Maths Department - Year 11 Foundation

The year 11 curriculum builds on the knowledge and skills students have acquired in year 10. Students are regularly examined at GCSE level, with a focus on improving exam technique, knowledge application and time keeping. Students are regularly assessed according to their ability to: use and apply standard techniques; interpret and communicate Mathematically and solve problems within Mathematics and other contexts.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Shirley High Curriculum Map	Theme/Topic/Skill:	Theme/Topic/Skill:	Theme/Topic/Skill:	Theme/Topic/Skill:	Theme/Topic/Skill:	Theme/Topic/Skill:
	(16) Quadratic equations and graphs (17) Perimeter, area and volume 2 (18) Fractions, indices and standard form	(19) Congruence, similarity and vectors (20) More algebra	Revision and Exam Practice	Revision and Exam Practice	Revision and Exam Practice	Public examination.
Why Now?	(16) Pupils build on their prior knowledge from units 5 and 9. (17) Pupils build on their knowledge from unit 8. Problem solving questions can be accessed using skills learnt in unit 16. (18) Pupils build on their understanding from units 1, 2 and 4.	(19) Pupils use their understanding from the previous unit to access content in this unit which consists of the most challenging geometry and measures content for this tier. (20) The course content is completed with a unit that involves the most challenging algebra content for this tier.	Having covered all content each class will begin bespoke revision based on their first set of Pre-Public Examinations (PPEs). Teachers will use the data from PPE1 to inform them of what topics their class needs to practise further.	Pupils will attempt their second set of PPEs. This will inform teachers on what topics their class needs to practise further and thus teaching will be bespoke for all classes.	Pupils will then focus on exam practice and exam technique before attempting their third and final set of PPEs. Teachers will again be teaching bespoke exam practice on select topics that their class requires.	
Fundamental Concepts	Algebra Geometry and measures Number	Geometry and measures Ratio, proportion and rates of change Algebra	Number Algebra Ratio, proportion and rates of change Geometry and measures Probability Statistics	Number Algebra Ratio, proportion and rates of change Geometry and measures Probability Statistics	Number Algebra Ratio, proportion and rates of change Geometry and measures Probability Statistics	
Students will revise and practise what they have previously learnt about …	(16) **Multiplying** double brackets. **Recognising** quadratic expressions. **Squaring** single brackets. **Plotting** graphs of quadratic functions. **Using** quadratic graphs to solve problems. **Solving** quadratic equations $ax^2 + bx + c = 0$ using a graph. **Solving** quadratic equations $ax^2 + bx + c = k$ using a graph. **Factorising** quadratic expressions. **Solving** quadratic functions algebraically. (17) **Calculating** the circumference of a circle. **Solving** problems involving the circumference of a circle. **Writing** error intervals for rounded and truncated values. **Working** out the area of a circle. **Working** out the radius or diameter of a circle. **Solving** problems involving the area of a circle. **Giving** answers in terms of π. **Understanding** and using mathematical language for circles and perimeters. **Working** out areas and perimeters of sectors of circles. **Solving** problems involving areas and perimeters of 2D shapes. **Working** out the volume and surface area of cylinders. **Working** out the volume of a pyramid. **Working** out the surface area of a pyramid. **Working** out the volume of a cone. **Working** out the surface area of a cone. **Working** out volume and surface area of a sphere. **Working** out volume and surface area of composite solids. (18) **Multiplying** and dividing mixed numbers and fractions. **Knowing** and using the laws of indices. **Writing** large numbers in standard form. **Converting** numbers from standard form into ordinary numbers. **Writing** small numbers in standard form. **Converting** numbers from standard form into ordinary numbers. **Multiplying** and dividing numbers in standard form.	(19) **Understanding** similarity. **Using** similarity to solve angle problems. **Finding** the scale factor of an enlargement. **Determining** when two shapes are similar. **Understanding** the similarity of regular polygons. **Calculating** perimeters of similar shapes. **Recognising** congruent shapes. **Using** congruence to work out unknown angles. **Using** congruence to work out unknown sides and angles in triangles and shapes made of triangles. **Adding** vectors. **Finding** the resultant of two vectors. **Subtracting** vectors. **Finding** multiples of a vector. **Identifying** two column vectors that are parallel. **Solving** problems using vectors. (20) **Drawing** and interpreting graphs of cubic functions. **Drawing** and interpreting graphs of $y = \frac{1}{x}$. **Drawing** and interpreting non-linear graphs to solve problems. **Solving** simultaneous equations by drawing a graph. **Writing** and solving simultaneous equations. **Solving** simultaneous equations algebraically. **Changing** the subject of a formula. **Identifying** expressions, equations, formulae and identities. **Proving** results using algebra.	A bespoke selection of GCSE content according to data from PPEs for the class.	A bespoke selection of GCSE content according to data from PPEs for the class.	A bespoke selection of GCSE content according to data from PPEs for the class.	

	Adding and subtracting numbers in standard form.					
Language for Life (Key terms/Vocabulary)	(16) Quadratic, function, solve, expand, factorise, simplify, expression, graph, curve, factor, coefficient, bracket. (17) Area, perimeter, formula, length, width, measurement, volume, circle, segment, arc, sector, cylinder, circumference, radius, diameter, pi, sphere, cone, hemisphere, segment, accuracy, surface area. (18) Add, subtract, multiply, divide, mixed, improper, fraction, decimal, indices, standard form, power, reciprocal, index.	(19) Vector, direction, magnitude, scalar, multiple, parallel, collinear, ratio, column vector, congruence, side, angle, compass, construction, shape, volume, length, area, volume, scale factor, enlargement, similar, perimeter. (20) Reciprocal, linear, gradient, functions, direct, indirect, estimate, cubic, subject, rearrange, simultaneous, substitution, elimination, proof.	A bespoke combination of the key terminology mentioned across the 20 units.	A bespoke combination of the key terminology mentioned across the 20 units	A bespoke combination of the key terminology mentioned across the 20 units	
Extended writing Opportunities						

Maths Across the Curriculum	(16) **Quadratic graphs** can also be used to model projectiles such as shooting a basketball in physical education. (17) **Calculating areas, surface areas and volumes** are needed in subjects such as science, geography and design and technology. (18) **Standard form** is important in physics when working with the speed of light and distances between galaxies which can be enormous as well as in biology when studying the size of bacteria or in chemistry when looking at atoms as they are so small to see with our naked eye.	(19) **Vectors** are used in the creation of accurate images in computer science. **Similarity** can be used in design and technology when altering designs or creating models of a design. (20) **Pupils** develop algebraic and graphical fluency which can be used when modelling relationships in subjects such as biology, chemistry, physics, computer science and geography.	Bespoke Curriculum applied	
Links to careers/ aspirations	(16) **Quadratic equations** are used in careers involving agriculture for tasks such as optimising the size of field and pen boundaries. (17) **Volumes** of 3D shapes must be calculated by people in product design for items such as bottles. (18) **Standard form** is used in many industries such as astronomy.	(19) **Similarity** is used in many fields of design such as fashion design and interior design. (20) **Graphs** are the visual representation of data. Graphs are used for statistical analysis, to make complex mathematical concepts easier to understand. Although many professionals use graphs in their work, science and mathematical occupations use graphs extensively.		
Cultural Capital	(16) **Pupils** can have an advantage in entrepreneurship by using their knowledge of solving quadratic equations to calculate suitable selling prices. (17) **Pupils** learn that the Greek alphabet is different to the English alphabet through learning about the constant π. (18) **Pupils** can appreciate how far the distance between planets in the solar system are by understanding numbers in standard form.	(19) **Pupils** can use their understanding of vectors to help them plan journeys using public transport. For example if a known method for travelling between two places, A and B, is unavailable there may be another way to get to the destination. (20) **Through** learning the process of solving simultaneous equations, pupils are exposed to taking a methodical approach to solving a problem that may seem initially overwhelming.		
Practical Application of Skills	(16) **Quadratic** equations equip pupils with the skills needed to calculate the selling price of an item if they know the cost for producing the item and the amount of profit they wish to make. (17) **Pupils** can calculate the area of circles or composite shapes with circles that may need to be painted or covered by a material. (18) **Pupils** can understand the answer provided by a calculator when a number is presented in standard form.	(19) **Pupils** can use volume similarity to inform purchases of storage containers. For example, if two containers were available for purchase whereby the larger container was bigger by a scale factor of 3, a pupil could compare the price of the larger container to the price of 3 of the smaller containers knowing that their capacity would be equal. (20) **Pupils** can form and solve simultaneous equations to find unknown values such as the fixed price or standing charge of an energy bill.		