

Curriculum Intent

Mathematic teachers are striving for all students to be successful and enjoy the subject, irrespective of their prior experience. Students will be encouraged to see the link between topics across the curriculum, as well as their application to problems, which can include a real-life emphasis.

Students are being prepared for studying the subject at GCSE, in the Sixth Form and beyond. They will appreciate its relevance to the world of work, in particular, where problem-solving strategies are needed to tackle tasks where the correct approach is not immediately clear.

As well as being knowledge with their application, students will need to adopt a risk- taking approach in order to make an initial attempt. They will need to be reflective of the solution, or progress made towards one, and ensure their final answer is communicated in a mathematically coherent manner.

Autumn Term | Sequences | Forming and solving equations & inequalities Linear graphs | Accuracy and estimation

Se	qu	e	ICE	:5

Generating terms
of a linear
sequences
Generating terms
of a non-linear
sequences
Identifying
different types of
linear and non-
linear sequences
Finding a given
term in a linear
sequence
Developing a rule
for finding a term
in a linear
sequence
Generalising the
position to term
rule for a linear
sequence (nth
term)

Linear graphs

Identify the equations of horizontal and vertical lines (from year 7) Plot coordinates from a rule to generate a straight line Develop a rule into an algebraic representation Develop concept of gradient using graphs of the form y=ax and then equations of the form y=ax+b Identify key features of a linear graph including the y-intercept and the gradient Make links between the graphical and the algebraic representation of a linear graph Recognise different algebraic representations of a linear graph Identify parallel lines from algebraic representations **Accuracy and estimation** Round numbers to a required number of decimal places Round numbers to a required number of significant figures Identify rounding errors Estimate quantities in a variety of contexts including area and perimeter

Identify and reason if an estimate is an over- or under-estimate

How is homework used to enhance learning?

- Homework book
- e Eedi
- Review exercise
- Exam Style questions



What does Excellence look like?

- Use fractions, decimals and negative in the data to find averages.
- Use algebra to find a number given the mean.
- Angles in a full circle part of a circle, arcs and sectors.
- Find areas of circles and round the answer.
- Rearranging equations.
- Substitution into formula.
- Sequences
- Ratio
- Scatter graphs
- Graphs gradient Solving equations
- Bar modelling.
- Types of shapes and properties of shapes.
- Converting units.
- Graphs.
- Negative, fraction and decimal numbers
- Properties of shapes particularly parallelograms.
- Solving equations.
- Interior angles formula.

Forming and solving equations & inequalities

Classifying expressions, equations, inequalities and identities Deriving equations from different contexts Solving linear equations with an unknown on one side (revise from Year 7) Solving linear equations with an unknown on both sides Solving equations involving fractional terms and brackets Interpreting the solution to an equation based on the context from which it is derived Interpreting relationships expressed as inequalities (revise from year 7) Deriving inequalities from contexts Forming and solving inequalities with unknown on one side Forming and solving inequalities with an unknown on both sides Representing a solution on a number line

Spring Term | Proportional reasoning | Representations and reasoning with data

Univariate data

Find the mean, median mode and range from raw datasets Use the mean, median and mode to compare data sets Use an average plus the range to compare datasets Find the mode, median and mean from tables and graphical representations (not grouped) Explore methods of data collection including surveys, questionnaires and the use of secondary data Appreciate the difference between discrete and continuous data Classify and tabulate data Conduct statistical investigations using collected data

Bivariate data

Construct scatter graphs

Examine clusters and outliers

Analyse the shape, strength and direction to make conjectures for possible bivariate relationships

Using range, mean, median and mode to investigate the characteristics of data and to compare to sets of data

Use a scatter graph to plot a line of best fit

Use a line of best fit to interpolate and extrapolate inferences

Direct and inverse proportion

Explore contexts involving proportional relationships Represent proportional relationships using tables and graphs

Represent proportional relationships algebraically Understanding about graphs of proportional relationships Solve proportion problems Meaning and properties of inverse proportional relationships

Investigate constant area as a context for indirect proportion Represent inverse proportion relationships algebraically

Ratio, real life graphs and rates of change

Use ratio notation to describe a multiplicative relationship between two quantities (revise from year 7) Solve problems involving ratios (revise from year 7)

Explore ratios in different contexts including speed and other rates of change

Contrast ratio relationships involving discrete and continuous measures

Use speed and other rates of change to draw and interpret graphical representations Explore density and concentration

as other contexts for proportional relationships



Summer Term Circles | Volume and surface area of prisms | Angles in polygons | Bearings

Circles

Explore relationship between circumference and diameter/radius

Formula for circumference

Explore relationship between area and radius

Formula for area of a circle

Area and circumference of a semi-circle and other sectors

Area and perimeter of composite shapes involving sectors of circles

Bearings

Introduce conventions for drawing and measuring bearings

Plot and measure the position of an object on a given bearing and distance from a specified point Solve problems involving bearings using angle rules from previous units

Volume and surface area of prisms

Naming prisms, nets of prisms and using language associated with 3-D shapes

Finding the volume and surface area of cuboids Finding the volume and surface area of other prisms including cylinders

Finding the volume and surface area of composite solids

Solving equations and rearranging formulae

Convert between different units of area and volume

Angles in polygons

Know the sum of interior angles of a triangle and use to solve angle problems (revise from Year 7)

Explore different methods for finding the sum of the interior angles of polygons by splitting the shape into triangles

Generalise different methods for finding the sum of interior and define the sum of the exterior angles of a polygon

Use the sum of the interior and exterior angles of a polygon to solve problems

International Opportunities

Within the curriculum

History of fractions https://nrich.maths.org/2515 Tasks for fractions https://nrich.maths.org/public/topic.php?group_id=2&code=19 Al-Khwarizmi Born 830AD Developed Algebra Muslim mathematician and astronomer whose major works introduced Hindu-Arabic numerals and the concepts of algebra into European mathematics. Fibonacci sequence – The magic of Fibonacci numbers Arthur Benjamin – TED talk Sequence within voting systems – resource within the international folder. Leonhard Euler 1707 – 1783 A Swiss mathematician who developed notation including the use of π . Srinivasa Ramanujan 1887-1920 An Indian mathematician who discovered the formula for π Using circles to estimate areas of fields. http://www.agritechtalk.org/Uno%20How%20Visit%201%20part%201.html Use temperatures of the states of America in international folder. The number of Significant figures used for different data changes depending on how accurate you need to be. John Napier 1550-1617 standardised the use of the decimal point. Thales c.636 – c.546BC A Greek philosopher found that angles at the base of an isosceles triangle are equal. Euclid born 300BC A Greek mathematician who was the 'founder of geometry' proved the exterior angles theory. Euclid born 300BC A Greek mathematician who was the 'founder of geometry' found an algorithm for finding HCF and LCM. Use different units of measurements eg. km, miles as well as different SI units. Where and why did metric come about? The golden ratio https://www.livescience.com/37704-phi-goldenratio.html Use literacy rates as percentages or any other international data. Use international data. Baye's theorem https://www.mathsisfun.com/data/bayes-theorem.html Thomas Bayes 1702 – 1761 English Statistician.

Abraham de Moivre French mathematician 1667 – 1754 developed game theory and actuarial mathematics.