Maths Curriculum Map

		Autumn term	Spring term	Summer term
Year 7	Unit of Work	Algebra Sequences Expressions & Equations Algebraic notation & substitution	Number Place value & ordering 4 operations Rounding & Estimation Statistics Averages & Range Graphing Data	Number Fractions & percentages Directed number Speed, Distance & Time Properties of Number Addition & subtraction of Fractions Geometry & Measure Perimeter & Area Angles & Polygons
	Fertile Questions	How can we use patterns to predict what comes next? What is the difference between an expression and an equation? How does a function machine model real life?	Why do we round numbers and when is an estimate good enough? What can averages tell us — and what can they hide? How do we choose the right graph to represent data?	How are fractions, decimals and percentages connected? Why do negative numbers exist and where do we use them? How do we measure and describe the world around us?
	Threshold Concepts / Key Knowledge	Sequences – describing and generating Expressions and Equations – solving equations, simplifying expressions	Place value and ordering – ordering integers and decimals, using inequality signs, rounding 4 operations – written methods integers/decimals,	Fractions and percentages – written methods, calculator methods Directed number – ordering, 4 operations, solving equations Fractions and Percentages of Amounts – Fraction of amounts, percentages of

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		Algebraic notation & substitution – function machines, substitution, representing equations	perimeter/area, converting units Rounding and Estimation – Powers of 10, Place Value, Integers, Rounding to decimal place, Standard Form, Estimation Averages & Range – Mean, Median, Mode & Range, solve problems with averages & range Graphing Data – Pictograms, Bar Charts (dual & composite), Coordinates, Scatter graphs, Correlation, Time series, non-linear relationships	amounts, use fractions/percentages to find the whole Perimeter & Area – Converting metric units, Perimeter of polygons and compound shapes, Area of Triangle & Trapezium Speed, Distance and Time – Convert units of time, fractions of time, timetables, calculate Speed, Distance and time, distance-time graphs Properties of Number – Multiples, factors, prime numbers, square, cube and triangular numbers, HCF & LCM, Venn Diagrams Addition and subtraction of Fractions – mixed and improper fractions, simplifying, calculating Angles and Polygons – notation, angle facts, angles in a triangle and quadrilateral, angles in parallel lines, solve multi-step problems
	Assessment	Continual quick testing, feedback and re-teaching throughout based on each success criteria through exit tickets and checking for understanding tasks in class. Formal written assessments end of each unit and cumulative	Continual quick testing, feedback and re-teaching throughout based on each success criteria through exit tickets and checking for understanding tasks in class. Formal written assessments end of each unit and	Continual quick testing, feedback and re-teaching throughout based on each success criteria through exit tickets and checking for understanding tasks in class. Formal written assessments end of each unit and cumulative assessments at the end of each term.

		Autumn term	Spring term	Summer term
		assessments at the end of each term.	cumulative assessments at the end of each term.	
	Experiences/ Purposeful Fun	Whiteboard races (WRMB) Bingo Codebreakers Card matching / sorting tasks Domino chains Relay races Sequence investigation: predicting the 100th term Function machine challenges with real-life contexts	Whiteboard races (WRMB) Bingo Codebreakers Card matching / sorting tasks Domino chains Relay races Averages investigation using real class data Scatter graph analysis using sports statistics	Whiteboard races (WRMB) Bingo Codebreakers Card matching / sorting tasks Domino chains Relay races Fraction wall exploration activities Angle facts treasure hunt around the classroom
	Skills	Applying pupils' understanding and concept of number to algebraic scenarios	Understanding integers/non-integers and using these in calculations Using formal written methods Using negative numbers	Understanding, using and calculating with fractions Understanding basic angle facts and applying these to irregular shapes Knowing types of number and using these in calculations
	Has links to... (prior and future)	Prior: KS2 number, arithmetic, basic geometry Future: Y8 algebraic manipulation, coordinates and graphs	Prior: KS2 place value, multiplication, division Future: Y8 proportional reasoning, standard form, statistics	Prior: KS2 fractions, decimals, percentages, basic angles Future: Y8 fractions, Y9 percentages, angles in polygons
	Cultural/contextual knowledge	Algebra has roots in ancient Islamic mathematics — the word 'algebra' comes from Al-Khwarizmi's 9th century text 'Al-Kitab al-mukhtasar fi hisab al-jabr' Patterns and sequences appear in Islamic geometric art, nature (Fibonacci) and architecture	The concept of zero as a number was developed in ancient India Statistics were used by Florence Nightingale to save lives — her 'rose diagrams' changed hospital policy Averages are used daily in sport, medicine, finance and government	Ancient Egyptians used unit fractions; fractions appear in music (time signatures), cooking and construction. Negative numbers were first used in China and India — European mathematicians resisted them for centuries. Angles and geometry underpin Islamic tiling, Gothic architecture and modern engineering
	Careers links	Sequences and patterns → Computer programmer, game developer Function machines → Engineer, manufacturing technologist Algebra → Any STEM career pathway	Place value & estimation → Financial analyst, accountant Averages & statistics → Sports analyst, market researcher, epidemiologist	Fractions & percentages → Nurse (medication dosage), retail manager, chef Speed, distance & time → Transport planner, logistics manager, pilot

		Autumn term	Spring term	Summer term
			Graphing data → Journalist, data scientist, healthcare analyst	Angles & polygons → Architect, game designer, structural engineer
	Literacy elements	Key vocabulary: sequence, term, expression, equation, formula, variable, substitute, simplify, expand, factorise, function, input, output	Key vocabulary: integer, decimal, estimate, round, significant figure, mean, median, mode, range, correlation, frequency, pictogram	Key vocabulary: numerator, denominator, improper, mixed number, percentage, directed number, perimeter, area, composite, parallel, transversal, interior, exterior

		Autumn term	Spring term	Summer term
Year 8	Unit of Work	Ratio Proportion and scale Algebraic manipulation Coordinates and graphs Multiply and divide fractions Symmetry and reflection	Area, volume and density Equations and inequalities Percentages Indices Standard form Interpret and represent data	Angles in parallel lines and polygons Tables and probability Circles Graphs and charts Sequences
	Fertile Questions	How do we use ratio and proportion to scale things up or down in real life? How does the equation of a line describe a relationship between two variables? What is the difference between an equation, an expression and an identity?	How do we calculate what we cannot directly measure? Why are index laws useful and where do we see very large or very small numbers in real life? How do we know if data is reliable?	How do parallel lines create equal angles — and why does this matter? How certain or uncertain is an event — and how do we measure that? Why is pi so important and where does it appear in the real world?
	Threshold Concepts / Key Knowledge	Ratio – understand, simplify, solve problems (whole/part/difference given), express as 1:n, compare ratios and fractions Proportion and scale – direct proportion, conversion graphs, currencies, similar shapes, metric units, scale diagrams and maps Algebraic manipulation – form expressions, formulae/expressions/identities/equations, simplify, directed number, substitution, expand/factorise single bracket, expand double brackets (E)	Area, volume and density – 2D and 3D shapes, area of compound shapes, prisms, volume of cubes/cuboids, metric units, density mass volume Equations and inequalities – 1 and 2-step equations, complex and fractional equations, unknowns on both sides, inequalities on number lines, form and solve Percentages – percentage of amount, multipliers, increase/decrease, percentage change, find original value	Angles in parallel lines and polygons – basic angle rules, parallel lines, alternate/corresponding/co-interior angles, quadrilateral properties, exterior/interior angles of polygons, geometric proof (E) Tables and probability – probability vocabulary and scale, single event, sum = 1, experiments, sample spaces, two-way tables, frequency trees Circles – vocabulary, pi as ratio, circumference, area, perimeter and area of compound shapes with circles

		Autumn term	Spring term	Summer term
		Coordinates and graphs – four quadrants, lines parallel to axes, tables of values, y=mx, gradients, y=x+c, y=mx+c, midpoints (E) Multiply and divide fractions – multiply/divide fractions and mixed numbers, reciprocals, algebraic fractions (E) Symmetry and reflection – line and rotational symmetry, reflect in horizontal/vertical/diagonal lines	Indices – index laws (add/subtract/multiply/divide), powers of powers (E), negative and fractional indices (E) Standard form – positive/negative powers of 10, convert to/from standard form, calculator use Interpret and represent data – types of data, outliers, averages and range, compare distributions, frequency tables, grouped data	Graphs and charts – pictograms, bar charts, vertical line charts, pie charts, line graphs, misleading graphs, compare distributions Sequences – generate and describe sequences, nth term of linear sequence
	Assessment	Continual quick testing, feedback and re-teaching throughout based on each success criteria through exit tickets and checking for understanding tasks in class. Formal written assessments end of each unit and cumulative assessments at the end of each term.	Continual quick testing, feedback and re-teaching throughout based on each success criteria through exit tickets and checking for understanding tasks in class. Formal written assessments end of each unit and cumulative assessments at the end of each term.	Continual quick testing, feedback and re-teaching throughout based on each success criteria through exit tickets and checking for understanding tasks in class. Formal written assessments end of each unit and cumulative assessments at the end of each term.
	Experiences/ Purposeful Fun	Whiteboard races (WRMB) Bingo Codebreakers Card matching / sorting tasks Domino chains Relay races Ratio and scale: scale drawing of the classroom or school Graph plotting investigation: who has the steepest line?	Whiteboard races (WRMB) Bingo Codebreakers Card matching / sorting tasks Domino chains Relay races Density practical: calculating density of classroom objects Percentage auction game — bidding with imaginary budgets	Whiteboard races (WRMB) Bingo Codebreakers Card matching / sorting tasks Domino chains Relay races Probability experiments: coins, dice, spinners — predicted vs actual Circle investigation: measuring pi with physical circles
	Skills	Understanding and applying ratio for proportional reasoning Manipulating algebraic expressions and solving equations Plotting and interpreting straight line graphs	Calculating with area, volume and density Using index laws and standard form Interpreting and comparing statistical data	Applying angle facts to polygons and parallel lines Calculating with circles Calculating probability from diagrams and tables
	Has links to... (prior and future)	Prior: Y7 fractions, expressions, equations, coordinates Future: Y9 ratio and proportion, similarity, straight line graphs	Prior: Y7 perimeter and area, Y8 Autumn fractions Future: Y9 area and volume, percentages, equations and formulae	Prior: Y7 angles, Y8 Spring equations Future: Y9 Pythagoras, transformations, probability with Venn diagrams

		Autumn term	Spring term	Summer term
	Cultural/contextual knowledge	Scale drawing has been used since ancient Egypt — the Great Pyramid was built using precise proportional plans Map scales and ratio are used by the Ordnance Survey and Google Maps The golden ratio (1:1.618) appears in art, architecture and nature	Archimedes calculated pi and the volume of a sphere in 250 BC Density is fundamental to understanding materials — used by aerospace and materials engineers Standard form is used by scientists to express the size of atoms and the distance between galaxies	Islamic geometric art is built entirely on angle rules and circle geometry Probability was formalised by Pascal and Fermat in the 17th century through gambling problems Pie charts were invented by William Playfair in 1801 — data visualisation has transformed decision-making
	Careers links	Ratio & proportion → Chef/ nutritionist (scaling/ recipes), quantity surveyor Algebraic manipulation → Software engineer, mechanical engineer Coordinates and graphs → Architect, data analyst, air traffic controller	Area, volume and density → Civil engineer, packaging designer, pharmacist Percentages → Accountant, financial advisor, retail manager Statistics & data → Epidemiologist, market researcher, sports scientist	Angle geometry → Surveyor, games developer, aerospace engineer Probability → Actuary, insurance underwriter Circles → Mechanical engineer, product designer
	Literacy elements	Key vocabulary: ratio, proportion, scale factor, reciprocal, gradient, intercept, coefficient, identity, expression, formula, symmetry, reflection	Key vocabulary: density, mass, volume, prism, compound, inequality, multiplier, percentage change, index, standard form, frequency, distribution	Key vocabulary: alternate, corresponding, co-interior, transversal, polygon, exterior, interior, probability, outcome, event, circumference, arc, sector

		Autumn term	Spring term	Summer term
Year 9	Unit of Work	Properties of number Percentages Area and volume Equations, inequalities and formulae Fractions Rates Standard form	Maths and money Straight line graphs Ratio and proportion Constructions and congruence Similarity Algebraic manipulation	Pythagoras' theorem Non-linear graphs Probability Transformations Simultaneous equations Trigonometry
	Fertile Questions	How do prime numbers underpin internet security? How does compound interest affect long-term savings and debt? How do scientists express and work with very large and very small numbers?	How does maths help us manage money and make financial decisions? How can a straight line model a real-life relationship? What makes two shapes congruent rather than just similar?	How did ancient civilisations calculate distances they couldn't physically measure? How does a graph's shape tell us about the relationship it models? How likely is it — and how do we calculate the probability of combined events?

		Autumn term	Spring term	Summer term
	Threshold Concepts / Key Knowledge	Properties of number – factors/multiples/primes, product of prime factors, HCF & LCM, Venn diagrams, integers/rational numbers, introduction to surds (E) Percentages – increase/decrease, express change as %, reverse percentages, repeated percentage change, simple and compound interest Area and volume – nets, area of 2D shapes and circles, surface area, volume of prisms/cylinders/cones/pyramids/spheres (E), metric unit conversions Equations, inequalities and formulae – solve equations/inequalities (with brackets, negatives, unknowns on both sides), change the subject (E) Fractions – add/subtract/multiply/divide fractions, fraction of an amount Rates – speed, distance and time, distance-time graphs, rates of change and their units Standard form – convert and compare, multiply/divide in standard form	Maths and money – bank accounts, VAT, ways to pay/save, jobs and pay, investing, borrowing, budgeting, insurance, spending overseas Straight line graphs – parallel lines, gradients, intercepts, y=mx+c, equation from a graph, interpret real-life graphs, graph inequalities (E) Ratio and proportion – direct and inverse proportion, conversion graphs, ratio problems with algebra (E) Constructions and congruence – draw and measure angles, scale drawings, construct triangles (ASA/SAS/SSS), angle/perpendicular bisectors, loci, congruent triangles Similarity – recognise enlargement, find unknown lengths/angles, similar triangles, ratio in right-angled triangles (E) Algebraic manipulation – expand/factorise single bracket, expand double brackets, use identities, factorise quadratics (E), solve quadratics (E)	Pythagoras' theorem – solve equations with squares/roots, find hypotenuse, find any side, use on coordinate axes, 3D Pythagoras (E) Non-linear graphs – draw and interpret quadratic/cubic/reciprocal/exponential graphs, roots/intercepts/turning points (E) Probability – sets and Venn diagrams, single event, relative frequency, expected outcomes, independent events, probabilities from Venn diagrams Transformations – enlargement (positive/fractional/negative scale factors), rotation, translation, reflection, series of transformations (E) Simultaneous equations – graphical and algebraic methods, substitution (E) [optional, revisited Y10] Trigonometry – SOHCAHTOA, find unknown sides and angles [optional, revisited Y10]
	Assessment	Continual quick testing, feedback and re-teaching throughout based on each success criteria through exit tickets and checking for understanding tasks in class. Formal written assessments end of each unit and cumulative assessments at the end of each term.	Continual quick testing, feedback and re-teaching throughout based on each success criteria through exit tickets and checking for understanding tasks in class. Formal written assessments end of each unit and cumulative assessments at the end of each term.	Continual quick testing, feedback and re-teaching throughout based on each success criteria through exit tickets and checking for understanding tasks in class. Formal written assessments end of each unit and cumulative assessments at the end of each term.
	Experiences/ Purposeful Fun	Whiteboard races (WRMB) Bingo Codebreakers Card matching / sorting tasks Domino chains	Whiteboard races (WRMB) Bingo Codebreakers Card matching / sorting tasks Domino chains	Whiteboard races (WRMB) Bingo Codebreakers Card matching / sorting tasks Domino chains

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		Relay races Compound interest investigation: savings vs debt over 10 years Prime number sieve activity (Sieve of Eratosthenes)	Relay races Personal budget planning task using real salary and cost of living data Congruence and construction: design a geometric logo using compass and ruler	Relay races Pythagoras outdoor activity: measuring inaccessible distances on the school field Transformation art: creating patterns using reflections and rotations
	Skills	Using number properties and surds in calculations Applying percentage and interest calculations Calculating with area, volume and rates	Applying financial maths to real-life contexts Plotting and interpreting straight line graphs Constructing and reasoning about geometric figures	Using Pythagoras' theorem in 2D and 3D contexts Interpreting non-linear graphs Calculating and applying probability
	Has links to... (prior and future)	Prior: Y8 indices, standard form, fractions, percentages Future: Y10 quadratics, surds, factors and powers	Prior: Y8 coordinates and graphs, ratio, algebraic manipulation Future: Y10 straight line graphs, simultaneous equations, similarity and congruence	Prior: Y8 symmetry and reflection, Y9 Spring similarity Future: Y10 Pythagoras, trigonometry, probability trees, vectors
	Cultural/contextual knowledge	Prime numbers underpin RSA encryption — every secure website uses them Compound interest was described by mathematicians in ancient India and the Islamic Golden Age Surds were considered 'irrational' and philosophically troubling by ancient Greek mathematicians	The concept of a budget and financial planning dates to ancient Mesopotamia — clay tablets recorded debts and loans Descartes invented the coordinate system in the 17th century, reportedly inspired by watching a fly on the ceiling The word 'congruent' comes from Latin meaning 'to agree' — used in law, philosophy and mathematics	Pythagoras' theorem was known in Babylon and Egypt 1000 years before Pythagoras Trigonometry was developed by Islamic and Indian mathematicians and used for astronomy and navigation Probability theory emerged in 17th century France from Pascal and Fermat's correspondence about gambling
	Careers links	Properties of number & surds → Cryptographer, software developer Percentages & compound interest → Financial advisor, bank manager, mortgage broker Area and volume → Civil engineer, architect, 3D product designer	Maths and money → Personal finance advisor, accountant, economist Straight line graphs → Data scientist, transport planner, physicist Ratio and proportion → Pharmacist (dilutions), chef, materials scientist	Pythagoras' theorem → Surveyor, structural engineer, electrician Probability & Venn diagrams → Actuary, data analyst, medical researcher Trigonometry → Architect, aerospace engineer, robotics engineer
	Literacy elements	Key vocabulary: prime, factor, multiple, HCF, LCM, rational, irrational, surd, compound interest, reverse percentage, surface area, volume, rate of change	Key vocabulary: VAT, interest, budget, gradient, intercept, proportion, inverse, congruent, bisector, locus, enlargement, similar, scale factor	Key vocabulary: hypotenuse, square root, Pythagoras, quadratic, reciprocal, exponential, Venn diagram, relative frequency, transformation, invariant, simultaneous

		Autumn term	Spring term	Summer term
Year 10	Unit of Work	Algebra Algebraic Manipulation Equations, Identities & Formulae Quadratic expressions and equations Number Percentages Work with Fractions Ratio and Proportion Number Non-Calculator Methods Rounding & Estimation	Algebra Straight line graphs Non-linear graphs (H) Probability Geometry & Measure Perimeter, area & volume Statistics Interpret & represent data	Geometry & Measure Angles Vectors (H) Pythagoras theorem & trigonometry Statistics Graphs & diagrams Number Factors, Powers & Surds (H) Algebra Simultaneous equations
	Threshold Concepts / Key Knowledge	Algebraic Manipulation – Substitution, Collecting like terms, Indices, expand a single bracket, factorise into a single bracket Equations, Identities & Formulae – Solve equations, understand and solve inequalities, change the subject of formula Quadratic expressions and equations – Expand double brackets, factorise quadratic expressions, Solve quadratic equations, quadratic graphs, Completing the square (H), Quadratic formula (H) Percentages – Percentage of amounts, Interest, Percentage	Straight line graphs – Plot straight line graphs, y=mx+c, gradients, equation of a line, midpoints, equation of a line given 2 points, parallel & perpendicular gradients (H) Non-linear graphs (H) – Quadratic & Cubic graphs, intercepts & roots, area under a curve (H), equation of a circle (H), tangents to a circle (H) Probability – Probability of single events, relative frequency, Sample space diagrams, two-way tables, frequency trees, tree diagrams, dependent/independent events, conditional probability (H) Perimeter, area & volume – 2D & 3D shapes, area and perimeter of 2D shapes, area of compound shapes, area & circumference of circles, volume of prisms, surface area of prisms	Angles – Basic angle facts, angles in triangles & quadrilaterals, interior/exterior angles, angles in parallel lines Vectors (H) – Vector notation, translate by a vector, multiply/add & subtract vectors, vector proof (H) Pythagoras theorem & trigonometry – find the hypotenuse, find shorter lengths using Pythagoras, SOHCAHTOA, 3D Pythagoras & trigonometry (H), Sine/Cosine & Area of triangle rules (H), exact trigonometric values (H) Graphs & diagrams – Pie Charts, Frequency Polygons, Stem & Leaf, Histograms (H), Cumulative frequency (H), Box Plots (H) Factors, Powers & Surds (H) – Indices, Simplifying surds (H), arithmetic with surds (H), rationalising the denominator (H)

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		increase/decrease, compound interest Work with Fractions – Fractions of amounts, increase/decrease by a fraction, 4 operations with fractions, solve problems with fractions, algebraic fractions (H) Ratio & Proportion – Equivalent Ratio, Sharing in a Ratio, links with ratio & fraction, combining ratios Non-Calculator Methods – Place value, directed number, order of operations Rounding & Estimation – Round to decimal places & significant figures, estimation, error intervals, calculator use, bounds (H)	Interpret & represent data – Averages & Range, averages from a table, sampling, scatter graphs, capture/recapture (H)	Simultaneous equations – Solve simultaneous equations using algebra, solve using a graph, quadratic & linear simultaneous equations (H), linear & equation of a circle (H)
	Assessment	Continual quick testing, feedback and re-teaching throughout based on each success criteria through exit tickets and checking for understanding tasks in class. Formal written assessments end of each unit and cumulative assessments at the end of each term.	Continual quick testing, feedback and re-teaching throughout based on each success criteria through exit tickets and checking for understanding tasks in class. Formal written assessments end of each unit and cumulative assessments at the end of each term.	Continual quick testing, feedback and re-teaching throughout based on each success criteria through exit tickets and checking for understanding tasks in class. Formal written assessments end of each unit and cumulative assessments at the end of each term.
	Skills	Scale Factors – Work with similarity & congruence Use properties of similar shapes to apply trigonometry Plot & represent solutions on graphs	Find values of missing angles, bearings Use properties of circles Solve vector problems Work with fractions, decimals and percentages Calculate interest Represent and calculate probability	Collect, represent and interpret data Surds Non-calculator methods for calculations Factors & multiples Standard form & indices

		Autumn term	Spring term	Summer term
		Find solutions to simultaneous equations		
	Has links to... (prior and future)	Prior: Y9 algebraic manipulation, quadratics, percentages, ratio Future: Y11 sequences and proof, functions, simultaneous equations	Prior: Y9 straight line graphs, non-linear graphs, probability, area and volume Future: Y11 functions and graphs, rates, circle theorems (H)	Prior: Y9 Pythagoras, trigonometry, transformations Future: Y11 similarity, vectors (H), angles and bearings, constructions and loci
	Cultural/contextual knowledge	Quadratic equations were solved by ancient Babylonians using geometric methods 4000 years ago Al-Khwarizmi wrote the first systematic treatment of quadratic equations in the 9th century The quadratic formula appears in engineering, physics and economics	Probability theory transformed insurance, finance and medicine in the 18th and 19th centuries Histograms were invented by Karl Pearson in 1895 and remain fundamental to data science Circles and their equations are used in GPS systems, radar and medical imaging	Pythagoras' theorem is used in construction, navigation and computer graphics every day Vectors were developed in the 19th century and are foundational to physics, robotics and 3D graphics Surds arise naturally in geometry — the diagonal of a unit square is exactly $\sqrt{2}$, proved irrational by Hippasus
	Careers links	Quadratic equations & algebra → Software engineer, physicist (projectile modelling), cryptographer Percentages & fractions → Accountant, financial analyst, pharmacist Ratio and proportion → Quantity surveyor, nutritionist, economist	Straight line & non-linear graphs → Data scientist, economist (trend modelling), engineer Probability → Actuary, insurance analyst, medical researcher (clinical trials) Area, volume & perimeter → Architect, civil engineer, product designer	Trigonometry & Pythagoras → Surveyor, aerospace engineer, electrician Vectors (H) → Robotics engineer, games developer, physicist Surds & indices (H) → Mathematician, computer scientist, materials scientist
	Literacy elements	Key vocabulary: quadratic, factorise, expand, inequality, identity, formula, subject, completing the square (H), discriminant (H), bounds (H), algebraic fraction (H)	Key vocabulary: perpendicular, gradient, intercept, tangent, sector, arc, frequency density (H), cumulative frequency (H), quartile (H), conditional probability (H)	Key vocabulary: vector, scalar, resultant, hypotenuse, adjacent, opposite, sine, cosine, tangent, surd (H), rationalise (H), histogram (H), box plot (H)

		Autumn term	Spring term	Summer term
Year 11	Unit of Work	Ratio and proportion Area and volume Similarity and congruence Sequences and proof Standard form Circle theorems (H) / Work with circles (F) Set notation and Venn diagrams Vectors (H)	Functions and graphs Equations and formulae Rates Angles, bearings and trigonometry Constructions and loci Transformations	Revision and exam preparation Past paper practice GCSE examinations
	Threshold Concepts / Key Knowledge	Ratio and proportion – solve ratio problems, best buy, conversion graphs, exchange rates, direct/inverse proportion equations and graphs Area and volume – plans and elevations, volume of sphere/cones/pyramids/cylinders, surface area, metric unit conversions Similarity and congruence – similar shapes, unknown sides/angles, areas/volumes of similar shapes (H), congruent triangles, proof (H) Sequences and proof – arithmetic/geometric sequences, nth term of linear (and quadratic H), algebraic proof and arguments Standard form – convert, order, four operations in standard form Circle theorems (H) / Work with circles (F) – arc length, sector area, compound circle problems; circle theorems and proofs (H) Set notation and Venn diagrams – Venn diagrams, set notation,	Functions and graphs – function machines, notation, composite and inverse functions (H), quadratic/cubic/reciprocal/exponential/trig graphs, transformations of graphs (H) Equations and formulae – form/solve equations and inequalities, quadratic equations (H), iteration (H), simultaneous equations (linear + non-linear H) Rates – speed/distance/time, distance-time graphs, velocity-time graphs (H), density and pressure, compound units Angles, bearings and trigonometry – bearings, Pythagoras, SOHCAHTOA, sine/cosine rules (H), problems with parallel lines Constructions and loci – construct triangles/polygons/bisectors, perpendiculars, loci problems Transformations – enlargement (positive/fractional/negative scale factors H), reflection, rotation, translation, invariant points (H)	Targeted revision of weak topics identified from mock examinations Past paper practice under timed conditions GCSE Paper 1, 2 and 3 examinations

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		probability from Venn diagrams, conditional probability (H) Vectors (H) – solve problems, ratio with vectors, collinear points, geometric proofs		
	Assessment	Continual quick testing and re-teaching throughout based on success criteria. Formal biweekly mini mocks. Full mock examinations in November and March. Targeted intervention based on mock analysis.	Continual quick testing and re-teaching throughout based on success criteria. Formal biweekly mini mocks. Full mock examinations in November and March. Targeted intervention based on mock analysis.	Final revision lessons and exam preparation. GCSE examinations.
	Skills	Using proportional reasoning in complex problems Applying volume and surface area to unfamiliar 3D shapes Proving geometric and algebraic results formally	Using function notation and working with composite/inverse functions (H) Solving complex equations including quadratics and simultaneous Applying trigonometry including sine/cosine rules (H)	Applying all mathematical skills across multi-step exam questions Working accurately under timed conditions Selecting appropriate methods for unseen problems
	Has links to... (prior and future)	Prior: Y10 ratio, area and volume, sequences, standard form, circle geometry, probability Future: Post-16 maths, A-Level topics in proof, circles and vectors	Prior: Y10 straight line and non-linear graphs, equations, trigonometry, transformations Future: A-Level functions, mechanics (rates), Further Maths	Prior: All KS3 and KS4 content Future: A-Level Mathematics and Further Mathematics, BTEC/T-Level STEM pathways
	Cultural/contextual knowledge	Circle theorems were proved by Euclid in 300 BC — one of the oldest bodies of formal mathematical proof still taught today Vectors were developed independently by Hamilton and Grassmann in the 19th century and now underpin physics, computing and robotics Algebraic proof connects to formal logic used in computer science and philosophy	The sine and cosine rules were developed by Islamic mathematicians in the 10th century for astronomical calculations Functions as a formal concept were introduced by Leibniz and Euler — now fundamental to all of modern mathematics Bearings and navigation were critical to the Age of Exploration and remain essential in aviation and maritime travel	GCSE Mathematics gives access to over 70% of A-Level subjects and is required for most degree programmes Mathematical literacy is consistently ranked by employers as one of the most valued transferable skills The history of exam culture in mathematics dates to 19th century Cambridge, where the Mathematical Tripos was the most prestigious qualification in Britain

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	Careers links	Ratio and proportion → Pharmacist, economist, quantity surveyor Area and volume → Architect, civil/structural engineer, product designer Circle theorems & geometry (H) → Mechanical engineer, aerospace engineer, surveyor Algebraic proof (H) → Mathematician, theoretical physicist, computer scientist	Functions and graphs → Data scientist, economist, software engineer Trigonometry & bearings → Pilot, naval officer, surveyor, robotics engineer Rates (speed/density/pressure) → Physicist, logistics manager, materials scientist	All topics → Any STEM career pathway requires GCSE Maths grade 4+ Problem-solving under pressure → Finance, medicine, engineering, computing Post-16: A-Level Maths opens doors to actuarial science, engineering, economics, data science
	Literacy elements	Key vocabulary: conjecture, proof, counterexample, theorem, collinear, congruent, similar, arc, sector, set notation, intersection, union, complement, vector (H)	Key vocabulary: function, composite, inverse, iteration, velocity, bearing, locus, bisector, invariant, transformation, sine rule (H), cosine rule (H)	Key vocabulary: All prior vocabulary consolidated Exam language: hence, show that, prove, sketch, describe fully, give reasons, exact value