

**Mathematics Year 8 Curriculum:** We aim to educate our students so that they have the skills, mathematical knowledge and confidence to take their place in our ever changing, technologically driven world. We want them to enjoy their mathematical education and we try to instil in them a love of the subject and an appreciation of how important it is in day to day life. Every lesson incorporates an element of stretch and challenge at every level and we encourage our students to aim high. Ultimately we want our students to leave us with the excellent qualifications that will allow them to fulfil their dreams, whatever they may be.

There are 5 main areas of Mathematics that will be covered in Year 8: **Number:** – fractions, decimals, percentages, powers, HCF and LCM; **Handling Data:** - probability **Algebra:** -solving equations, direct and inverse proportion, real life graphs, linear graphs, parallel and perpendicular lines; **Shape and space:**-angles, polygons, bearings, scale drawings, construction, loci, congruence, similarity, area, volume, transformations and **Problem solving/using and applying Mathematics.**

Autumn Term:

1. Factors and powers
2. Working with powers
3. 2D shapes and 3D solids
4. Real life graphs

Key Objectives Autumn Term - To be able to:

- Use prime factor decomposition to find the HCF or LCM of two numbers. Work out the laws of indices for positive powers. Use and understand powers of 10. Calculate with powers. Round to a number of significant figures.
- Simplify expressions involving powers and brackets. Understand the meaning of an identity. Use the index laws in algebraic calculations and expressions. Simplify expressions with powers. Write and simplify expressions involving brackets and powers. Factorise an algebraic expression. Substitute integers into expressions. Construct and solve equations.
- Use 2D representations of 3D solids. Sketch nets of 3D solids. Calculate the surface area of prisms. Calculate the volume of right prisms. Name the different parts of a circle. Calculate the circumference and area of a circle. Calculate the radius or diameter when you know the circumference or area of a circle. Calculate the volume and surface area of a cylinder. Use Pythagoras' theorem in right-angled triangles.
- Recognise when values are in direct proportion. Plot graphs and read values to solve problems. Interpret graphs from different sources. Understand financial graphs. Draw and interpret distance–time graphs. Interpret real life graphs and graphs that are curved. Understand when graphs are misleading.

Spring Term:

1. Transformations
2. Fractions, decimals and percentages
3. Constructions and Loci

Key Objectives Spring Term - To be able to:

- Describe and carry out translations, reflections, rotations and enlargements. Enlarge a shape using negative and fractional scale factors. Transform 2D shapes using a combination of reflection, rotation, enlargement and translation. Identify planes of reflection symmetry in 3D solids. Find the perimeter and area of 2D shapes after enlargement. Find the volume of 3D solids after enlargements.
- Recognise fractional equivalents to important recurring decimals. Recognise which denominators of simple fractions produce recurring decimals. Change a recurring decimal into a fraction. Calculate percentages. Work out an original quantity before a percentage increase or decrease. Calculate percentage change. Calculate the effect of repeated percentage changes.
- Draw triangles accurately using a ruler and protractor. Draw diagrams to scale. Draw accurate nets of 3D solids. Construct triangles using a ruler and compasses. Construct nets of 3D solids using a ruler and compasses. Bisect a line using a ruler and compasses. Construct perpendicular lines using a ruler and compasses. Bisect angles using a ruler and compasses. Draw accurate diagrams to solve problems. Draw a locus and use loci to solve problems.

Summer Term:

1. Probability
2. Scale drawings and measures
3. Graphs

Key Objectives Summer Term - To be able to:

- Calculate and compare probabilities. Decide if a game is fair. Identify mutually exclusive outcomes and events. Find the probabilities of mutually exclusive outcomes and events. Find the probability of an event not happening. Calculate the relative frequency of a value. Use relative frequency to estimate the probability of an event. Use estimated probability to calculate expected frequencies. Carry out a probability experiment. Estimate probability using data from an experiment. List all the possible outcomes of one or two events in sample space diagrams or Venn diagrams. Calculate probabilities of repeated events. Use tree diagrams to find the probabilities of two or more events
- Use scales in maps and plans. Use and interpret maps. Measure and use bearings. Draw diagrams to scale using bearings. Use, draw and interpret scale drawings. Identify congruent and similar shapes. Use congruence to solve problems in triangles and quadrilaterals. Use similarity to solve problems in 2D shapes.
- Plot straight-line graphs. Find the y-intercept and gradient of a straight-line graph. Plot graphs using the gradient and y-intercept. Use  $y = mx + c$  Find the equation of a straight-line graph. Identify parallel and perpendicular lines. Find the inverse of a linear function. Plot and use non-linear graphs.

**Key Performance Standards**

- Understand and use the laws of indices.
- Manipulate algebraic expressions
- Construct and solve equations
- Calculate the surface area and volume of prisms
- Understand and be able to use Pythagoras' Theorem
- Be able to perform and describe transformations of 2D shapes
- Convert recurring decimals into fractions
- Accurately construct diagrams using a ruler and a pair of compasses
- Draw a locus and use loci to solve problems
- Calculate and compare probabilities for 2 or more events
- Interpret and draw scale diagrams
- Understand and be able to use  $y = mx+c$  including parallel and perpendicular lines