



Year 9 Scheme of Work

Parent Overview 2026-2027

This parent-friendly Scheme of Work provides an overview of the mathematics taught across Year 9. For each unit, it shows the building blocks students draw upon, the key learning objectives and the mathematical vocabulary they will meet.

Half Term	Curriculum Overview
Autumn 1	Unit 1: Frequency Trees and Two-Way Tables; Unit 2: Column Vectors; Unit 3: Angles in Polygons; Synoptic Assessment 1; Unit 4: Prime Factors; Unit 5: Powers and Roots
Autumn 2	Unit 6: Reverse Percentages; Unit 7: Surface Area; Unit 8: Solving Equations 1; Unit 9: Formulae
Spring 1	Unit 10: Compound Units; Unit 11: Standard Form; Unit 12: Linear Graphs
Spring 2	Unit 13: Constructions and Loci; Unit 14: Solving Equations 2; Synoptic Assessment 2; Unit 15: Pythagoras' Theorem
Summer 1	Unit 16: Non-Linear Graphs; Summer Assessment; Unit 17: Arcs and Sectors; Unit 18: Venn Diagrams; Unit 19: Tree Diagrams
Summer 2	Unit 20: Cumulative Frequency and Box Plots; Unit 21: Congruence, Similarity and Trigonometry

What the sections mean

Building blocks: knowledge and skills used as a starting point for the unit. | Key objectives: the main mathematics students will learn. | Key words: important mathematical vocabulary used during the unit.

Unit 1: Frequency Trees and Two-Way Tables

Building blocks

- Writing probabilities as a fraction

Key objectives

- Use information provided to represent data on a frequency tree
- Use a frequency tree to find missing frequencies
- Use a frequency tree to calculate the probability of a given outcome
- Use information provided to represent data in a two-way table
- Use a two-way table to find missing frequencies
- Use a two-way table to calculate the probability of a given outcome

Key words

Frequency, Frequency Tree, Outcome, equally likely outcomes, Event, independent event, dependent event, Probability, Two way table

Unit 2: Column Vectors

Building blocks

- Read and write coordinates
- Describe a translation using a vector
- Understand that a vector has direction and magnitude

Key objectives

- Understand and use column notation in relation to vectors;
- Be able to represent information graphically given column vectors;
- Identify two column vectors which are parallel;
- Calculate using column vectors, and represent graphically, the sum of two vectors, the difference of two vectors and a scalar multiple of a vector.

Key words

Vector, Scalar, Parallel, Column, Graphically, Difference, Sum

Unit 3: Angles in Polygons

Building blocks

- Naming polygons
- Angle in a triangle and quadrilateral
- Use a protractor accurately

Key objectives

- Calculate the interior angle sum of a polygon
- Recall and use the fact that the exterior angle sum of any polygon is 360°
- Solve missing angle problems in regular and irregular polygons

Key words

Interior, Exterior, Polygon, Angle, Regular, Irregular, Degrees

Unit 4: Prime Factors

Building blocks

- Understand that a factor divides into a number equally
- Know and recall prime numbers
- Decompose a number into its prime factors

Key objectives

- Use prime factorisation and a Venn diagram to find the HCF and LCM of a pair of integers
- Use prime factors to solve problems
- Identify and solve worded problems which require the use of HCF and LCM

Key words

Factor, Multiple, Prime number, Prime factor, Highest Common Factor, Lowest Common Multiple

Unit 5: Powers and Roots

Building blocks

- Square and cube numbers
- Index laws
- Converting numbers >1 into standard form Square roots

Key objectives

- Indices
- Recall and use index laws for multiplication, division, powers of powers and power of 0
- Evaluate expressions involving indices where the base is a negative integer, a decimal or a fraction
- Understand the meaning of reciprocal
- 1
- Understand that n^{-1} is equivalent to $\frac{1}{n}$ and extend to n^{-a}
- n
- Use index laws to simplify algebraic expression by multiplication and division, including negative indices
- Surds
- Estimate the value of square roots by considering values it must lie between
- Understand and use surd notation
- Simplify surd expressions by using square numbers

Key words

Base, Index, Power, Surd, Factor, Square number, Estimate, Square root, Reciprocal

Unit 6: Reverse Percentages

Building blocks

- Find a given percentage of an amount using both non-calculator and calculator methods
- Increase or decrease an amount by a given percentage using both noncalculator and calculator methods Calculate percentage change;
- Calculate percentage profit or loss;

Key objectives

- Find the original amount given the final amount after a percentage increase or decrease;
- Use calculator and non-calculator methods to solve reverse percentage problems;

Key words

Percentage, Original Reverse

Unit 7: Surface Area

Building blocks

- Area of rectangle, triangle, parallelogram trapezium and circle Nets
- Find the radius or diameter given the area of a circle

Key objectives

- Find the surface area of a cube and a cuboid;
- Find the surface area of a triangular prism;
- Find the surface area of a cylinder;
- Work backwards from surface area to find (e.g.) the radius or a circle or the side length or a cube;

Key words

Radius, Diameter, Area, Face, Surface Area, Prism, Circle, Pi

Unit 8: Solving Equations 1

Building blocks

- Solving linear equations
- Factorising linear expressions
- Listing factors
- Expand double brackets

Key objectives

- Solve equations of the form $x^2 = a$, including where a is not a square number;
- Solve quadratics of the form $x^2 + bx = 0$ by factorising
- Factorise quadratic expressions of the form $x^2 + bx + c$
- Factorise an expression of form $x^2 - y^2$ and recognise as difference of two squares
- Solve quadratics of the form $x^2 + bx + c = 0$ by factorising
- Use solutions found by factorising to sketch a quadratic graph;

Key words

Solve, Equation, Square, Factor, Factorise

Unit 9: Formulae

Building blocks

- Substitute positive and negative numbers into a formula
- Order of operations
- Functions machines

Key objectives

- Substitution
- Use and substitute into kinematics formulae including when the required value is not the subject
- Use worded formulae e.g. cooking instructions, shoe size conversion working forwards and backwards
- Change the subject
- Change the subject of formulae where x is on one side of the expression
- Change the subject of formulae where two or more steps are required

Key words

Product, Variable, Term, Coefficient, Substitute, Formula, Formulae, Subject, Change the subject

Unit 10: Compound Units

Building blocks

- Express the division of a quantity as a ratio
- Write ratio in its simplest form
- Equivalent ratio
- Understand the concept of best value/best buy
- Solve problems involving speed, distance and time

Key objectives

- Solve problems involving compound units of speed and density;
- Convert between units of speed;
- Convert between currencies, including the use of a conversion graph; Solve best buy problems using a unitary method or by choosing a suitable comparable quantity;
- Solve problems involving rates of pay;

Key words

Speed, Density, Compound, Distance, Time, Mass, Volume, Currency, Convert, Exchange rate, Conversion graph, Best Buy, Unitary method

Unit 11: Standard Form

Building blocks

- Multiplying and dividing by powers of 10
- Converting numbers >1 into standard form
- Index laws

Key objectives

- Convert between standard form and ordinary numbers, including numbers between 0 and 1;
- Order and compare numbers in standard form;
- Add and subtract numbers in standard form, including cases where answers must then be written into correct standard form;
- Multiply and divide numbers in standard form, including cases where answers must then be written into correct standard form
- Use standard form in contextual questions, for example area and perimeter, or real life application such as space

Key words

Standard form, Ordinary form, Base, Index, Factor

Unit 12: Linear Graphs

Building blocks

- Complete a table of values using patterns (link to sequences) and substitution;
- Appreciate the link between a table of values and linear sequences; Plot graphs of functions of the form $y = mx \pm c$ using a table of values
- Plot graphs of quadratic functions of the form $y = x^2 \pm c$
- Find the gradient of a straight line;
- Spot patterns linked to m and c ($y=mx+c$ not explicitly taught here)

Key objectives

- Understand and use the general equation of a straight line $y=mx+c$;
- Plot a linear graph from an equation in the form $y=mx+c$;
- Find the equation of a straight line from a graph in the form $y=mx+c$; Find the equation of straight lines with positive, negative and fractional gradients;
- Identify and interpret gradient from an equation $y = mx + c$;
- Understand that parallel lines have the same gradient;
- Use knowledge of parallel lines to generate the equation of a line that is parallel to a given line, including when given the y -intercept, but not a point, or to select from a list (rearranging into the form $y=mx+c$ is not required until Y10);
- Understand that a straight line intersects the axis when $x=0$ or $y=0$ and use this along with $y=mx+c$ to sketch a straight line graph;
- Find approximate solutions to a linear equation from a graph, including in contexts, and to estimate the value of y given a value for x ;
- Find approximate solutions to linear simultaneous equations using graphs

Key words

Sequence, Term Linear, Gradient, y -intercept, x -intercept, root, Plot Parallel Sketch

Unit 13: Bisectors and Loci

Building blocks

- Construct triangles given information about sides or angles using straight edge, pair of compasses and/or a protractor
- Using a pair of compasses
- Measuring accurately with a ruler

Key objectives

- Use straight edge and a pair of compasses for standard constructions:
- perpendicular bisector of a given line
- perpendicular from a point to a line
- perpendicular from a given point on a line
- bisector of a given angle
- Angles of 30° , 45° , 60° and 90°
- Understand how standard constructions can represent the locus of points
- equidistant from one point, two points or two line segments Draw and construct diagrams from given instructions, including:
- A region bounded by a circle and an intersecting line
- A given distance from a point or a line
- Points that are equidistant from two points or two line segments

Key words

Perpendicular, Bisect, Construct, Locus / Loci, Intersect / Intersections, Equidistant, Region, Compasses, Arc

Unit 14: Solving Equations 2

Building blocks

- Solve linear equations with integer coefficients in which the unknown appears on either or both sides of the equation
- Solve linear equations which contain brackets, including those with negative signs appearing anywhere in the equation or with negative solutions

Key objectives

- Solve linear equations of all types with fractional coefficients
- ax
- Solve equations of the form $+c=d$
- b $ax+b$
- Solve equations of the form $\quad =d$
- c

Key words

Equation Variable, Manipulate, Solve, Numerator, Denominator

Unit 15: Pythagoras' Theorem

Building blocks

- Square numbers
- Properties of triangles
- Solve equations of the form $x^2=a$
- Substitution

Key objectives

- Use and recall Pythagoras' Theorem in 2D to calculate the length of any side in a right-angled triangle, including leaving answers in surd form Use Pythagoras' Theorem to justify whether a triangle is right angled
- Apply Pythagoras' theorem to calculate the length of a line segment

Key words

Hypotenuse, Right angle, Pythagoras' theorem, Square root

Unit 16: Non-Linear Graphs

Building blocks

- Distinguish between a linear and quadratic graph
- Plot graphs of quadratic functions of the form $y = x^2 \pm c$
- Sketch a simple quadratic graph
- Substitute into a quadratic expression, including negatives
- Understand the term reciprocal and how to find the reciprocal of a given number

Key objectives

- Generate points and plot graphs of quadratic functions
- Generate points and plot graphs of cubic functions
- Generate points and plot graphs of exponential functions
- Generate points and plot graphs of reciprocal functions
- Find approximate solutions to quadratic equations using a graph

Key words

Substitute, Plot, Sketch, Quadratic, Cubic, Exponential, Reciprocal, Solution, Roots, Axes / Axis

Unit 17: Arcs and Sectors

Building blocks

- Perimeter of simple shapes
- Circumference and area of a circle

Key objectives

- Find the radius or diameter given the circumference of a circle
- Find the arc length and perimeter of sectors of any angle, giving answers numerically and in terms of π
- Find the area of sectors of any angle, giving answers numerically and in terms of π
- Calculate the area and perimeter of composite shapes involving circles and sectors

Key words

Arc, Sector, Circle, Radius, Diameter, Angle, Area, Perimeter, Composite, Pi, Exact value

Unit 18: Venn Diagrams

Building blocks

- Construct theoretical possibility spaces for combined experiments with equally likely outcomes and use these to calculate theoretical probabilities record describe and analyse the frequency of outcomes of probability experiments using tables and frequency trees
- Relate relative expected frequencies to theoretical probability, using appropriate language and the 0 - 1 probability scale
- Apply ideas of randomness, fairness and equally likely events to calculate
- expected outcomes of multiple future experiments

Key objectives

- Complete Venn diagrams to enumerate two or three sets of data
- Use a Venn diagram to calculate the probability of a given outcome Understand which regions represent “and,” “or,” and “not” on a Venn diagram
- Use Venn diagrams where data is grouped rather than enumerated
- Use of set notation for union, intersection and complement

Key words

Probability, Venn diagram, Union, Intersection, Set, Universal set, Complement, Region, And, Or, Not

Unit 19: Tree Diagrams

Building blocks

Understand and use the probability scale

Find the probability of an event happening using theoretical probability Identify different mutually exclusive outcomes and know that the sum of the probabilities of all outcomes is 1;

Using $1 - p$ as the probability of an event not occurring where p is the probability of the event occurring

Add and multiply fractions and decimals

Key objectives

- Use tree diagrams to calculate the probability of two independent events;
- Use tree diagrams to calculate the probability of two dependent events; Know the difference between exactly and at least when applied to probability;

Key words

Probability, Tree diagram, Event, And, Or, At least, Exactly

Unit 20: Cumulative Frequency and Box Plots

Building blocks

Understand and use frequency tables

Plot points on a graph

Understand the meaning of the median

Key objectives

- Find median, mean, mode range and quartiles from a list;
- Find a missing value given the mean of a set of data;
- Combine two means to find the overall mean of two sets of data;
- Construct cumulative frequency tables;
- Construct a cumulative frequency graph from a table;
- Use a cumulative frequency curve to construct a cumulative frequency table;
- Use a cumulative frequency curve to find the median, quartiles and interquartile range;
- Construct a box plot from summary data;
- Construct a box plot from a cumulative frequency curve and understand the link between the two data representations;
- Interpret box plots to find median, quartiles and interquartile range; Use a cumulative frequency curve and/or box plot to compare the median and spread of two distributions;

Key words

Box plot, box-and-whisker diagram, Central tendency Mean, median, mode, Spread, dispersion, consistency, Range, Interquartile range, Skewness, Discrete, Continuous, Grouped data, Axis, axes, Population, Sample, Cumulative frequency

Unit 21: Congruence, Similarity and Trigonometry

Building blocks

Understand the term congruent and visually identify congruent shapes Understand that congruent shapes result from reflection, translation and rotation

Understand that similar shapes are enlargements of each other and that the dimensions remain in the same proportion within the shape and that angle size is preserved

Identify a scale factor of enlargement

Key objectives

- Understand and use the criteria by which triangles are congruent Understand the term similar shapes and identify shapes that are similar, including all circles or all regular polygons with a given number of sides Understand that three equal angles is enough to determine similar triangles
- Identify the scale factor of enlargement as the ratio of two corresponding sides and use this to find missing sides (“bow tie” and triangles within triangles are not required)
- Understand the link between similar triangles and the trigonometric ratios Use and recall the trigonometric ratios (sine, cosine and tan) and apply them to find angles and lengths in right-angled triangles
- Use trigonometry to solve simple 2D problems, including angles of elevation and depression

Key words

Hypotenuse, Cosine (cos), Sine (sin), Tangent (tan), Right angle, Adjacent, Hypotenuse, Congruent, Similar, Regular, Polygon, Trigonometry, Dimensions, Proportion, Translation, rotation, reflection, enlargement, Ratio, Angle of elevation, Angle of depression