Maths

Year 7

Topic	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Algebraic Thinking & Place Value	Applications of Number	Applications of Number	Directed Number & Fractional thinking	Lines & Angles	Reasoning with number
Key Knowledge and skills	• To continue sequences, explain their rules and recognise the different types of sequence. • To understand algebra notation through function machines and be able to substitute numbers into expressions. • To be able to collect like terms and begin to solve one-step equations using inverse operations. • To be able compare numbers, including decimals up to one billion.	• To be able to find the median and range of numbers and begin to explore standard form. • To be able to convert between fractions, decimals and percentages. And begin to use and interpret pie charts. • To be able to use addition and subtraction problems involving with frequency trees, charts and standard form numbers.	• To be able to solve problems with multiplication and division including decimals. • To use multiplication and division to find the mean of a list of numbers and solve problems involving areas. • To understand how to find fractions and percentages of amounts.	• To understand and perform calculations with directed number and link to solving equations. • To be able to add and subtract fractions including mixed numbers and simple algebraic fractions.	• To be able to construct angles, lines, triangles and pie charts using the correct mathematical equipment. • To understand and recognise the types of triangle, quadrilateral and polygons. • To know and apply the sum of angles at a point, line, triangles, quadrilaterals, polygons and angles in parallel lines. • To interpret and create Venn diagrams and begin use probability including scale and vocabulary.	• To be able to identify types of numbers and from this write a number as a product of primes and find the HCF/LCM. • To solve proportional problems including dividing by a given ratio and express ratios in their simplest form.
End Point	To be able to move freely between different numerical, algebraic and graphical diagrammatic representations.	To be able to understand equivalence between types of number. To use numbers fluently in a variety of problems.	To be able to answer questions successfully involving multiplication and division using calculator and mental methods.	To extend our basic number understanding to calculating with fractions and negative numbers.	To be able to use a wide range of mathematical drawing equipment to create shapes To understand key rules of shapes and lines and answer questions involving these.	To be able to calculate with prime numbers. To begin to understand the meaning of ratio and links with scale.

Year 8

Topic	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Proportional Reasoning	Representations & Algebra techniques	Developing Number	Developing Number	Developing Geometry	Reasoning with Data & Graphs
Key Knowledge and skills	• To be able to solve problems involving direct proportion and recognise the links between currency conversion, similar shapes and proportion graphs. • To be able to multiply and divide fractions and understand the reciprocal. • To understand the different types of graphs including coordinates, midpoints, horizontal, vertical lines and positive and negative gradients and lines.	• To understand relationships and correlations between data and begin to read and interpret data. • To be able to construct sample space diagrams, two-way tables and Venn diagrams and to find probabilities from these tables. • To be able to use basic algebra skills such as expanding, factorising and solving for expressions, equations and inequalities.	• To generate sequences from words and algebraic rules and find the nth term for a sequence. • To be able to use the addition and subtraction laws for indices. • To be able to convert fluently between FDP including those greater than 100%. • To be able to calculate percentage increase and decrease, percentage change, reverse percentage and express on number as a fraction or percentage of another.	• To be able to develop our understanding of standard form and be able to calculate with these numbers. • To be able to round numbers within questions to estimate and for the final answer. • To be able to convert between metric units including length, area and volume ad solve problems involving time and the calendar.	• To be able to use the basic angle facts and extend this understanding to further angles in parallel lines and in polygons. • To be able to calculate the area and perimeter of 2d shapes including circles and compound shapes. • To be able to understand line symmetry and reflect shapes in horizontal, vertical and diagonal lines.	• To be able to draw and interpret bar charts, pie charts, line graphs and identify misleading graphs. • To be able to understand types of averages and use the most appropriate average when comparing and analysing data. • To be able to understand and use y=mx+c and interpret gradients and intercepts in real life graphs.
End Point	To be able to explore the links between direct proportion in calculations and with graphs. To extend our knowledge of calculating with fractions.	To be able to interpret scatter graphs and their relationships. To find probabilities from sample space and two-way tables To understand key concepts in algebra such as expanding, factorising and solving with expressions, equations and inequalities.	To be able to generate rules for sequences using words and algebra To be able to simplify algebraic expressions using the laws of indices To continue our understanding of FDP with decreasing fraction and percentage problems, percentage change and reverse percentage problems.	To be able to consolidate writing and calculating with numbers in standard form. To round with numbers and find their error intervals. To convert between measures of length, weight, capacity, area and volume successfully.	To further extend our knowledge angles in parallel lines and polygons To calculate the area of shapes including circles. To be able to understand line symmetry and reflect shapes in horizontal, vertical and diagonal lines.	To be able to draw and interpret many types of charts in order to present data in an informative way. To compare and use distributions of data and understand the most appropriate average to use. To further our understanding of straight-line graphs and interpret gradients and intercepts.

Year 9

Topic	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Reasoning with algebra	Constructing in 2 & 3 Dimensions	Reasoning with Number	Reasoning with Geometry	Reasoning with proportions & representations	Similarity & developing algebra
Key Knowledge and skills	• To be able to form and solve one and two step equations/inequalities. • To be able to rearrange formula including formula with brackets and squares. • To be able to expand a pair and three binomials and test conjectures with number. • To be able to sketch and draw accurately plans and elevations. • To be able to calculate surface areas and volumes of 3d shapes.	• To construct angle and line bisectors and link these to drawing the loci of points given a set of rules. • To explore and identify the rules of congruency. • To calculate with directed number, surds, fractions and solve problems with standard form, fractions and HCF/LCM. • To express a change as a percentage and solve problems with repeated percentage change.	• To understand the maths in money such as simple and compound interest, VAT and exchange rates. • To be able to make conjecture with shape and angles and reason findings using algebra. • To be able to rotate a shape around a given point and translate a shape by a given vector.	• To be able to calculate the length of a side in a right-angled triangle using Pythagoras' Theorem and explore Pythagoras in 3D. • To be able to enlarge a shape by a positive and a negative scale factor • To be able to solve problems involving direct, inverse proportion and ratio.	• To be able to calculate speed, distance, time and density, mass, volume problems. • To calculate probability from single and multiple events using tree diagrams to help. • To draw and interpret quadratic graphs, reciprocal graphs and graphs of simultaneous equations and inequalities. • To explore areas and volumes of similar shapes and understand the difference between similarity and congruence.	• To calculate missing angles and side lengths of right-angled triangles using SOH CAH TOA and use within 3D shapes • To understand and use the sine rules and cosine rules for finding missing angles and side lengths in all triangles. • To solve and show inequalities on a number line and using graphs. • To be able to solve complex equations with an unknown on both sides and solve quadratic equations by factorising.
End Point	To be able to use algebra to form and solve equations linking to all different units within maths. To be able to extend and use our knowledge of 2d to 3d shapes with finding surface area and volumes.	To be able to construct 2d shapes using mathematical equipment. To be able to build upon our knowledge of percentages and apply the working out to questions often in real life contexts.	To apply mathematics to real life money and life skills questions and scenarios. To be able to expand our visual mathematical mind to questions involving rotations and translations.	To appreciate the beauty of geometry topics such as enlargement, similarity and Pythagoras's theorem. To be able to extend our knowledge of ratio and proportion with links to all areas of maths.	To apply mathematical concepts to real life situations through rates e.g. speed, density, compound units and probability e.g. the likelihood of an event happening using different methods and diagrams. To further develop our knowledge of congruence, enlargement and similarity.	To understand the mathematics behind the right-angled triangle and links to other areas of geometry and algebra. To represent solutions of inequalities algebraically, diagrammatically and graphically.

Maths

Year 10

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Geometry	Geometry	Proportions & Proportional change	Delving into data	Using number	Graphs
Key Knowledge and skills	• To be able to solve linear simultaneous equations by substitution and elimination. • To extend our knowledge of simultaneous equations to one being linear and the other quadratic. • To draw and calculate bearings using basic angle rules and using mathematical equipment. • To be able to calculate area and circumference of circles, sectors and arcs. • To be able to identify and use the circle theorems.	• To be able to understand and use the formula for finding the volume and surface areas of spheres, cones and cylinders. • To be able to understand and use vector notation, including addition and subtraction of vectors. • To be able to explore vector journeys in shapes and line with parallel and colinear lines. • To solve problems involving ratio and scale.	• To be able to calculate percentages including percentage change, reverse percentages, growth and decay problems and use the iterative process. • To be able to construct Venn diagrams and sample space diagrams to be able to find probabilities of independent and dependant events.	• To be able to construct frequency trees, frequency polygons, two-way tables, pie charts and bar charts. • To be able to construct and interpret histograms, cumulative frequency diagrams, box-plots and scatter graphs. • To be able to use the four rules of fraction arithmetic, calculate with exact answers, surds and bounds. • To solve problems with financial maths and break down multi-step problems.	• To calculate the HCF/LCM of a pair of numbers and find the nth terms of linear and quadratic sequences. • To understand and work with the laws of indices including fractional and negative indices and calculate with standard form.	• To be able to use the four rules of arithmetic with algebraic fractions and solve equations with algebraic fractions. • To find the equation of a straight line from a graph, a gradient and a point, and 2 points. • To extend this understanding of straight lines to parallel and perpendicular lines. • To be able to plot and read from quadratic, cubic and reciprocal graphs. • To understand and use exponential graphs and the equation of a circle.
End Point	To be able to answer questions involving two unknowns algebraically and graphically. To be able to apply angle rules to real life scale and bearings questions. To extend our knowledge of circles as 2d shapes, to 3d shapes and our circle theorems (higher tier only)	To extend our knowledge of circles as 2d shapes, to 3d shapes and our circle theorems (higher tier only) To be able to represent vectors as column vectors, diagrams and journeys in shapes. To link ratio and fractions and revise all the connected topics around ratio and fractions.	To be able to calculate percentages including interest rates and problems involving growth and decay. To continue the understanding and consolidation of probability including using tree diagrams and Venn diagrams to be able to find probabilities.	To be able to recap types of charts and graphs including scatter graphs and be able to interpret the results from these graphs. To be able to construct histograms, box plots and cumulative frequency charts and use these to compare distributions. To recap the use of number without a calculator including fractions, surds, rounding and limits of accuracy.	To be able to continue arithmetic and geometric sequences and can find the nth terms for linear and quadratic (higher tier) sequences. To be able to calculate with index laws including fractional and negative indices and those within standard form calculations.	To be able to represent numbers algebraically and solve algebra proofs To be able to find equations of straight lines, parallel lines and perpendicular lines. To be able to plot and read from non-linear graphs and be able to identify roots and intercepts where necessary.

Year 11

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Algebra	Reasoning	Reasoning	Bespoke Revision	Bespoke Revision	Bespoke Revision
Key Knowledge and skills	• To construct and interpret distance/time graphs and speed/time graphs. • To be able to approximate solutions to equations using graphs and find the areas under a curve. • To be able to expand binomials and factorise quadratics. • To solve quadratic equations by factorising, using the quadratic formula and by completing the square. • To be able to change the subject of a formula and solve problems by iteration. • To use and understand function notation and work with composite and inverse functions. • To understand and construct direct and inverse proportion equations.	• To be able to reason geometrically bringing together all our understanding of angles and shapes including circle theorems, Pythagoras, trigonometry and vectors. • To be able to reason algebraically bringing together all our understanding of algebra including finding the nth term of sequences, solving equations including simultaneous, inequalities and proof.	• To be able to bring together our understanding of transforming shapes with, rotation, enlargement, translation, reflection, loci, constructions and graphical transformations. • To be able to revise comparing and interpreting data through diagrams and be able to work out probability through organised lists and diagrams. • To be able to answers exam style 'show that' questions on all topics.	• Students will be following a bespoke revision programme based on the needs of their group and the topics they need to revise.	• Students will be following a bespoke revision programme based on the needs of their group and the topics they need to revise.	• Students will be following a bespoke revision programme based on the needs of their group and the topics they need to revise.
End Point	To be able to interpret and construct real life graphs and find areas under curves (higher tier). To be able to expand binomials and factorise quadratic expressions leading to solving quadratic equations using all methods. To change the subject of an equation and work with functions including composite and inverse functions. To recap multiplicative reasoning including scale, proportion and ratio.	To be able to begin revising topics from the geometric and algebraic sections of the schemes of work.	To be able to begin revising topics from the transformation and reasoning schemes of work.	Students to work through a bespoke scheme of work based on the groups needs to prepare them for the GCSE exams.	Students to work through a bespoke scheme of work based on the groups needs to prepare them for the GCSE exams.	Students to work through a bespoke scheme of work based on the groups needs to prepare them for the GCSE exams.