



Mathematics

KS4 MATHS (FOUNDATION)	Content
Year 10 HT 1	<p>Percentages: finding a percentage of an amount (with and without a calculator), increasing and decreasing by a percentage, finding a value as a percentage of another (percentage change), simple interest and compound interest and depreciation.</p> <p>Collecting data and sampling, statistical graphs and charts and averages and spread. Data and sampling include: tally charts, two way tables, frequency tree diagrams, stem and leaf diagrams, sampling, bar, dual and composite bar charts, line graphs, pie charts, scatter graphs, frequency polygons, introduction to cumulative frequency graphs, introduction box-plots, introduction to histograms. Averages include: to calculate the mean, median, mode and range of data, including data from a table and find a new mean.</p>
Year 10 HT 2	<p>'Perimeter, area and volume'. This includes measuring lines, perimeter and area of 2D shapes, surface area of 3D shapes, area & circumference of circles and volume of 3D shapes.</p> <p>'Indices, roots and surds'. This includes learning about square/cube numbers/roots, estimating roots, calculating powers and roots using a calculator, working with negative and fractional indices, powers of 10, rules of indices and surds.</p> <p>'Ratio and proportion'. This includes simplifying ratios, finding equivalent ratios, converting between ratios and fractions, sharing into a ratio, proportion in the recipes context, calculating the best value for money and unit pricing, conversion graphs and proportion graphs, direct and inverse proportion.</p> <p>'Fractions'. This includes simplifying fractions, equivalent fractions, ordering fractions, converting between improper fractions (top heavy) and mixed numbers, calculating fractions of amounts, operations with fractions (and mixed numbers) and converting between fractions, decimals and percentages (including recurring decimals to fractions). We will also be learning how to simplify algebraic fractions and then practise calculations with algebraic fractions.</p>
Year 10 HT 3	<p>'Algebraic manipulation'. This includes contextualising collecting like terms, simplifying algebra by collecting the like terms and by using multiplication, expanding brackets, factorising (including quadratics), simplifying algebraic fractions, completing the square, index laws and proofs (algebraic, geometric and trigonometric).</p> <p>'Solving equations and inequalities'. This includes creating worded equations, finding the unknown (not letters), understanding and using inverse operations, solving equations (including simultaneous equations and quadratics), creating equations (with shapes, angles and real life), representing inequalities on a number line, solving inequalities (including quadratics) and representing inequalities on a graph (regions).</p>
Year 10 HT 4	<p>'Angles and properties of shapes'. This includes 2D and 3D shapes, measuring and drawing angles, calculating angles (in a right angle, on straight line, around a point, in a triangle (including special triangles), in quadrilaterals). We will also be calculating interior and exterior angles in polygons and angles on parallel lines. Additionally, we will be learning about bearings, circle theorems and trigonometry (Pythagoras' theorem, SOHCAHTOA, sine/cosine rule and area of a triangle using sin).</p> <p>'Factors, multiples and primes'. This includes learning and using the prime numbers, listing the factors and multiples of a number, writing a number as a product of prime factors, calculating the HCF (highest common factor) and LCM (lowest common multiple) of a set of numbers (including the use of Venn diagrams).</p> <p>'Construction and loci'. This includes constructing triangles, drawing nets, constructing bisectors, reading and using scales, loci, plans and elevations.</p>
Year 10 HT 5	<p>'Formulae'. This includes substitution (including worded formulas), creating expressions and formulae, rearranging formulae and iteration.</p> <p>'Sequences and algebraic graphs': co-ordinates, midpoints, drawing axis, function machines, naming lines, plotting straight line graphs, recognising and using the gradients and intercepts, plotting and interpreting graphs, functions, equation of a tangent, equation of a circle, calculating and interpreting the area under a graph and completing the square to calculate turning points. The sequences part includes finding missing terms in a sequence, recognising and using special sequences, finding and using the nth term rule of a sequence.</p> <p>'Transformations and vectors'. This includes symmetry, reflection, rotation, translation and enlargement. We will also be learning about column vectors, resultant vector and algebraic vectors. Additionally, we will be looking at more complex vector questions (including vectors proof) and transformations of graphs (including trigonometric graphs).</p>



Mathematics (Higher)

KS4 MATHS (FOUNDATION)	Content
Year 10 HT 6	The first part of the half term, you will finish the 'Transformations' topic, started the previous half term. During this half term, you will also be doing your mock exams. Additionally, we will cover some finance lessons. The final topic is 'Compound measures'. This includes time/journey graphs, rate of pay and unit pricing, compound measures (speed/distance/time, mass/density/volume and pressure/force/area) and other real life graphs (interpreting the gradient as a rate of change, velocity and acceleration, gradient of a curve, area under a graph/curve).
Year 11 HT 1	Higher GCSE: Algebraic manipulation and solving equations and inequalities: converting problems to algebra, simplifying terms, factorising to a single bracket and quadratic equations, using rules of indices, simplifying algebraic fractions, completing the square and algebraic proofs of multiples. Solving equations and inequalities: solving equations with the unknown on one or both sides, solving inequalities, solving equations created from real life situations, solving quadratics by factorising, formula and completing the square and simultaneous equations. Probability: sample space diagrams and combinations, understanding that probabilities add up to 1, estimating using probability, using Venn Diagrams for probability, venn diagrams and set notation, using 2 way tables and frequency trees for probability and drawing and using probability trees. Percentages: develop on the percentages skills they have already learned and apply them to problem solving questions. Students will also learn about growth and decay (interest and depreciation) and reverse percentages.
Year 11 HT 2	Higher GCSE: The first topic is 'Ratio and proportion': sharing into a ratio, proportion in the recipes context, calculating the best value for money and unit pricing, conversion graphs and proportion graphs, direct and inverse proportion (algebraically and graphs). 'Place value, rounding, estimating and bounds': rounding to decimal places and significant figures, using place value for multiplication and division, error intervals, standard form and lower/upper bounds. 'Indices, roots and surds': calculating powers and roots using a calculator, working with negative and fractional indices, rules of indices, surds. This topic can be combined with algebra and shapes and we will be practising surds questions in the context of perimeter, area and volume.
Year 11 HT 3	Higher GCSE: 'Formulae': substitution, creating expressions and formulae, rearranging formulae and iteration. 'Sequences and algebraic graphs': using coordinates (including in 3D), midpoints, plotting straight line graphs, recognising and using the gradients and intercepts, plotting and interpreting graphs, functions, equation of a tangent, equation of a circle, calculating and interpreting the area under a graph and completing the square to calculate turning points. The sequences part includes recognising and using special sequences, finding and using the nth term rule of a sequence. 'Fractions': calculating fractions of amounts, operations with fractions (and mixed numbers) and converting between fractions, decimals and percentages (including recurring decimals to fractions). We will also be learning how to simplify algebraic fractions and then practise calculations with algebraic fractions.
Year 11 HT 4	Higher GCSE: 'Compound measures': time/journey graphs, rate of pay and unit pricing, compound measures and other real life graphs. 'Construction and loci': constructing bisectors, loci, plans and elevations. 'Similarity and congruence': scale drawings and maps, proof of congruency and similar shapes. We will also be working with linear/area/volume scale factors.
Year 11 HT 5	Foundation/Higher GCSE: Bespoke topics for each class: topic gaps & papers