



Year 8 Mathematics Curriculum Overview

Please note that the placements of each unit are approximate.

	Units and Objectives
Autumn	Unit 1 – Factors, Powers and Rounding • calculate the highest common factor and lowest common multiple of two numbers in contextual situations • recall prime numbers between 1 and 100 • find the prime factor decomposition of a number • use prime factor decomposition to find the HCF or LCM of two numbers • use the laws of indices for multiplying and dividing to evaluate numbers expressed as powers • recall that any number raised to the power of zero is 1 • round numbers and measures to an appropriate degree of accuracy including decimal places and significant figures • use approximation through rounding to estimate answers • use inequality notation to specify simple error intervals due to truncation or rounding Unit 2 – Simplifying and Solving • distinguish between equations, identities, expressions and formulae • apply the index laws for multiplication and division of integer powers for algebraic expressions • simplify expressions by collecting like terms • expand single brackets including expressions involving indices • factorise linear expressions including expressions involving indices • substitute positive and negative integers into expressions and formulae including those involving indices • rearrange simple linear equations • solve linear equations involving brackets and fractions • solve linear equations where the variable appears on both sides • form and solve linear equations from worded problems • solve linear inequalities showing the solution set in set notation and on a number line Unit 3 – Ratio, Proportion and Real-life Graphs • write ratios in form 1: n or n: 1 and to describe a situation • divide a given quantity into two or more parts using part:part or part:whole-ratios • understand what it means for two quantities to be directly proportional

	• recognise graphs of direct proportion • plot graphs of quantities in direct proportion and read off values to solve problems • interpret real-life graphs from a variety of different scenarios including those that are curved • draw and interpret distance-time graphs Unit 4 – 2D Shapes and 3D Solids • recall and use the formulae for the area of a triangle, parallelogram and trapezium • find and use the volume of a cuboid to solve problems such as finding missing lengths • find and use the surface area of a cuboid to solve problems such as finding missing lengths or volumes • calculate the volume of a prism • calculate the surface area of a prism including L-shaped prisms • name and draw parts of a circle • recall and use the formula for the circumference of a circle • find the radius or diameter of a circle given its circumference • calculate perimeters of composite shapes made circles • recall and use the formula for the area of a circle • find the radius or diameter of a circle given its area • calculate areas of composite shapes made from circles • give answers in terms of π • use $\pi \approx 3.14$ or use the π button on a calculator • calculate the volume of a cylinder • calculate the surface area of a cylinder • understand, recall and use Pythagoras' Theorem in 2D • given three sides of a triangle, justify if it is right-angled or not • calculate the length of the hypotenuse in a right-angled triangle • find the length of a shorter side in a right-angled triangle • calculate the length of a line segment AB given pairs of points • give an answer to the use of Pythagoras' Theorem in surd form
Spring	Unit 5 – Expanding Double Brackets • expand the product of two linear expressions, i.e. double brackets working up to negatives in both brackets and similar to $(2x + 3y)(3x - y)$ • know that squaring a linear expression is the same as expanding double brackets Unit 6 – Fractions, Decimals and Percentages • recognise which denominators of simple fractions produce recurring decimals

- recognise fractional equivalents to important recurring decimals
- convert a recurring decimal into a fraction
- find a percentage of a quantity using a multiplier
- use a multiplier to increase or decrease by a percentage
- work out percentage change including the value of profit or loss
- find the original amount given the final amount after a percentage increase or decrease (reverse percentages) including VAT
- understand the difference between simple and compound interest
- use multipliers for compound growth and decay

Unit 7 – Standard Form

- convert large and small numbers into standard form and vice versa
- interpret a calculator display using standard form and know how to enter numbers in standard form
- add, subtract, multiply and divide numbers in standard form
- adjust numbers into standard form

Unit 8 – Sequences

- continue a Fibonacci-type sequence given the first few terms
- find missing terms within a Fibonacci-type sequence
- continue a linear sequence given the first few terms
- find the n th term of a linear sequence
- use the n th term of a linear sequence to generate terms
- continue a quadratic sequence given the first few terms
- find the n th term of a quadratic sequence in the form $an^2 + b$
- use the n th term of a quadratic sequence to generate terms
- continue a geometric sequence given the first few terms
- using the constant multiplier, find the n th term of a geometric sequence
- use the n th term of a geometric sequence to generate terms

Unit 9 – Statistical Diagrams

- calculate the mean, median, mode and range from a list of data
- decide which is the best average for a set of data
- make comparisons between two sets of data by comparing an average and the range
- find some information about a data set given the mean (reverse means)
- estimate the mean from a grouped frequency table
- find the modal class and class containing the median from a grouped frequency table
- construct and interpret stem-and-leaf diagrams (including back-to-back diagrams)

	• construct and interpret pie charts • construct and interpret cumulative frequency graphs • construct and interpret box plots • understand how bias can impact outcomes • design and critique questionnaires
Summer	Unit 10 – Linear Simultaneous Equations and Inequalities • form and solve linear equations from worded problems involving area and perimeter • solve simultaneous equations where neither equation requires scaling • solve simultaneous equations where one or both equations require scaling • form an inequality from a number line • show an inequality on a number line • solve linear inequalities showing the solution set on a number line • solve two linear inequalities in x, find the solution sets and compare them to see which value of x satisfies both Unit 11 – Probability • list combinations • calculate the relative frequency of a value • use relative frequency to estimate the probability of an event • show outcomes in a sample space diagram • calculate probabilities using a sample space diagram • use correct probability notation, $P(X)$ • identify mutually exclusive outcomes and events • find the probabilities of mutually exclusive outcomes and events using the OR rule: $P(A \text{ or } B) = P(A) + P(B)$ • find the probability of an event not happening • identify independent and conditional outcomes and events • find the probabilities of independent outcomes and events using the AND rule: $P(A \text{ and } B) = P(A) \times P(B)$ • find probabilities from a two-way table • understand how to show events on a Venn diagram • use Venn diagrams to solve probability problems • draw a tree diagram for independent events • use tree diagrams to find the probabilities of two or more independent events Unit 12 – Straight Line Graphs • plot straight-line graphs using a table of values • identify the y-intercept of a straight-line by using its graph

- determine the gradient of a straight-line graph using a 'one across' method
- draw a line with a given gradient
- find the gradient between two points
- understand the relationship between the equation of a straight-line graph ($y = mx + c$), its gradient and y -intercept
- identify the gradient and y -intercept of a straight-line graph given its equation
- determine the equation of a straight-line graph given its gradient and y -intercept
- plot straight-line graphs using the gradient and y -intercept from its equation
- determine the equation of a straight-line by calculating its gradient and y -intercept from a graph
- determine the equation of a straight-line graph given a point and its y -intercept
- determine the equation of a straight-line graph given a point and its gradient
- determine the equation of a straight-line graph given two points

Unit 13 – Similarity and Congruence

- identify congruent shapes
- use SSS, SAS, ASA and RHS to identify congruent triangles
- identify similar shapes
- calculate missing lengths in similar shapes
- identify similar triangles to solve geometrical problems relating to missing lengths and angles