



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>



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Year 10 HT 6	<p>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).</p>
Year 11 HT 1	<p>Foundation GCSE:</p> <p>The topics that will be covered are percentages, factors, multiples and primes, indices, roots and surds, place value, rounding, estimating and bounds. In percentages students will learn to work out percentages of amounts, increase and decrease by percentages and calculate the answer to percentage problem solving questions. They will learn the difference between factors, multiples and primes and calculate the highest common factor and lowest common multiples of numbers. In their final topic of the half term, they will understand place value and the impact it has on calculations and be to use their rounding skills to estimate questions.</p>
Year 11 HT 2	<p>Foundation GCSE:</p> <p>'Ratio and proportion': 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.</p> <p>'Algebraic manipulation': contextualising collecting like terms, simplifying algebra by collecting the like terms and by using multiplication, expanding brackets, factorising (including quadratics) and index laws.</p> <p>'Solving equations and inequalities': creating worded equations, finding the unknown (not letters), understanding and using inverse operations, solving equations (including quadratics and simultaneous equations), creating equations, representing inequalities on a number line and solving inequalities.</p>
Year 11 HT 3	<p>Foundation GCSE:</p> <p>'Probability': language of probability, finding and estimating probabilities (including from sample space diagrams, two way tables, frequency trees, Venn diagrams and tree diagrams).</p> <p>'Perimeter, area and volume': measuring lines, perimeter of 2D shapes (including compound shapes), area of 2D shapes (including compound shapes), surface area of 3D shapes, area and circumference of circles and volume of 3D shapes.</p>
Year 11 HT 4	<p>Foundation GCSE:</p> <p>'Sequences and algebraic graphs': using coordinates, midpoints, drawing axis, function machines, naming lines, plotting straight line graphs, recognising and using the gradients and intercepts (including real life graphs), plotting and interpreting quadratic graphs. The sequences part includes finding missing terms in a sequence, recognising and using special sequences, finding and using the nth term rule of a linear sequence.</p> <p>'Fractions': 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.</p>
Year 11 HT 5	<p>Foundation/Higher GCSE:</p> <p>Bespoke topics for each class: topic gaps & papers</p>