MATHEMATICS FOUNDATION TIER

Year 11

What are the aims and intentions of this curriculum?

The aim of the curriculum is to consolidate and extend students' knowledge on what they did in KS3. It is the aim of the curriculum to develop students' problem solving and reasoning skills in the areas of: Numbers, algebra, ratio, proportion and rate of change, geometry, measurement, probability and statistics. Students will ultimately be ready to sit their Foundation GCSE examination at the end of this program of study.

Term	Topics	Knowledge and key terms	Skills developed	Assessment
Autumn 1	*Fractions, indices and standard form* *Congruence, similarity and vectors*	Mixed numbers, fractions, laws of indices, standard form, ordinary numbers, negative powers Similarity, angle, scale factor, enlargement, regular polygons	Students will develop the ability to multiply and divide mixed numbers and fractions. Apply and know and use the laws of indices. Write large and small numbers in standard form. Convert large and small numbers from standard form into ordinary numbers and vice versa. Add subtract, multiply and divide numbers in standard form. Students will understand what similarity is and be able to solve angle problems. Find the scale factor of an enlargement. Understand the similarity of regular polygons. Calculate perimeters of similar shapes.	Pixi Aiming for grade 5 booklet Mathswatch- http://www.mathswatch.co.uk/ Mymaths- https://www.mymaths.co.uk/ Kerboodle- https://www.kerboodle.com/users/login EDEXCEL GCSE past paper End of topic class test Stretch and challenge feedback sheet (fortnightly)
Autumn 2	*Congruence, similarity and vectors* *More algebra*	Congruent, shapes, angles, sides, vectors, resultant, multiples Graphs, cubic functions, non-linear, simultaneous equations, algebra, subject, formula, rearrange, expressions, equations, formulae	Recognise congruent shapes and use congruence to work out unknown angles and sides. They will learn how to add and subtract vectors, find the resultant of two vectors and find multiples of a vector. In this topic students will draw and interpret graphs of cubic functions, graphs of y = 1/x and non-linear graphs to solve problems. Solve simultaneous equations by drawing a graph. Write and solve simultaneous equations algebraically. Students will learn to change the subject of a formula and be able to Identify expressions, equations, formulae and identities.	Pixi Aiming for grade 5 booklet Mathswatch - http://www.mathswatch.co.uk/ Mymaths- https://www.mymaths.co.uk/ Kerboodle- https://www.kerboodle.com/users/login EDEXCEL GCSE past paper End of topic class test Stretch and challenge feedback sheet (fortnightly)

Spring 1	*Transformations* *Ratio and proportion* *Right-angled triangles*	Reflection, translate, enlargement, rotation, mirror line, scale factor, centre of enlargement, shape Ratio, simplest, convert, quantity, compare, proportion Pythagoras theorem, length, hypotenuse, right-angled, sine, cosine, tangent, elevation, depression	In this topic students will recall the four main types pf transformations and be able to perform all four. Translation, reflection, rotation and enlargement. They will recall how to use a column vector to describe a translation, draw a reflection of a shape in a mirror line and on a coordinate grid, rotate a shape on a coordinate grid and describe a rotation, enlarge a shape by a scale factor and by using a centre of enlargement. In this topic students will solve problems using ratios, use ratios to convert between units, write and use ratios for shapes and their enlargements. We will use the unitary method to solve proportion problems. Recognise and use direct proportion on a graph. Understand the link between the unit ratio and the gradient. Solve word problems involving direct and inverse proportion. Understand and use Pythagoras' theorem to calculate the length of the hypotenuse and short side in a right-angled triangle. Understand and recall the sine, cosine and tangent ratio in right-angled triangles and use the sine, cosine and tangent ratio to calculate the length of a side and degree of an angle in a right-angled triangle. We will also solve problems using an angle of elevation or depression and students should know the exact values of the sine, cosine and tangent of some angles.	Pixi Aiming for grade 5 booklet Mathswatch - http://www.mathswatch.co.uk/ Mymaths- https://www.mymaths.co.uk/ Kerboodle- https://www.kerboodle.com/users/login EDEXCEL GCSE past paper End of topic class test Stretch and challenge feedback sheet (fortnightly)
Spring 2	*Multiplicative reasoning* *Constructions, loci and bearings*	percentage, profit, loss, increase, decrease, change, growth, decay, compound measures, distance, average speed, ratio, proportion, inverse proportion. loci, symmetry, plan, elevation, congruent, construction, bearings,	Students will recall how to calculate a percentage profit or loss and express a given number as a percentage of another in more complex situations. We will look at finding the original amount given the final amount after a percentage increase or decrease. Solve growth and decay problems and solve problems involving compound measures. Convert between metric speed measures and calculate average speed, distance and time. Use formulae to calculate speed and acceleration. Use ratio and proportion in measures and conversions and use inverse proportions. In this topic students will explore congruent triangles and properties, this includes SSS, ASA, SAS and RHS. Identify and sketch planes of symmetry of 3D shapes. Students will recall how to correctly interpret scales in real-life contexts, use scales on maps and diagrams to work out lengths and distances. Students will draw lengths and distances correctly on given	Pixi Aiming for grade 5 booklet Mathswatch - http://www.mathswatch.co.uk/ Mymaths- https://www.mymaths.co.uk/ Kerboodle- https://www.kerboodle.com/users/login EDEXCEL GCSE past paper End of topic class test Stretch and challenge feedback sheet (fortnightly)

	perimeter area and volume *16 Quadratic equations and graphs*	circle, circumference, Area, cylinder, volume, surface area, composite solids, quadratic equations, expressions, term, coefficient, variable, square	scale drawings, draw angles and 2D shapes using a ruler, protractor and compasses. We will also look at different types of constructions and use three-figure bearings. In this topic students will calculate the circumference and area of a circle. Work out areas and perimeter of semicircles and quarter circle. We will look at working out the volume and surface area of cylinders, pyramid, cone and sphere and composite solids. Students will also work out percentage error intervals. In this topic students will recall how to multiply double brackets and be able to Recognise quadratic expressions and plot graphs of quadratic functions. They will Use quadratic graphs to solve problems and solve quadratic equations $ax^2 + bx + c = 0$ using a graph. Also, solve quadratic equations $ax^2 + bx + c = k$ using a graph.	