Secondary Curriculum Information Pro-Forma

Subject:

Maths

Subject Leader:

V. Bardsley

YEAR 7	Theme Title	Key Areas of Knowledge Acquisition	Key Skills and Processes Learned
Term 1 (September – October)	History of Mathematics and Number Skills	• Students will learn about the development of Mathematics throughout history, focusing on six cultures contributions. • Students will be able to confidently work with fractions and decimals, including using them to solve both novel and real-life problems.	• To be able to order, round, compare and calculate with decimals. • To be able to order, compare and calculate with fractions. • To demonstrate a variety of problem solving strategies.
Term 2 (November – December)	All About Angles	• Students will use mathematical equipment to accurately draw and measure angles. • Students will explore relationships between shapes and angles and understand how angles rules can be derived.	• To be able to draw and measure angles accurately. • To calculate the values of unknown angles in 2-D shapes and between parallel lines. • To show an understanding of how to prove an angle rule.
Term 3 (January – February)	The ABC's of Algebra	• Students will be introduced to algebra, developing an understanding of the conventions used. • Students will begin to use algebra to describe real-life situations and patterns. • Students will make links between algebraic and graphical formats for representing a relationship.	• To be able to simplify and manipulate algebraic expressions and equations. • To create tables and graphs from patterns or algebraic rules. • To be able to substitute into and use real-life formulae.
Term 4 (March – April)	Mesmerising Measures	• Students will investigate the relationships between perimeter, area, surface area and volume. • Students will link classroom learning to real-world applications in planning a garden space.	• To be able to transform 2-D shapes. • To be able to use formulae to calculate perimeter, area, surface area and volume for 2-D and 3-D shapes. • To accurately use metric units to measure and estimate lengths.
Term 5 (April – May)	Staggering Statistics	• Students will develop ICT skills to collect data from their peers. • Students will be able to analyse and present their data in a meaningful format, including identifying any bias in their sources or collection methods.	• To be able to calculate averages and ranges for data sets. • To be able to interpret a data set by comparing averages or graphs. • To be able to calculate the probability of events in mathematical investigations.

Term 6 (June – July)	Numbers and Algebra	• Students will be extended in their knowledge of percentages, covering their use in real-life situations. • Students will begin to solve and manipulate algebraic equations to find solutions.	• To be able to calculate percentages of quantities, reverse percentages and increases and decreases. • To be able to solve linear equations with one or two variables using.

YEAR 8	Theme Title	Key Areas of Knowledge Acquisition	Key Skills and Processes Learned
Term 1 (September – October)	Delightful Data	• Students will critically analyse data collection methods to identify and remove bias. • Students will conduct their own investigation, including data collection, presentation and analysis.	• To be able to calculate averages and ranges from data, and use these to compare data sets. • To be able to present data in formats that enable easy comparisons to be made. • To calculate the probability of multiple events.
Term 2 (November – December)	Nifty Numbers	• Students will classify shapes based on numerical properties, including using factors, multiples and primes. • Students will be able to write and calculate with very large and very small numbers, rounding to a given degree of accuracy.	• To be able to calculate the negative numbers. • To be able to easily convert between fractions, decimals and percentages to make calculations easier.
Term 3 (January – February)	Exquisite Equations	• Students will be able to use a set of instructions to write a number pattern, or vice versa, write the rule. • Students will be able to solve a variety of equations, representing both novel and real-life situations.	• To be able to solve linear equations and simple simultaneous equations. • To substitute into and rearrange formulae from mathematics and other subjects. • To correctly use algebraic notation and conventions when manipulating expressions.
Term 4 (March – April)	Gorgeous Graphs	• Students use both pen and paper and ICT methods to construct linear graphs. • Students will discuss how a graph represents a real-life situation and what the points and variables represent.	• To be able to write a function to represent a mathematical situation. • To be able to move between an algebraic and graphical representation using gradients, points and intercepts. • To be able to graph linear and simultaneous equations.
Term 5 (April – May)	Groovy Geometry	• Students will examine building plans and maps to create links with real-life applications. • Students will recognise when shapes and objects are congruent and be able to transform them.	• To be able to identify and calculate angles in parallel lines and polygons. • To draw plans, elevations, scale drawings and bearings to represent real-life situations. • To be able to transform 2-D shapes on a grid.
Term 6 (June – July)	Numbers and Measures	• Students will build and further develop their number skills – focussing on using proportion and ratio. • Students will investigate the development of pi and how the rules for circumference and area are derived. • Students will build onto their knowledge of surface area and volume – extending to prisms.	• To be able to convert between metric units and between metric and imperial units. • To be able to use the correct formulae to calculate areas, surface areas and volumes for a variety of 2-D and 3-D shapes. • To use Pythagoras' Theorem to calculate unknown lengths in right-angled triangles.

YEAR 9	Theme Title	Key Areas of Knowledge Acquisition	Key Skills and Processes Learned
Term 1 (September – October)	Terrific Trigonometry (Set 1) Geometry Galore (Set 2)	• Students will be able to apply Pythagoras' Theorem and trigonometric functions to real-life situations. • Students will learn to differentiate between a mathematical proof and a demonstration.	• To use Pythagoras' Theorem to calculate unknown lengths in right-angled triangles. • To select and use a trigonometric function to calculate unknown lengths or angles in right-angled triangles.
		• Students will investigate the angle sizes inside and outside of polygons, and link this information to tessellation. • Students will use mathematical equipment to draw circles and areas created by moving points or lines.	• To use the interior and exterior angles of polygons rules to calculate unknown angles. • To use the correct formulae to calculate the circumference and area of circles, and the surface area and volume of prisms. • To accurately use mathematical equipment to draw 2-D shapes.
Term 2 (November – December)	Sublime Statistics	• Students will examine and draw graphs, enabling them to compare two or more sets of data. • Students will carry out a number of statistical investigations, beginning with posing a hypothesis, through to analysing and graphing their data to finally summarising their results.	• To be able to graph scatter diagrams and time series graphs. • To use graphs or averages to compare two or more data sets. • To be able to list all outcomes for two or more events and calculate the probability.
Term 3 (January – February)	Nimble Numbers	• Students will examine how numbers are used to provide information about the accuracy of measurements. • Students will use percentages in real-life situations, including compound interest and repeated percentage change.	• To be able to write numbers to a given accuracy, and explain the boundaries of measurements. • To be able to use and apply the compound interest formula to mathematical and real-life situations.
		• Students will concentrate on competency skills of multiplication and division of decimals, leading to solving functional problems. • Students will use percentages in real-life situations, including percentage change.	• To be able to calculate with fractions and decimals. • To be able to calculate percentage changes in real-life situations. • To be able to round to one significant figure to make sensible estimates.
Term 4 (March – April)	Algebra 2 Award (Set 1) Algebra is Awesome (Set 2)	• Students will have the opportunity to achieve the Algebra 2 Award, an external exam run by Edexcel. This award focuses on the consolidation of algebra skills including algebraic manipulation, drawing linear functions and graphs of real-life situations.	• To be able to recognise the role of symbols in algebra and to correctly manipulate them. • To be able to use formulae and substitute into equations to begin graphing linear functions.
		• Students will make links between numerical sequences and the functions that generate them. • Students will be able to solve a variety of equations, including using trial and improvement for quadratics.	• To be able to generate sequences from rules or formulae. • To distinguish between equations. formulae and identities. • To be able to solve linear equations, including those involving fractions.

Term	Theme Title	Key Areas of Knowledge Acquisition	Key Skills and Processes Learned
Term 5 (April – May)	Algebra 2 Award – cont. (Set 1) Quirky Quadratics (Set 2)	• Students continue with the Algebra 2 Award. • Students will demonstrate their proficiency in algebra by sitting practice papers before their actual Award in May. • Students will begin to look at quadratic expressions, focussing on how to expand and factorise. • Students will use index notation to simplify algebraic expressions. • Students will continue to investigate ways to manipulate algebraic expressions, including changing the subject of an equation.	• To be able to simplify and use index laws for powers. • To be able to factorise an algebraic expression. • To be able to use index laws to simplify expressions. • To be able to expand or factorise an algebraic expression. • To be able to expand and graph a quadratic expression.
Term 6 (June – July)	KS3 Revision and GCSE Preparation	• Students will be introduced to the new GCSE curriculum, including discussions on examinations and styles of questions. • Students will be challenged with a selection of past GCSE questions.	• To review key skills covered in KS3. • To be able to solve a variety of GCSE questions and understand and peer-mark using GCSE marking codes.

YEAR 10 (Set 1 Higher)	Theme Title	Key Areas of Knowledge Acquisition	Key Skills and Processes Learned
Examination Board and Specification Title & Number: Edexcel GCSE (9-1) Mathematics (Higher Tier) Recommended reading/preparation: 3x 40 minute homework tasks plus an addition 1 hour self-guided revision			
Term 1 (September – October)	Number (Unit 1) Algebra (Unit 2) Interpreting and Representing Data (Unit 3)	• Students will begin looking at three GCSE topics, Number, Algebra, and Interpreting and Representing Data. • Students will begin to develop their reasoning, problem solving and discussion skills to explain their thinking while answering questions.	• To use number reasoning and place value to estimate answers. • To use powers and numbers in standard form and simplify and use surds. • To solve algebraic equations and find the rules used to generate arithmetic, geometric and quadratic sequences. • To use a variety of graphs to represent data. • To review the use of averages and ranges to compare multiple data sets.
Term 2 (November – December)	Fractions, Ratio and Percentages (Unit 4) Angles and Trigonometry (Unit 5)	• Students will review their skills in using ratios and proportion and extend their use of percentages for real life problems. • Students will review facts about angles in triangles, quadrilaterals and polygons. • Students will use Pythagoras' theorem and trigonometry to solve problems found in the real world.	• To add, subtract, multiply and divide fractions and mixed numbers. • To compare ratios and solve problems using ratios and proportions. • To work out percentage increases and decreases and use percentages for real-life problems. • To use interior and exterior angles to find missing values in polygons. • To use Pythagoras' theorem and trigonometry to solve real-life problems.

Term	Unit	Learning Overview	Learning Objectives
Term 3 (January – February)	Graphs (Unit 6) Area and Volume (Unit 7)	• Students will examine linear graphs, being able to interpret how they represent real-life situations. • Students will review basic formulae for perimeter and area of 2-D shapes. • Students will extend their skills in working with surface area and volume of complex 3-D solids.	• To draw line graphs from tables of values and using the formulae $y = mx + c$ and $ax + by = c$. • To recognise and draw quadratic, cubic and reciprocal graphs. • To calculate the perimeter and area of basic and compound 2-D shapes, including sectors of circles. • To calculate the surface area and volume of prisms, cylinders and spheres, pyramids and cones.
Term 4 (March – April)	Algebra 3 Award	• Students will have the opportunity to achieve the Algebra 3 Award, an external exam run by Edexcel. This award focuses on the building of algebra skills including algebraic manipulation, solving simultaneous equations, quadratic equations and using inequalities.	• To manipulate expressions, including factorising, simplifying, changing the subject and substituting into. • To solve simultaneous equations and inequalities. • To solve quadratic equations, including using the quadratic formula and using the discriminant.
Term 5 (April – May)	Algebra 3 Award – cont.	• Students continue with the Algebra 3 Award. • Students will demonstrate their proficiency in algebra by sitting practice papers before their actual Award in May.	• To draw and sketch linear graphs, including parallel and perpendicular lines. • To draw and sketch quadratic, cubic, reciprocal and circular graphs. • To transform functions and use distance-time and speed-time graphs.
Term 6 (June – July)	Transformations and Constructions (Unit 8) Equations and Inequalities (Unit 9)	• Students will review transformations of shapes, including reflections, rotations, enlargements and translations. • Students will use mathematical equipment to draw and construct triangles and other shapes. • Students will extend their knowledge of simultaneous equations and develop more sophisticated ways to generate solutions.	• To draw and describe rotations and reflections, and negative and fractional enlargements. • To draw and use map scales and bearings. • To construct triangles and angle and line bisectors and to draw loci to solve problems. • To rearrange and solve quadratic equations, using factorisation, the quadratic formula and completing the square. • To solve simultaneous equations involving two pairs of linear functions and a linear and quadratic function.

YEAR 10 (Set 2 Higher/Foundation)	Theme Title	Key Areas of Knowledge Acquisition	Key Skills and Processes Learned
Examination Board and Specification Title & Number: Edexcel GCSE (9-1) Mathematics (Foundation Tier) Recommended reading/preparation: 3x 40 minute homework tasks plus an addition 1 hour self-guided revision			
Term 1 (September – October)	Number (Unit 1) Algebra (Unit 2)	• Students will begin looking at two GCSE topics, Number and Algebra. • Students will begin to develop their reasoning, problem solving and discussion skills to explain their thinking while answering questions.	• To use number reasoning and place value to estimate answers. • To list factors, primes, multiples, square and cubic numbers. • To manipulate algebraic expressions, including simplifying and expanding brackets. • To substitute into expressions and formulae.
Term 2 (November – December)	Fractions and Percentages (Unit 4) Angles (Unit 6)	• Students will review their skills in using fractions and decimals, and extend their use of percentages for real life problems. • Students will review facts about angles in triangles, quadrilaterals and polygons.	• To add, subtract, multiply and divide fractions and mixed numbers. • To work out percentage increases and decreases and use percentages for real-life problems. • To use angles in parallel lines, triangles and quadrilaterals. • To use interior and exterior angles to find missing values in polygons.
Term 3 (January – February)	Graphs (Unit 9) Perimeter, Area and Volume 1 (Unit 8)	• Students will examine linear graphs, being able to interpret how they represent real-life situations. • Students will review basic formulae for perimeter and area of 2-D shapes. • Students will extend their skills in working with surface area and volume of complex 3-D solids.	• To plot coordinate points on graphs. • To draw line graphs from tables of values and using the formulae $y = mx + c$. • To calculate the perimeter and area of basic and compound 2-D shapes. • To calculate the surface area and volume of prisms.
Term 4 (March – April)	Averages and Range (Unit 7) Transformations (Unit 10)	• Students will review finding averages, including mode, median, mean and range. • Students will review transformations of shapes, including reflections, rotations, enlargements and translations.	• To review the use of averages and ranges to compare multiple data sets. • To use a variety of graphs to represent data. • To draw and describe rotations and reflections, and negative and fractional enlargements.
Term 5 (April – May)	Equations, Inequalities and Sequences (Unit 5) Quadratic Equations and Graphs (Unit 16)	• Students will consolidate their knowledge of solving equations and extend to using inequalities. • Students will begin to use quadratic equations, examining their graphs and beginning to factorise.	• To review how to solve equations, including those with variables on both sides and brackets. • To use and solve equations with inequalities. • To expand double brackets and plot quadratic graphs.

| Term 6 (June – July) | Probability (Unit 13)
Multiplicative Reasoning (Unit 14) | • Students will examine probability, using Venn diagrams and tree diagrams to list outcomes.
• Students will review percentages and extend to using growth and decay formulae.
• Students will use proportions to solve real-life problems. | • To calculate the probability of single and multiple events and compare with experimental probability.
• To use Venn diagrams and tree diagrams to list outcomes for a combination of events.
• To calculate percentage increases and decreases to solve growth and decay problems.
• To work with compound measures, including distance, speed and time, |