Curriculum Map Year 10 - Mathematics

Topic Name	Term	Content / skills developed with link to NC / exam board subject content (if applicable)	Reflection on previous learning	Progress to future learning	Global Citizenship links	Qatar National Identity links
	1	• **Use a scientific electronic calculator to determine numerical results**	**Understanding the different modes on a calculator**	**To use more advanced calculator functions**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	1	• **Determine the coordinates of the midpoint of a line segment, given the coordinates of the two end points. Include the use of Pythagoras.** • **Find the gradient of a straight line** • **Recognise that equations of the form** • **y = mx + c are straight line graphs with gradient m and intercept on the y-axis at the point (0, c)** • **Recognise, generate points and plot graphs of linear functions** • **Calculate the gradient of a straight line given the coordinates of two points** • **Find the equation of a straight line parallel to a given line;**	**Plotting coordinates Knowing how to use the axes.**	**Read linear relationships, aiding in visualising data trends or solving equations. Parallel lines have equal slopes but different y-intercepts when graphed, Simplifying equation solutions.**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	1	• **Understand that enlargements are specified by a centre and a scale factor** • **Understand that enlargements preserve angles and not lengths** • **Enlarge a shape given the scale factor**	**Understanding the use of scale factor**	**Further application of the use of scale factor in particular in different dimensions.**	PRIDE values Prepare for challenge.	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

		• **Identify and give complete descriptions of transformations** • **Combine transformation**			Developing skills for the future	
	1	• **Calculate the exact solution of two simultaneous equations in two unknowns** • **Interpret the equations as lines and the common solution as the point of intersection** • **Knows the position of the graphical solution of simultaneous equations.**	**Plotting linear graphs**	**Sine and cosine curves**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	1	• **Find the perimeter of shapes made from triangles and rectangles** • **Find the area of simple shapes using the formulae for the areas of triangles and rectangles** • **Find the area of parallelograms and trapezia** • **Find perimeters and areas of sectors of circles** • **Find the surface area of simple shapes using the area formulae for triangles and rectangles** • **Find the surface area of a cylinder** • **Find the volume of prisms, including cuboids and cylinders, using an appropriate formula**	**Volume and surface area of cubes and cuboid,** **Area of common shapes**	**Volume of spheres and cones**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	1	• **Understand the concept of average** • **Calculate the mean, median, mode and range for a discrete data set** • **Calculate an estimate for the mean for grouped data** • **Identify the modal class for grouped data**	**Calculating mean from a set of numbers**	**Interpreting processed data**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

		• **Estimate the median from a cumulative frequency diagram** • **Understand the concept of a measure of spread** • **Find the interquartile range from a discrete data set** • **Estimate the interquartile range from a cumulative frequency diagram**				
	2	• **Understand the definition of a set** • **Use the set notation ex: U, ∩, ∉, ⊇, ∈** • **Understand the concept of the universal set and the empty set and the symbols for these sets** • **Understand and use the complement of a set** • **Use Venn diagrams to represent sets** • **Find probabilities from a Venn diagram** • **Understand sets defined in algebraic terms, and understand and use subsets** • **Use Venn diagrams to represent sets and the number of elements in sets** • **Use the notation n(A) for the number of elements in the set A** • **Use sets in practical situations** • **Additional Teacher Notes : When drawing a Venn diagram it is a good idea to put members in the intersection first.**	**Organising information** **Use of Venn diagrams**	**Further interpretation of sets and Venns**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	2	• **derive a formula or expression** • **Understand the process of manipulating formulae or equations to change the subject, to include cases**	**Solving equations** **Use of scientific formulae in maths and science**	**Rearranging formula in context of other mathematical concepts**	PRIDE values Prepare for challenge.	**Sustainability**: self esteem and participation

		where the subject may appear twice or a power of the subject occurs. • **Rearranging formulae that appear in the curriculum including cosine rule, SUVAT etc**	**Substitution into a formula**		Developing skills for the future	**Sustainability**: responsibility and creativity
	2	• **use index notation involving fractional, negative and zero powers** • **Use index laws in simple cases** • **Use index notation and index laws for multiplication and division of positive and negative integer powers including zero** • **Stretch challenge by using questions where solving equations are required or where students are required to find the common base**	**Know square and cube numbers.** **Basic rules of indices** **Product of primes**	**Solving equations using indices**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	2	• **Calculate the gradient of a straight line given the coordinates of two points** • **Find the equation of a straight line perpendicular to a given line.** • **Note: Time must be given for the application of coordinate geometry to solve problems**	**Plotting coordinates** **Knowing how to use the axes.**	**Read linear relationships, aiding in visualising data trends or solving equations.** **Parallel lines have equal slopes but different y-intercepts when graphed,** **Simplifying equation solutions.**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	3	• **Understand congruence as meaning the same shape and size. (No proofs required)** • **Understand that two or more polygons with the same shape and size are said to be congruent to each other** • **Understand and use the geometrical properties that similar figures have corresponding lengths in the**	**Simplifying ratio** **Dividing into ratio**	**Scale factor** **Application of ratio in different dimensions** **Application of ratio in context of other concepts**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

		same ratio but corresponding angles remain unchanged • **Understand that areas of similar figures are in the ratio of the square of corresponding sides** • **Understand that volumes of similar figures are in the ratio of the cube of corresponding sides** • **Use areas and volumes of similar figures in solving problems**				
	3	• **Expand the product of two or more linear expressions** • **Understand the concept of a quadratic expression and be able to factorise such expressions** • **Manipulate algebraic fractions where the numerator and/or the denominator can be numeric, linear or quadratic** • **Quadratic formula**	• **Product of primes** • **Understanding of factors and HCF** • **Factorising common factors**	**Completing the square.**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	3	• **Solve quadratic equations by factorisation** • **Solve quadratic equations by using the quadratic formula** • **Form and solve quadratic equations from data given in a context**	**Solving linear equations**	**Simultaneous equations using quadratics.**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	3	• **Solve quadratic equations by factorisation** • **Solve quadratic equations by using the quadratic formula** • **Form and solve quadratic equations from data given in a context**	**Understanding of factor pairs. Understanding the root function. Square numbers**	**Use in context of Algebra**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

	4	• **Further manipulations of surds , including rationalising a denominator** • **Note: Time to be spent on proofs and higher level application and problem solving"**	**Equivalent fractions Simplifying fractions Understanding of the difference of squared**	**Use in context of algebra**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	4	• **Construct cumulative frequency diagrams from tabulated data** • **Use cumulative frequency diagrams** • **Estimate the median from a cumulative frequency diagram** • **Understand the concept of a measure of spread** • **Find the interquartile range from a discrete data set** • **Estimate the interquartile range from a cumulative frequency diagram**	**Plotting coordinates Drawing statistical graphs**	**Interpreting data and comparison of data.**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	4	• **represent simple linear inequalities on rectangular Cartesian graphs** • **Identify regions on rectangular Cartesian graphs defined by simple linear inequalities** • **Identify harder examples of regions defined by linear inequalities**	**Using accurate language using inequalities. Graphing linear equations**	**Advance linear programming**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	4	• **Use the process of proportionality to evaluate unknown quantities** • **Calculate an unknown quantity from quantities that vary in direct proportion** • **Solve word problems about ratio and proportion** • **Carry out calculations using standard units of mass,**	**Ratio VS proportion- understand the differences. Application of proportion**	**Understand the purpose of a constant K** **Further problem solving**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

		length, area, volume and capacity • **Understand and carry out calculations using time, and carry out calculations using money, including converting between currencies** • **Set up problems involving direct or inverse proportion and relate algebraic solutions to graphical representation of the equation** • **Note: Stretch and challenge using questions from different context**				
	4	• **construct and interpret histograms**	**Constructing bar charts**	**Interpreting histograms.**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	5	• **Recognise the term 'cyclic quadrilateral'** • **Understand and use angle properties of the circle including:** • **(i) angle subtended by an arc at the centre of a circle is twice the angle subtended at any point on the remaining part of the circumference** • **(ii)angle subtended at the circumference by a diameter is a right angle** • **(iii) angles in the same segment are equal** • **(iv) the sum of the opposite angles of a cyclic quadrilateral is 180°** • **(v) the alternate segment theorem**	**Angles in a straight line** **Angles in triangles** **Angles in quadrilaterals.** **Angles in parallel lines.** **Angles in polygons**	**Intersecting chords**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

	5	• **Manipulate algebraic fractions where the numerator and/or the denominator can be numeric, linear or quadratic** • **Solve quadratic equations in fractions** • **2.4A solve linear equations, with integer or fractional coefficients, in one unknown in which the unknown appears on either side or both sides or as the denominator of the equation**	**Factoring quadratics**	**Application of the order of operations when working with algebraic fractions**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	5	• **Use the addition rule of probability for mutually exclusive events** • **Understand and use the term 'expected frequency'** • **Draw and use tree diagrams** • **Determine the probability that two or more independent events will occur** • **Use simple conditional probability when combining events** • **Apply probability to simple problems**	**Understanding that probability adds to 1.** **Listing probability**	**Using algebra when working with probability**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	5	• **find perimeters and areas of sectors of circles** • **Find the area/ perimeter of compound shapes using arcs and sectors..** • **Application of Arcs and sectors on extension problem solving questions**	**Area and perimeter of circles**	**Application of arcs and sectors in compound shapes**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	5	• **recognise, generate points and plot graphs of quadratic functions** • **Recognise, plot and draw graphs with equation:** **in which:** • **(i)the constants are integers and some could be zero**	**Plotting quadratics using the table.** **Know how to work out the coordinates using a calculator**	**Transformation of graphs**	PRIDE values Prepare for challenge.	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

		• **(ii)the letters x and y can be replaced with any other two letters or:** **in which:** • **(i) the constants are numerical and at least three of them are zero** • **(ii)the letters x and y can be replaced with any other two letters or:** • **for angles of any size (in degrees)** **Additional Teacher Notes:** **Remind students to use brackets for negative numbers when using a calculator, and remind them of the importance of knowing when to leave answers in surd form.** • **Clear presentation of working out is essential.** • **Link with graphical representations**			Developing skills for the future	
	5	**Have a clear understanding of the meaning of fractional power of m over n** • **Understand fractional indices for roots and powers.** • **Simplify expressions with fractional indices.** • **Solve equations involving fractional indices.** • **Rationalise denominators with fractional indices.** • **Apply laws of indices to expressions with fractional powers.** • **Solve problems involving surds and fractional indices.**	**Knowing the rules of indices**	**Combining all the rules of indices**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
	5	• **find the surface area and volume of pyramids, cones and spheres using relevant formulae.** • **Apply these to solve problems**	**Volume and surface area of prisms**	**Working on compound objects including cones, cylinders and spheres.**	PRIDE values Prepare for challenge.	**Sustainability**: self esteem and participation

					Developing skills for the future	**Sustainability**: responsibility and creativity
	5	• **•Combine translations, reflections, rotations, and enlargements.** • **•Apply multiple transformations to geometric figures.** • **•Understand the order of transformations.** • **•Solve problems involving combined transformations**	**Know how to reflect, rotate, translate and enlarge**	**Application of transformation of curves including trigonometric curves**	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity