



Year 11 Higher Scheme of Work

Parent Overview 2026-2027

This parent-friendly Scheme of Work provides an overview of the mathematics taught across Year 11 Higher. For each unit, it shows the building blocks students draw upon, the key learning objectives and the mathematical vocabulary they will meet.

Half term	Curriculum overview
Autumn 1	Unit 1: Probability Unit 2: Further Trigonometry Unit 3: Ratio Unit 4: Histograms Assessment (Maths Genie mini test) Unit 5: Cumulative Frequency And Box Plots
Autumn 2	Mock Exams Unit 6: Circle Theorems 2 Unit 7: Exploring Graphs Unit 8: Circle Geometry
Spring 1	Unit 9: Vectors And Geometric Proof Unit 10: Iteration Mock Exams Unit 11: Real Life Graphs
Spring 2	Unit 12: Quadratic Inequalities Unit 13: Algebraic Fractions Unit 14: Algebraic Proof Unit 15: Congruence Unit 16: Constructions And Loci
Summer 1	Exam Revision and Topic Consolidation GCSE Maths Paper 1 GCSE Maths Paper 2

What the sections mean

Building blocks: knowledge and skills used as a starting point for the unit. | Key objectives: the main mathematics students will learn. | Key words: important mathematical vocabulary used during the unit.

Unit 1: Probability

Building blocks

- Add and multiply fractions and decimals
- Express one number as a fraction of another
- Write probabilities using fractions, percentages or decimals
- List all outcomes for single events, and combined events, systematically
- Draw sample space diagrams and use them for adding simple probabilities
- Know that the sum of the probabilities of all outcomes is 1
- Use $1 - p$ as the probability of an event not occurring where p is the probability of the event occurring
- Understand and use experimental and theoretical measures of probability, including relative frequency to include outcomes using dice, spinners, coins, etc
- Use union, intersection and complement notation
- Find a missing probability from a list or two-way table, including algebraic terms
- Work out probabilities from Venn diagrams to represent real-life situations and also 'abstract' sets of numbers/values

Key objectives

- Use the product rule for counting
- Estimate the number of times an event will occur, given the probability and the number of trials
- Compare experimental data and theoretical probabilities
- Compare relative frequencies from samples of different sizes.
- Find the probability of successive events, such as several throws of a single dice
- Draw a probability tree diagram based on given information, and use this to find probability and expected number of outcome
- Understand selection with or without replacement
- Calculate the probability of independent and dependent combined events; Understand conditional probabilities and decide if two events are independent
- Use a two-way table to calculate conditional probability; Use a tree diagram to calculate conditional probability; Use a Venn diagram to calculate conditional probability

Key words

Probability, Dependent, Independent, Conditional, Tree diagrams, Sample space, Outcomes, Theoretical, Relative frequency, Fairness, Bias, Experimental, Given

Unit 2: Further Trigonometry

Building blocks

- Use right-angled trigonometry to find missing lengths and angles
- Measure, draw and calculate bearings
- Round to a given degree of accuracy
- Area and circumference of a circle

Key objectives

- Know and apply $\text{Area} = \frac{1}{2} ab \sin C$ to calculate the area, sides or angles of any triangle
- Find the arc length and area of a sector
- Find the area of a segment
- Know the sine and cosine rules, and use to solve 2D problems, including involving bearings
- Use the sine and cosine rules to solve 3D problems

Key words

Sine, Cosine, Triangle, Area, Sector, Segment, Bearing of...from..., Tangent

Unit 3: Ratio

Building blocks

- Understand and express the division of a quantity into a of number parts as a ratio
- Write ratios in their simplest form
- Write ratios in form $1 : m$ or $m : 1$
- Write/interpret a ratio to describe a situation
- Share a quantity in a given ratio including three-part ratios
- Write a ratio as a fraction
- Use a ratio to find one quantity when the other or the difference is known; Express a multiplicative relationship between two quantities as a ratio or a fraction.

Key objectives

- Combine ratios
- Write ratio as a linear function
- Express a multiplicative relationship between two quantities as a ratio or a fraction, e.g. when $A:B$ are in the ratio $3:5$, A is B . When $4a = 7b$,
- $7b$
- then $a =$ or $a:b$ is $7:4$
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- Solve ratio problems when ratios are changed by adding or removing items
- Solve two stage ratio problems (e.g. parts of parts)

Key words

Ratio, Part, Combine, Compare, Fraction, Equation, Change

Unit 4: Histograms

Building blocks

- Know the meaning of continuous data
- Understand and use grouped frequency tables
- Interpret histograms for grouped data with equal class intervals

Key objectives

- Know the appropriate uses of histograms
- Construct and interpret histograms from class intervals with unequal width
- Use and understand frequency density; From histograms: complete a grouped frequency table; understand and define frequency density
- Estimate the mean from a histogram
- Estimate the median from a histogram with unequal class widths or any other information from a histogram, such as the number of people in a given interval.

Key words

Continuous data, Grouped data, Table, Frequency table, Frequency, Frequency density, Histogram, Scale, Graph, Axis, axes

Unit 5: Cumulative Frequency And Box Plots

Building blocks

- Plotting coordinates and graphs
- Understand the use of inequality symbols
- Complete a frequency table
- Calculate averages and range
- Use a graph to find a value of x given y and vice versa

Key objectives

- Know the appropriate uses of cumulative frequency diagrams
- Construct and interpret cumulative frequency tables
- Construct and interpret cumulative frequency graphs/diagrams and from the graph: estimate frequency greater/less than a given value
- find the median and quartile values and interquartile range; Compare the mean and range of two distributions, or median and interquartile range, as appropriate
- Interpret box plots to find median, quartiles, range and interquartile range and draw conclusions
- Produce box plots from raw data and when given quartiles, median and identify any outliers

Key words

Box plot, box-and-whisker diagram, Central tendency, Mean, median, mode, Spread, dispersion, consistency, Range, Interquartile range, Skewness, Discrete, Continuous, Grouped data, Axis, axes, Population, Sample, Cumulative frequency

Unit 6: Circle Theorems 2

Building blocks

- Recall the definition of a circle and identify (name) and draw parts of a circle, including sector, tangent, chord, segment; Prove and use the facts that: the angle subtended by an arc at the centre of a circle is twice the angle subtended at any point on the circumference; the angle in a semicircle is a right angle; angles in the same segment are equal
- opposite angles of a cyclic quadrilateral sum to 180°

Key objectives

- Use the facts that:
- the fact that the angle between a tangent and radius is 90°
- the tangent at any point on a circle is perpendicular to the radius at that point
- alternate segment theorem
- the perpendicular from the centre of a circle to a chord bisects the chord
- Prove the circle theorems (not the tangent properties)

Key words

Radius, Centre, Tangent, Circumference, Diameter, Perpendicular, Chord, Triangle, Isosceles, Angles, Degrees, Cyclic quadrilateral, Alternate, Segment, Semicircle, Arc, Theorem, Subtend

Unit 7: Exploring Graphs

Building blocks

- Plotting coordinates
- Complete a table of values
- Sketch or plot a linear graph
- Sketch or plot a quadratic
- Sketch or plot other non linear graphs
- Exact trig values
- Describing transformations
- Know the exact values of $\sin \theta$ and $\cos \theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and 90° and exact value of $\tan \theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ$ and 60°

Key objectives

- Recognise a linear, quadratic, cubic, reciprocal and exponential graphs
- Draw graphs of simple cubic functions using tables of values
- Interpret graphs of simple cubic functions, including finding solutions to cubic equations
- Draw graphs of the reciprocal function with $x \neq 0$ using tables of values
- State the value of x for which the equation is not defined
- Recognise, sketch and interpret graphs of exponential functions $y = kx$ for positive values of k and integer values of x
- Recognise, sketch and interpret graphs of the trigonometric functions (in degrees) $y = \sin x$, $y = \cos x$ and $y = \tan x$ for angles of any size
- Relate knowledge of exact values to the graphs
- Use trigonometric graphs to find solutions to simple equations
- Transformations of Graphs
- Interpret and analyse transformations of graphs of functions and write the functions algebraically, e.g. write the equation of $f(x) + a$, or $f(x - a)$: apply to the graph of $y = f(x)$ the transformations $y = -f(x)$, $y = f(-x)$ for linear, quadratic, cubic and trigonometric functions
- apply to the graph of $y = f(x)$ the transformations $y = f(x) + a$, $y = f(x + a)$ for linear, quadratic, cubic and trigonometric functions

Key words

Cubic, Quadratic, Reciprocal, Exponential, Trigonometric, Turning Point, Asymptote, Root, Translation, Reflection, Function, Axes, Undefined, Plot, Sketch

Unit 8: Circle Geometry

Building blocks

- Find the gradient of a line
- Know that perpendicular gradients have a product of -1
- Find the equation of a line through one point with a given gradient
- Find the equation of a line through two given points
- Know and apply Pythagoras' Theorem
- Rearrange an equation into the form $y = mx + c$

Key objectives

- Recognise and construct the graph of a circle using $x^2 + y^2 = r^2$ for radius r centred at the origin of coordinates
- Draw circles, centre the origin, equation $x^2 + y^2 = r^2$
- Find the equation of a tangent to a circle at a given point, by: finding the gradient of the radius that meets the circle at that point (circles all centre the origin)
- finding the gradient of the tangent perpendicular to it; using the given point
- Find the point of intersection of a line and a circle
- Select and apply construction techniques and understanding of loci to draw graphs based on circles and perpendiculars of lines

Key words

Circle, Equation, Centre, Origin, Tangent, Intersection, Gradient, Radius, Perpendicular, Sketch, Plot

Unit 9: Vectors And Geometric Proof

Building blocks

- Understand and use vector notation, including column notation, and understand and interpret vectors as displacement in the plane with an associated direction
- Calculate the sum of two vectors, the difference of two vectors and a scalar multiple of a vector using column vectors (including algebraic terms)
- Use Pythagoras' Theorem
- Properties of triangles and quadrilaterals; Translation

Key objectives

- Understand that $2a$ is parallel to a and twice its length, and that a is parallel to $-a$ in the opposite direction.
- Represent vectors, combinations of vectors and scalar multiples in the plane pictorially
- Find the length of a vector using Pythagoras' Theorem
- Calculate the resultant of two vectors
- Solve geometric problems in 2D where vectors are divided in a given ratio; Produce geometrical proofs to prove points are collinear and vectors/lines are parallel

Key words

Vector, Direction, Magnitude, Scalar, Multiple, Parallel, Collinear, Proof, Ratio, Column vector

Unit 10: Iteration

Building blocks

- Solving polynomials
- Rearranging formulae
- Using a calculator effectively

Key objectives

- Use iteration to find approximate solutions to equations, for simple equations in the first instance, then quadratic and cubic equations
- Know and use the fact that a sign change shows a solution
- Use an iterative process to solve problem in context
- Use iteration with simple converging sequences

Key words

Iteration, Iterative, Approximate, Solution, Solve, Converge, Root

Unit 11: Real Life Graphs

Building blocks

- Draw distance–time and velocity–time graphs
- Draw graphs to represent real life situations
- Find the gradient of a straight line
- Find the area of a rectangle and trapezium

Key objectives

- Use graphs to calculate various measures (of individual sections), including: unit price (gradient), average speed, distance, time, acceleration
- Estimate area under a quadratic or other graph by dividing it into trapezia, rectangles or triangles
- Interpret the gradient of linear or non-linear graphs, and estimate the gradient of a quadratic or non-linear graph at a given point by sketching the tangent and finding its gradient
- Interpret the gradient of non-linear graph in curved distance–time and velocity–time graphs:
- For a non-linear distance–time graph, estimate the speed at one point in time, from the tangent, and the average speed over several seconds by finding the gradient of the chord
- For a non-linear velocity–time graph, estimate the acceleration at one point in time, from the tangent, and the average acceleration over several seconds by finding the gradient of the chord
- Interpret the gradient of a linear or non-linear graph in financial contexts
- Interpret the area under a linear or non-linear graph in real-life contexts; Interpret the rate of change of graphs of containers filling and emptying; Interpret the rate of change of unit price in price graphs.

Key words

Gradient, Estimate, Area, Rate of change, Distance, Time, Velocity, Tangent, Trapezium / Trapezia, Acceleration, Non-linear, Interpret, Average

Unit 12: Quadratic Inequalities

Building blocks

- Understand inequality notation
- Solve linear inequalities
- Factorise and solve quadratic equations
- Sketch quadratic graphs using the roots

Key objectives

- Solve quadratic inequalities in one variable, by factorising and sketching the graph to find critical values
- Represent the solution set for inequalities using set notation, i.e. curly brackets and 'is an element of' notation
- For problems identifying the solutions to two different inequalities, show this as the intersection of the two solution sets, i.e. solution of $x^2 - 3x - 10 < 0$ as $\{x: -3 < x < 5\}$
- Solve a pair of quadratic inequalities or a quadratic and a linear inequality and identify the set of solutions that satisfy both
- Solve quadratic inequalities in context

Key words

Quadratic, Inequality, Solution, Root, Satisfy, Region, Critical value, Set, Element

Unit 13: Algebraic Fractions

Building blocks

- Add, subtract, multiply and divide fractions
- Simplify algebraic expressions
- Factorise linear and quadratic expressions
- Solve quadratic equations

Key objectives

- Simplify algebraic fractions
- Add and subtract algebraic fractions
- Multiply and divide algebraic fractions
- Solve quadratic equations arising from algebraic fraction equations

Key words

Add, Subtract, Multiply, Divide, Fraction, Algebraic, Quadratic, Equation, Denominator, Numerator, Lowest Common Multiple, Lowest Common Denominator, Expand

Unit 14: Algebraic Proof

Building blocks

- Know the difference between an identity, expression, equation
- Expanding and factorising
- Rearranging Formulae

Key objectives

- Use general forms for consecutive integers (n , $n+1$)
- Use general forms for even ($2n$) and odd ($2n + 1$) numbers
- Use general forms for multiple of a number ($3n$, $4n$, $5n$ etc)
- Solve 'Show that' and proof questions using consecutive integers, squares, even numbers and odd numbers
- Use different general forms, where needed, to represent different numbers ($2m$ and $2n$)

Key words

Proof, Prove, Show that, Odd, Even, Consecutive, Square, Generalise, Identity, Expression, Integer, Factorise, Expand

Unit 15: Congruence

Building blocks

- Recognise and enlarge shapes and calculate scale factors.
- Calculate area and volume in various metric measures.
- Construct a formal proof

Key objectives

- Understand and use SSS, SAS, ASA and congruence of triangles using formal ruler and pair of compasses construct
- Solve angle problems by first proving

Key words

Congruence, Side, Angle, Length, Corresponding

Unit 16: Constructions And Loci

Building blocks

- Use a compass
- Use a protractor
- Measure accurately using a ruler
- Use 3 figure bearings
- Construct triangles

Key objectives

- Use the standard ruler and compass constructions:
- understand, from the experience of constructing them, that triangles satisfying SSS, SAS, ASA and RHS are unique, but SSA triangles are not; construct the perpendicular bisector of a given line; construct the perpendicular from a point to a line; construct the bisector of a given angle
- construct angles of 90° , 45° ; Construct:
- a region bounded by a circle and an intersecting line; a given distance from a point and a given distance from a line; equal distances from two points or two line segments; regions which may be defined by 'nearer to' or 'greater than'
- Find and describe regions satisfying a combination of loci, including in 3D
- Use constructions to solve loci problems including with bearings
- Know that the perpendicular distance from a point to a line is the shortest distance to the line.

Key words

Constructions, Construct, Compasses, Protractor, Ruler, Bisector, Bisect, Line segment, Perpendicular, Loci, Bearing, Region