

Subject	Curriculum Intent
Maths	<p>'Mathematics is one of the essential emanations of the human spirit, a thing to be valued in and for itself, like art or poetry' <i>Oswald Veblen 1924</i></p> <p>Our aim is for students to learn how to develop rich connections across mathematical ideas in order to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. A high-quality mathematics education provides the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. Mathematics is critical to employment in science, technology and engineering, and financial literacy. It also plays an important part in most other forms of employment. It is therefore crucial that we develop students' understanding that the subject of mathematics will play a major part in their future lives.</p>

Year 7	By the end of Year 7 students should:
Knowledge	<p><u>Number, ratio and proportion</u></p> <ul style="list-style-type: none"> • Use place value and understand that a digit's value depends on its position in the number. • Use real life examples to introduce negative numbers. • Order and compare numbers including negatives and decimals. • Add and subtract positive and negative integers, and decimals. • Round numbers to decimal places and significant figures • Estimate answers to calculations by rounding to 1 significant figure. • Multiply two and three digit numbers, decimals and negatives. • Divide large numbers by one and two digit numbers, decimals and negatives. • Find factors, multiples, HCF and LCM. • Understand what is meant by a prime number and identify up to 100. • Multiply and divide integers and decimals by 10, 100 and 1000 and understand the effects. • Understand that adding and subtracting are inverse operations and the same with multiplying and dividing.

- Understand equivalent fractions and be able to simplify.
- Compare and order fractions.
- Convert between improper fractions and mixed numbers.
- Add and subtract fractions and mixed numbers.
- Find a fraction of an amount
- Find an amount given a fraction and the amount.

Algebra

- Plot coordinates in all four quadrants and understand and use terminology related to graphs.
- Understand and apply BIDMAS to all calculations.
- Substitute positive and negative values into simple algebraic expressions.
- Substitute values into more complex expressions.
- Understand algebraic convention and index notation.
- Simplify algebraic expressions.
- Solve simple algebraic problems using function machines.
- Find and describe how to find the next term in a sequence.

Shape and Measures

- Calculate the perimeter of squares, rectangles and more complex 2D shapes.
- To transform 2D shapes by translating and enlarging.
- Calculate the area of squares, rectangles, triangles and parallelograms.
- Measure and draw lines of specified lengths.
- Draw, measure and name angles, including becoming proficient at using a protractor.
- Find unknown angles by using rules for angles around a point, on a straight line and vertically opposite angles.
- Properties of triangles and quadrilaterals.
- Read scales and interpret scale drawings.

	<p><u>Data Handling</u></p> <ul style="list-style-type: none"> • Calculate the mean of discrete data.
Skills	<ul style="list-style-type: none"> ➤ Solve worded problem solving questions that involve the topics above. ➤ Solve problems involving money calculations. ➤ Solve word problems involving algebra.

Year 8	By the end of Year 8 students should:
Knowledge	<p><u>Number</u></p> <ul style="list-style-type: none"> • Understand that percentage means out of 100. • Convert between fractions, decimals and percentages, with and without a calculator. • Find any simple percentage of an amount, with and without the use of a calculator. • Find the whole by given the part and a percentage. • Express a number as a percentage of another. • Calculate the percentage of an amount with and without the use of a calculator. • Calculate percentage increase and decrease with and without a calculator and using multipliers. • Calculate the reverse percentage with the use of multipliers. • Understand and use the index laws associated with multiplying, dividing and brackets. • Write a number as the product of its prime factors. • Find the HCF and LCM of two numbers by using a Venn diagram. • Know the square and cube numbers and be able to find square and cube roots. • Multiply and divide fractions and mixed numbers. • Apply all four operations with integers and decimals.

Ratio and Proportion

- Change recipe quantities using proportion.
- Understand that a pie chart represents proportion.
- Know how to express a ratio as a fraction.
- Simplify a ratio into its simplest form.
- Divide amounts into a given ratio.

Algebra

- Apply BIDMAS to more complicated calculations.
- Expand single brackets and double brackets.
- Factorise expressions using common factors.
- Solve one-step and two-step equations.
- Solve equations with unknowns on both sides.
- Solve equations with brackets.
- Present inequalities on a number line.
- Solve inequalities algebraically.

Shape and Measures

- Construct accurately SAS, ASA and SSS triangles and quadrilaterals.
- Find missing angles on parallel lines, using alternate, corresponding and co-interior angle rules.
- Convert between length and area units.
- Find the area of compound shapes made up of triangles and quadrilaterals.
- Find the area of a trapezium using the formula.
- Find the area of a circle, semi-circle and quarter of a circle.
- Be able to read and write analogue and digital time.
- Be able to convert between units of time.
- Convert between volume units.
- Visualise and identify 3D shapes and their nets.

	<ul style="list-style-type: none"> • Use isometric paper to draw accurately 3D shapes. • Draw the plan view, front elevation and side elevation of a 3D shape. • Identify and understand the relationship between the radius and diameter of a circle. • Calculate the circumference of a circle. • Know and use the formula for finding the volume of prisms, cylinders, cones and spheres. • Understand and identify the rotational symmetry of a 2D shape. • Transform a 2D shape by using rotation. <p><u>Data Handling</u></p> <ul style="list-style-type: none"> • Read and interpret pie charts. • Be able to place prime factors of two numbers into a Venn diagram.
Skills	<ul style="list-style-type: none"> • Solve worded problems involving ratio and proportion. • Understand that a calculator uses BIDMAS and use a calculator to solve complex problems. • Use expressions, equations and inequalities to represent worded problems and solve them.

Year 9	By the end of Year 9 students should:
Knowledge	<p><u>Ratio and Proportion</u></p> <ul style="list-style-type: none"> • Understand what direct and inverse proportion are. • Read and sketch graphs of direct and inverse proportional values. • Solve problems involving direct and inverse proportion algebraically. • Read and sketch conversion graphs. <p><u>Algebra</u></p> <ul style="list-style-type: none"> • Complete a table of values for a given function.

- Plot a linear graph using a table of values.
- Understand what gradient and y-intercept are.
- Understand and identify the lines with equations $x=a$ and $y=b$.
- Draw and interpret real-life graphs.
- Understand and use the equation $y=mx+c$.
- Find the equation of a line using the gradient and y-intercept and when given two points on the line.
- Use a graph to find x and y values when given the reverse.
- Understand that the solutions of a function equal to zero lay on the x-axis.
- Find the nth term of a linear sequence and use it to generate terms of a sequence.
- Prove if a number is a term in a sequence.
- Produce and identify non-linear sequences.
- Change the subject of a formula.
- Factorise quadratics and solve quadratics by factorising.
- Simplify algebraic fractions.
- Multiply and simplify algebraic fractions.
- Solve simultaneous equations graphically, by elimination and by substitution.

Shape

- Understand reflectional symmetry.
- Reflect a 2D shape in a given mirror line (vertical, horizontal and diagonal)
- Describe fully a reflection.
- Construct a perpendicular bisector and an angle bisector.
- Construct a perpendicular line from a given point.
- Understand what locus means and answer worded problems involving loci.
- Know that angles in a triangle add up to 180° and in a quadrilateral they add up to 360° .
- Know the names of polygons.
- Understand and use the formula for the sum of the interior angles in a polygon.
- Know that the sum of the exterior angles of any polygon add up to 360° .
- Understand the difference between congruency and similarity.
- Prove that 2 shapes are similar.
- Understand and use the conversions between length, area and volume scale factors.

- Use Pythagoras' theorem to find the hypotenuse and one of the shorter sides of a right-angled triangle.
- Calculate the surface area of solids, including cylinders, pyramids, cones and spheres.
- Calculate missing sides of a right-angled triangle using trigonometry.
- Know the trigonometrical numbers for 0° , 30° , 45° , 60° , 90° .

Data Handling

- Know and identify the types of data.
- Know and identify the terms related to collecting data such as, census and primary and secondary data.
- Understand questionnaires, be able to produce them and identify possible mistakes.
- Be able to record and organise data in a suitable table.
- Read, construct and interpret pictograms, line graphs, bar charts and pie charts.
- Read, construct and interpret scatter graphs including a line of best fit and describing correlation.
- Calculate the median, mode and range of discrete data.
- Estimate the mean and find the mode of a grouped data set.
- Produce and interpret an ordered stem and leaf diagram.
- Use a stem and leaf diagram to calculate, the mean, median, mode and range.
- Understand and use correctly the probability vocabulary.
- Know that probability can take values between 0 and 1.
- Express a probability as a fraction, decimal and percentage.
- Know that probability adds to 1 and use this to find the probability of mutually exclusive events.
- Use Venn diagrams to represent different events.
- Draw and read sample space diagrams and use and use them to answer probability questions.

Skills

- Solve problems involving angles and polygons.
- Solve worded problems that require the use of Pythagoras' theorem and/or trigonometry.
- Be able to compare two data sets using statistical techniques.