



# KS3 Mathematics

	Content
Year 7 HT 1	<b>Ratio and proportion (with bar modelling):</b> Time, including converting and interpreting decimal proportions of hours and solving problems involving time; fractions, including non-calculator arithmetic and converting between fractions, decimals and percentages; ratio, direct proportion including scaling and judging 'best buys' and percentages.
Year 7 HT 2	<b>Area and perimeter:</b> This unit builds on students' prior understanding of the perimeter of 2D shapes (total length around the edges) and their area (total space inside, measured in squares). The unit includes working with place value, all four operations without a calculator (adding, subtracting, multiplying and dividing) and rounding, all put into context of the shape work. We also review the names and properties of 3D shapes and extend their understanding of area to include surface area of simple 3D shapes (but not volume, which we will come back to later in the year). Finally, we look at the use of rounding to find approximate answers to problems, and using this to check 'actual' answers are the right size.
Year 7 HT 3	<b>Algebra I (algebraic manipulation) including negative numbers and BIDMAS:</b> This unit works with Algebra, the order of operations ('BIDMAS') and positive and negative numbers, using letters to represent numbers and creating algebraic expressions from worded descriptions or familiar contexts, simplifying expressions by collecting like terms and expanding single brackets (multiplying terms in a bracket by a single term in front of it) and factorising (the opposite process).
Year 7 HT 4	<b>Probability and Venn diagrams (sets):</b> In this unit students will develop their understanding of the language of likelihood and probability, use of numeric probabilities to measure chance more precisely, use the probability scale from 0 (impossible) to 1 (certain), use of fractions, decimals and percentages including conversions between them; consider probabilities of two combined events with tables and probability trees and look at Venn diagrams.
Year 7 HT 5	<b>Algebra II (formulae and equations) including volume of 3D shapes:</b> The unit begins with substitution of values into worded formulae, algebraic expressions, including brackets, powers and substitutions with negative numbers and fractions; formulae and area and perimeter, volume of 3D shapes and substituting into volume formulae for cubes, cuboids and right prisms. Also solving single step linear equations, function machines and rearranging single step formulae.
Year 7 HT 6	<b>Angles and Shapes:</b> Within this topic pupils will learn about reflective and rotational symmetry, 2D and 3D shapes and properties, nets, angle facts, angles in triangles and quadrilaterals and tessellation. This topic helps students to identify shapes they may see in day to day life and the properties of them.
Year 8 HT 1	<b>Ratio and proportion:</b> This unit includes simplifying ratio, sharing in a ratio, time proportion, speed/distance/time including graphs, best buys, recipes, conversion graphs and exchange rates and distance-time graphs. Second part includes Fractions: equivalent fractions, fractions of amounts, converting and comparing between decimals-percentages-fractions, calculating percentages of amounts, percentage multipliers and increase/decrease by a percentage, compound interest and percentage change.
Year 8 HT 2	<b>Area and Volume:</b> Includes perimeter of 2D shapes, their area and volume from year 7. Also working with place value, ordering and rounding whole numbers and decimals in the context of shape work and includes surface area of prisms and looking at finding volume of simple and complex prisms. In addition, pupils explore circles and name parts of circle, find area and circumference (perimeter) of a circle. Finally, we look at the Pythagoras' theorem in right angled triangles, finding the hypotenuse and shorter side.
Year 8 HT 3	<b>Algebra III (factorising and solving equations and inequalities) including negative numbers and BIDMAS:</b> This unit includes the order of operations-BIDMAS and calculating with negative numbers, expanding single and double brackets and simplifying two single bracket, factorising simple expressions with HCF being a number, letter or both; and also at factorising simple quadratics. Also solving two-step and three-step equations and equations with variable on both sides and solving single and double-sided inequalities and representing inequalities on a number line.



# KS3 Mathematics

	Content
Year 8 HT 4	<b>Factors, multiples and indices:</b> This units includes factors, multiples and primes, LCM and HCF by listing and using Venn diagrams, prime numbers and factors, multiplying and dividing by 10, 100, 1000; Index laws (multiplication, division, powers, negative, unit fractions); standard form converting to and from for large and small numbers and calculations in standard form. Second part of this units focuses on powers, roots (calculating and estimating)
Year 8 HT 5	<b>Algebra IV:</b> This unit includes substituting positive and negative numbers into worded and one step and two step algebraic formulae, rearranging formulae, sequences (term-to-term rule, continuing sequences), special sequences, calculating and using nth term. Second part of this unit involves coordinates in all four quadrants, coordinate geometry, midpoints, horizontal and vertical lines, plotting straight lines, equation of a straight line $y=mx+c$ , calculating $y=mx+c$ from a graph and 2 points.
Year 8 HT 6	<b>Data Handling and Averages:</b> Students will learn how to collect and represent data, this will include bar charts, pictograms and other representations. They will also learn how to find the mean, median, mode and range of data with some students being able to apply this to frequency tables.
Year 9 HT 1	<b>Ratio and proportion:</b> This unit includes using ratio to find the value of each proportion, using proportion to solve problems -eg. recipes and best buys, conversions through calculation and graphs, speed, distance, time - graphs and calculations, mass, density, volume, interpreting the gradient & y-intercept of a graph in real life, similar shapes and scale (length/area/volume) and congruency (incl proof). Other topics are place value, rounding, estimating and bounds, ordering numbers (including negatives, decimals and fractions, converting between metric measures, rounding to a given number of decimal places, estimating, significant figures for rounding and estimating and converting between ordinary numbers and standard form.
Year 9 HT 2	<b>Fractions:</b> This unit includes equivalent fractions, simplifying fractions and finding simplest form and how to order fractions, improper (top heavy) fractions and mixed numbers and finding a fraction of a quantity. Adding and subtracting fractions with different denominators and mixed numbers and multiplying and dividing fractions including mixed numbers, worded percentages and fractions questions and algebraically converting recurring decimals to fractions.
Year 9 HT 3	<b>Constructions, views and loci:</b> This unit includes reading and using scales, nets of 3D shapes, plans and elevations, construction (ASA, SAS, SSS, bisector of a line and angle), loci and worded loci questions. Also Percentages, including personal finance (savings, loans, mortgages), finding percentages with and without a calculator, increase/decrease by a percentage, calculating profit/loss, mixed fractions/percentage questions, reverse percentages, simple interest, compound interest and depreciation including reverse growth and decay.
Year 9 HT 4	<b>Averages and spread:</b> This unit includes finding mode, median, mean and range of a small set of data, recalculating mean, finding mode, median, mean from a table, finding mode, median, mean from grouped data, finding estimated mean from grouped data, cumulative frequency and finding median, lower quartile (LQ), upper quartile (UQ) and Interquartile range (IQR) and estimating from cumulative frequency, plotting and interpreting box plots. Also angles and properties of shapes, measuring and drawing angles, angle facts (RA, SL, AAP, VO), naming 2D and 3D shapes, their properties and nets, tessellation, angles in triangles, quadrilaterals, rules of angles in parallel lines, interior and exterior angles in polygons, bearings (measuring and calculating), Pythagoras' theorem (including in context), 2-D trigonometry-SOHCAHTOA, trigonometry using exact values, circle keywords and circle theorems, sine and cosine rule and area of a triangle $=\frac{1}{2}ab\sin C$ .
Year 9 HT 5	<b>Scale, similarity and congruence and probability:</b> This unit includes: congruency and similarity, scale drawings and maps (scale factor/ratio), metric/imperial conversions, comparing length/area/volume with ratio, congruency and simple similar triangles, linear/area/volume: use ratio/convert units, proof of congruency and similar shapes, similar triangles, enlarge area/volume. Also statistical graphs and charts, bar charts and vertical line graphs, pictograms, drawing and interpreting pie charts, drawing scatter graphs and line of best fit (including correlation, interpreting and outliers), drawing and interpreting frequency polygons, histograms.
Year 9 HT 6	<b>Compound measures:</b> This unit includes time/journey graphs, rates of pay, speed/distance/time, mass/density/volume, pressure force, real graphs, interpreting gradient and y-intercept Also estimating and calculating probability, experimental probability, frequency trees, two way tables, Venn diagram, Space sample diagram, tree diagram (replacement and non-replacement)