compound Interest, Tax, Cumulative frequency.	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.	Percentages, Venn diagrams, Probability tree diagram, Standard deviation, Log functions.	

HGSS Curriculum Map

Year 13 Maths in Context

Exam Board: Edexcel Pearson		Careers: finance, engineering, teacher, analyst.		Co-Curricular: Senior UKMT Challenge		Sequencing: spiral curriculum further developing Y12 topics	
Autumn 1	**Autumn 2**	**Spring 1**	**AP1**	**Spring 2**	**Summer 1**	**Summer 2**	**AP2**
Economy Payday loans, imports and exports, vinyl record sales.	Travel and enviroment Stopping distances, international travel, tourism. Deforestation, the cost of going green, climate and weather.	Disasters Earthquakes, hurricanes, fires.	Maths in Context mock 1 (Novembe r)	Engineering Manufacturing paper, the electromagnetic spectrum, project management.	Revision for Summer Maths in context Exams	Revision for Summer Maths in context Exams	Maths in Context mock 2 (March)
Probability, Formula, Averages, Interest, Quadratic graph, Venn diagrams, Histogram, Sequences, Sum of series.	Formula, Scatter graph, calculate averages, Speed Velocity, Moving averages, PMCC	Interest, Percentage, Quadratic sequences, Differentiation, Quadratic graph, Quadratic sequences, Moving Averages, Regression line. Substitute into formulae, Scatter diagram, Log function, and PMCC		Probabilities, Inequalities, Cumulative, Frequency, Wave length, Reciprocal graphs.	Revision of the key topics and practise past exam papers.	Revision of the key topics and practise past exam papers.	