

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
YEAR 7	Using technology e.g. calculators, appropriately					
	<p>Geometry basics</p> <ul style="list-style-type: none"> Line segment and angle notation Using a ruler and a protractor Drawing and measuring angles Perpendicular and parallel lines Types of triangles Types of quadrilaterals Regular and irregular polygons Constructing triangles (and more complex polygons) <p>Directed Numbers</p> <ul style="list-style-type: none"> Understanding positive and negative numbers Ordering directed numbers Calculations with directed numbers <p>Algebra basics</p> <ul style="list-style-type: none"> Function machines Algebraic vocabulary and notation Writing expressions Substitution Equality vs Equivalence Like and unlike terms (Solving one- / two-step linear equations) 	<p>Order of Operations & Integer Arithmetic</p> <ul style="list-style-type: none"> Four operations and their common methods Multiplication tables and associated division facts Order of operations including directed numbers (and/or algebraic expressions) <p>Place Value & Decimal Arithmetic</p> <ul style="list-style-type: none"> Ordering, writing and comparing positive integers and decimals Number lines Rounding Using inequality symbols Multiplying & dividing by powers of 10 Money & finance Order of operations revisited <p>Powers & Roots</p> <ul style="list-style-type: none"> Square and cube numbers Powers including power of 0 Roots (Bounds of roots) 	<p>Multiples & Factors</p> <ul style="list-style-type: none"> Common multiples and LCM Common factors and HCF Factors of numbers and expressions <p>Fractions 1</p> <ul style="list-style-type: none"> Concept of a fraction Equivalent fractions including simplifying Ordering & comparing fractions Fractions and decimals Fractions and division (Fractions above 1) Fraction of an amount Proper, improper fractions and mixed numbers Adding and subtracting fractions 	<p>Percentages</p> <ul style="list-style-type: none"> Concept of a percentage Simple FDP conversions Percentage of an amount (Percentages above 100%) <p>Perimeter & Area</p> <ul style="list-style-type: none"> Perimeter Area of rectangles and parallelograms Area of triangles (Area of trapezia) (Area problems involving algebra) 	<p>Angle basics</p> <ul style="list-style-type: none"> Angles are a point Adjacent angles on a straight line Vertically opposite angles Sum of angles in a triangle Sum of angles in a quadrilateral Complex angle problems (Angle sum of any polygon) <p>Measures inc. Time</p> <ul style="list-style-type: none"> Measures – using and converting metric units Measures of length Measures of weight Measures of capacity Time and the calendar Decimal time (Metric units of area) (Metric units of volume) 	<p>Proportional Reasoning</p> <ul style="list-style-type: none"> Direct proportion problems, e.g. best buys, value for money Conversion (linear) graphs Exchange rates (Direct proportion graphs) (Metric to imperial) <p>The Cartesian Grid</p> <ul style="list-style-type: none"> Plotting 2D coordinates in all four quadrants Defining lines parallel to the axes (Mid-point of a line segment) (Problem-solving diagrams drawn on a cartesian grid) <p>Algebra & Graphs</p> <ul style="list-style-type: none"> Sketching graphs using a table of values Real-life graphs Linear graphs: $y = mx + c$ and their properties Parallel & perpendicular lines on a graph and their properties (Exploring non-linear graphs) <p>Averages</p> <ul style="list-style-type: none"> Finding the midpoint of two numbers Mode & median Range of a dataset Mean (Reverse mean problems) (Finding missing values)
	Topics in brackets are bridging topics which are covered in depth in future units					

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YEAR 8	Using technology e.g. calculators, appropriately					
	<p>Venns</p> <ul style="list-style-type: none"> Interpret and represent sets Interpret and create Venn diagrams Intersection of sets Union of sets (Complement of sets) (Venn diagrams showing more than 2 sets) <p>Fractions 2</p> <ul style="list-style-type: none"> Fractions above 1 Multiplication and division of fractions, improper fractions and mixed numbers Express one numbers as a fraction of another (Fractions in algebraic context) (Algebraic fractions) <p>Prime Factorisation</p> <ul style="list-style-type: none"> Multiples, factors and primes Prime factors Product of primes Use prime factors to find HCF / LCM (Use Venn diagrams to find HCF / LCM) 	<p>Simplifying Expressions</p> <ul style="list-style-type: none"> Simplifying expressions, e.g. collecting like terms Expanding brackets Factorisation (Expand a pair of binomials) (Algebraic fractions) <p>Number Sense & Estimation</p> <ul style="list-style-type: none"> Rounding Associativity and Commutativity Using strategies and known facts to solve problems Estimation (Truncation vs Rounding) <p>Ratio Basics</p> <ul style="list-style-type: none"> Ratio notation Simplifying ratios Unit ratios Expressing fractions as ratios Dividing a quantity into a ratio (Understand gradient of a line as a ratio) <p>Volume of prisms</p> <ul style="list-style-type: none"> Names and properties of prisms Volumes of cubes and cuboids Volumes of prisms 	<p>Solving linear equations and inequalities</p> <ul style="list-style-type: none"> One-step equations Two-step equations Solving equations Forming and solving equations with brackets Solving inequalities Stating true values for an inequality Formulae, expressions, identities and equations <p>Transformations</p> <ul style="list-style-type: none"> Line symmetry Reflection Rotational symmetry Rotation Translations (Combining transformations) 	<p>Enlargement & Similarity</p> <ul style="list-style-type: none"> Similar shapes Congruent shapes Scale factors Scale diagrams Map reading Enlargement (Enlargements from a point) (Negative and fractional scale factors) <p>Sequences</p> <ul style="list-style-type: none"> Recognise simple geometric sequences Describe sequences Find next term Term-to-term rule Position-to-term rule Find missing terms Generate terms of a sequence from term-to-term and position to term rules Linking graphs (Find n^{th} term) 	<p>2D Shapes & 3D Solids</p> <ul style="list-style-type: none"> Properties of shapes / solids Nets Area of 2D shapes Surface area of 3D solids Sum of exterior and interior angles Missing angle problems <p>Circles & Trapezia: Perimeter, Area, Volume</p> <ul style="list-style-type: none"> What is pi? Area of a trapezium Area of circles Circumference of circles Compound shapes <p>Statistics</p> <ul style="list-style-type: none"> Interpreting tables and graphs Interpreting different types of graphs Using the most appropriate diagrams and/or averages Outliers 	<p>Pie charts and Scatter graphs</p> <ul style="list-style-type: none"> Pie charts Correlation Scatter graphs <p>FDP (Fractions, Decimals & Percentages)</p> <ul style="list-style-type: none"> FDP conversion Percentage increase / decrease using a multiplier Expressing one number as a fraction or percentage of another Find the original amount from a percentage <p>Data Handling</p> <ul style="list-style-type: none"> Statistical enquiry Averages, spread & outliers Using appropriate diagrams for a dataset Misleading graphs <p>Probability</p> <ul style="list-style-type: none"> Systematic listing Probability notation including the Probability Scale Sample spaces Calculating probability
	Topics in brackets are bridging topics which are covered in depth in future units					

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YEAR 9	<p>Number Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Standard Form • Product rule for counting (H) <p>Rounding, Estimation and Accuracy Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Truncation • Error intervals • Upper and lower bounds (H) <p>Factors, Multiples and Primes Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Problems with HCF/LCM <p>Fractions Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Recurring decimals to fractions (H) 	<p>Powers and Roots Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Negative integer powers • Unit fraction powers (H) <p>Algebra Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Index law problems which include use of zero, fractional and negative powers. <p>3D Shapes and the 2D Representations Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Planes of symmetry • 2D isometric representations • Plans and elevations <p>Perimeter and Area Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Surface area • Problems involving algebra 	<p>Sequences Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Nth Term • Quadratic sequences <p>Percentages Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Compound interest (H) • Reverse percentages (H) <p>Ratio Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Difference problems • Combining ratios • Ratio, percentage, and fraction problems • Ratio as a linear function (H) 	<p>Proportion Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Direct and inverse proportion problems • Set up and use equations to solve proportion problems (H) <p>Shape Properties and Angles Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Multistep problems • Problems involving algebra <p>Scale Drawing and Bearings</p> <ul style="list-style-type: none"> • Bearings • Problems involving angle facts and bearings 	<p>Area and Circumference of a Circle Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Length of an arc • Area of a sector <p>Compound Measures</p> <ul style="list-style-type: none"> • Solve problems involving Speed, Density and Pressure formulae • Plot and interpret Distance-Time and Velocity-Time graphs <p>Equations and Formulae Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Solving equations with unknowns on both sides. • Forming equations using angle facts, perimeter, area. <p>Pythagoras' Theorem</p> <ul style="list-style-type: none"> • Understand and use Pythagoras' theorem • Show that a triangle is right angled • Use Pythagoras' theorem in 3D (H) 	<p>Coordinates and Linear Graphs Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Calculating gradients • Graphs of the form $ax + by = c$ • Equations of parallel lines • Equations of perpendicular lines (H) <p>Quadratics</p> <ul style="list-style-type: none"> • Expand the product of two linear expressions • Factorise expressions of the form $x^2 + bx + c$ • Use the difference of two squares • Factorise expressions of the form $ax^2 + bx + c$ (H) • Write expressions in completing the square form $(x + a)^2 + b$ (H) • Expand the product of more than two linear expressions (H)

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YEAR 10	<p>Representing Data Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Frequency polygons • Stem and Leaf diagrams • Comparing distributions using charts • Interpolation and extrapolation • Causality • Time series graphs (H) <p>Summarising Data</p> <ul style="list-style-type: none"> • Compare distributions • Calculate averages from charts • Find the median, quartiles and interquartile range (H) <p>Quadratic Graphs</p> <ul style="list-style-type: none"> • Lines of symmetry, roots, intercepts and turning points • Sketching quadratic and cubic graphs (H) 	<p>Transformations Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Enlargement from a point • Fractional scale factors • Negative scale factors (H) • Combinations <p>Congruence and Similarity</p> <ul style="list-style-type: none"> • Recognise congruent shapes • Use congruence to find missing sides and angles • Use similarity to find missing sides and angles • Prove congruence and similarity (H) • Use similarity to find missing lengths, areas and volumes (H) <p>Trigonometry</p> <ul style="list-style-type: none"> • Understand the trigonometric ratios • Work out missing sides and angles in right angled triangles • Know and use exact values of key angles • Use trigonometry in 3D shapes (H) 	<p>Percentages Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Compound interest • Reverse percentages • Growth and Decay <p>Volume and Surface Area Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Cones • Frustums • Pyramids • Spheres <p>Circle Theorems (H)</p> <ul style="list-style-type: none"> • Use and apply circle theorems to find missing angles • Prove circle theorems <p>Surds (H)</p> <ul style="list-style-type: none"> • Simplify a surd • Simplify expressions involving surds • Rationalise the denominator 	<p>Solving Quadratic Equations</p> <ul style="list-style-type: none"> • Solve equations of the form $x^2 + bx + c$ by factorising • Find approximate solutions graphically • Solve equations of the form $ax^2 + bx + c$ by factorising (H) • Use completing the square (H) • Use the quadratic formula (H) <p>Inequalities Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Representing on a number line • Solve linear inequalities • Use set notation to represent solution (H) • Represent inequalities graphically (H) • Solve quadratic inequalities (H) <p>Simultaneous Equations</p> <ul style="list-style-type: none"> • Write equations to represent situations • Solve linear by substitution, elimination and graphically • Solve linear/quadratic (H) 	<p>Probability Trees Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Complete and use probability trees for dependent and independent events • Draw and use probability trees (H) <p>Venn Diagrams</p> <ul style="list-style-type: none"> • Use Venn diagrams to represent real life situations and abstract sets • Use Venn diagrams to calculate probabilities • Understand and use set notation <p>Properties of Polygons Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Multistep problems • Algebra <p>Histograms and Cumulative Frequency (H) Draw and interpret</p> <ul style="list-style-type: none"> • Histograms • Cumulative frequency graphs • Boxplots 	<p>Real Life Graphs</p> <ul style="list-style-type: none"> • Conversion graphs • Fixed charge and cost per unit graphs • Interpret gradient and intercept <p>Loci and Constructions Review of KS3 content. Extend to include:</p> <ul style="list-style-type: none"> • Standard ruler and compass constructions • Solve loci problems using standard constructions <p>Mocks and Intervention</p> <p>Work Experience</p>

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YEAR 11	<p>Mocks and Intervention</p> <p>Vectors and Geometrical Proof</p> <ul style="list-style-type: none"> Understand and use vectors Solve 2D geometrical vector problems (H) Use vectors to produce geometrical arguments and proof (H) <p>Fractional and Negative Indices</p> <ul style="list-style-type: none"> Non unit fractional powers (H) <p>Functions (H)</p> <ul style="list-style-type: none"> Understand and use function notation Substitute into a function Composite functions Inverse functions Equations involving function notation 	<p>Further Trigonometry</p> <ul style="list-style-type: none"> Exact trig values Sine rule for area (H) Sine and Cosine rules (H) <p>Proof</p> <ul style="list-style-type: none"> know the difference between an equation and an identity argue mathematically to show algebraic expressions are equivalent Use algebra to support and construct proof (H) <p>Graphs and Graph Transformations</p> <ul style="list-style-type: none"> Cubic and reciprocal graphs Exponential and trigonometric graphs (H) Graph transformations (H) 	<p>Area under a graph & gradient of a curve (H)</p> <ul style="list-style-type: none"> Estimate area under a graph Estimate the gradient of a nonlinear graph <p>Algebraic Fractions (H)</p> <ul style="list-style-type: none"> Simplify $\pm/\times/\div$ algebraic fractions Solve equations arising from algebraic fractions <p>Iteration (H)</p> <ul style="list-style-type: none"> Find approximate solutions to equations using iteration <p>Equation of a Circle and Tangents (H)</p> <ul style="list-style-type: none"> Recognise and construct the graph of a circle Find the equation of the tangent to a circle at a given point 	Revision	Revision	Examinations

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
	<p>Proof (AS)</p> <ul style="list-style-type: none"> Deduction Exhaustion Counter Example <p>Surds and Indices (AS)</p> <p>Recap and extend content from GCSE</p> <p>Quadratic Functions (AS)</p> <p>Recap contents from GCSE. Extend to include:</p> <ul style="list-style-type: none"> Finding and interpreting the Discriminant <p>Equations and Inequalities (AS)</p> <p>Recap and extend content from GCSE</p> <p>Coordinate Geometry (AS)</p> <p>Recap straight line and circle geometry from GCSE. Extend to include</p> <ul style="list-style-type: none"> Circles with centre (a,b) <p>Polynomials (AS)</p> <ul style="list-style-type: none"> Factor Theorem Algebraic Division 	<p>Trigonometry (AS)</p> <p>Recap trigonometry from GCSE. Extend to include:</p> <ul style="list-style-type: none"> Trigonometric graphs, symmetries, and periodicity Understand and use $\tan \theta = \frac{\sin \theta}{\cos \theta}$ $\sin^2 \theta + \cos^2 \theta = 1$ Solve simple trigonometric equations <p>Graphs and Graph Transformations (AS)</p> <ul style="list-style-type: none"> Understand and use graphs of functions Understand the effect of simple graph transformations <p>Differentiation (AS)</p> <ul style="list-style-type: none"> Gradient of a curve Differentiation from first principles Differentiation of x^n including expressions with 2 or more terms Gradients, tangents, normals and stationary points Increasing/decreasing functions 2nd order derivatives Modelling <p>Integration (AS)</p> <ul style="list-style-type: none"> Integration of x^n including expressions with 2 or more terms ($n \neq -1$) Evaluate definite integrals 	<p>Integration Continued (AS)</p> <ul style="list-style-type: none"> Find the area under a curve and between the curves and lines <p>Vectors (AS)</p> <ul style="list-style-type: none"> Representing Magnitude and direction Position vectors Geometric problems Modelling <p>Exponentials and Logarithms (AS)</p> <ul style="list-style-type: none"> Exponential functions Exponential modelling Laws of logarithms Equations Natural logarithms <p>Binomial Expansion (AS)</p> <ul style="list-style-type: none"> Pascal's triangle Factorial notation Binomial expansion for positive integer n <p>Kinematics (AS)</p> <ul style="list-style-type: none"> Quantities and units Understand and use the language of kinematics D-T graphs and V-T graphs Understand, derive, and use the SUVAT equations <p>Data Collection (AS)</p> <ul style="list-style-type: none"> Populations and samples Sampling techniques <p>Data Processing, Presentation, and Interpretation (AS)</p> <ul style="list-style-type: none"> Measure of central tendency Measure of spread Variance and standard deviation 	<p>Data Processing, Presentation, and Interpretation Continued (AS)</p> <ul style="list-style-type: none"> Outliers Box plots Cumulative frequency Histograms Comparing data Correlation Linear regression <p>Forces and Newton's Laws of Motion (AS)</p> <ul style="list-style-type: none"> Force diagrams Forces as vectors Forces and acceleration Motion in 2D Connected particles Pulleys <p>Variable Acceleration (AS)</p> <ul style="list-style-type: none"> Functions of time Using differentiation Maxima and minima problems Using integration <p>Probability (AS)</p> <ul style="list-style-type: none"> Calculating probabilities Venn diagrams Mutually exclusive and independent events Tree diagrams <p>The Binomial Distribution (AS)</p> <ul style="list-style-type: none"> Binomial distribution as a model Calculate probabilities using the binomial distribution <p>Statistical Hypothesis Testing (AS)</p> <ul style="list-style-type: none"> Understand and apply the language of statistical hypothesis testing Conduct a statistical hypothesis test 	<p>Sequences and Series (A2)</p> <ul style="list-style-type: none"> Arithmetic sequences and series Geometric sequences and series Sum to infinity Sigma notation Recurrence relations Modelling <p>Functions (A2)</p> <ul style="list-style-type: none"> Modulus function Functions and mappings Composite and inverse functions Transformations Solving modulus problems 	<p>Differentiation (A2)</p> <ul style="list-style-type: none"> Chain rule Product rule Quotient rule 2nd derivatives Points of inflection Rates of Change <p>Further Differentiation (A2)</p> <ul style="list-style-type: none"> Differentiating trigonometric functions, exponentials and logarithms <p>Trigonometry (A2)</p> <ul style="list-style-type: none"> Work with radians including arc length and area of a sector and segments Solving trigonometric equations Understand and use the small angle approximations for sin, cos and tan Exact values <p>Trigonometric Functions (A2)</p> <ul style="list-style-type: none"> Secant, cosecant and cotangent Inverse trigonometric functions

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Year 13	<p>Trigonometric Identities (A2)</p> <ul style="list-style-type: none"> Addition formula Double angle formula Trigonometric identities Solving trigonometric equations Proving trigonometric identities Modelling <p>Algebra (A2)</p> <ul style="list-style-type: none"> Algebraic fractions Partial fractions Repeated factors Algebraic division Binomial expansion with any rational n <p>Parametric Equations (A2)</p> <ul style="list-style-type: none"> Parametric equations Using trigonometric identities Curve sketching Points of intersection Modelling <p>Integration (A2)</p> <ul style="list-style-type: none"> Using trigonometric identities Reverse chain rule By substitution By parts Partial fractions Areas 	<p>Proof (A2)</p> <ul style="list-style-type: none"> Proof by contradicting <p>Differential Equations (A2)</p> <ul style="list-style-type: none"> Solving differential equations Modelling <p>Vectors (A2)</p> <ul style="list-style-type: none"> Vectors in 3D Geometric problems <p>Kinematics (A2)</p> <ul style="list-style-type: none"> Vectors in kinematics Variable acceleration Differentiating and integrating vectors <p>Projectiles (A2)</p> <ul style="list-style-type: none"> Horizontal and vertical components Projection at an angle Projectile motion formulae Vector methods with projectiles <p>Probability (A2)</p> <ul style="list-style-type: none"> Set notation Conditional probability formula Venn diagrams Tree diagrams Modelling <p>Probability Distributions (A2)</p> <ul style="list-style-type: none"> Normal distribution Finding probabilities with the normal distribution 	<p>Probability Distributions Continued (A2)</p> <ul style="list-style-type: none"> Approximating a binomial distribution Selecting appropriate probability distributions <p>Force and Motion (A2)</p> <ul style="list-style-type: none"> Resolving forces Static particles Modelling with statics Rigid bodies Dynamics and inclined planes Connected particles <p>Friction (A2)</p> <ul style="list-style-type: none"> Understand and use $F \leq \mu R$ Resolving forces Inclined planes Limiting friction 	<p>Hypothesis Testing (A2)</p> <ul style="list-style-type: none"> Correlation coefficients Critical values Hypothesis testing with the normal distribution <p>Numerical Methods (A2)</p> <ul style="list-style-type: none"> Locating roots Iteration Newton-Raphson Modelling Trapezium rule <p>Moments (A2)</p> <ul style="list-style-type: none"> Resultant moments Equilibrium Centre of mass Tilting 	Revision	Examinations