Queen Elizabeth High School

Scheme of Work	SUBJECT: Mathematics		YEAR: 11 Foundation ~ Autumn term 1
	Volume	**Direct and inverse proportion**	**Algebra and graphs**
Key concepts	1) Compare lengths, areas and volumes using ratio notation and scale factors. Making links to similarity 2) Know and apply formulae to calculate the volume of cuboids and other right prisms (including cylinders) 3) Calculate the volume of spheres, pyramids, cones and composite solids. Calculate exactly with multiples of `pi`	1) Solve problems involving direct and inverse proportion, including graphical and algebraic representations. • Unitary proportion • Recipes • Best buys 2) Understand that x is inversely proportional to y is equivalent to x is proportional to $\frac{1}{y}$ 3) Interpret equations that describe direct and inverse proportion 4) Recognise and interpret graphs that illustrate direct and inverse proportion	1) Solve linear equations in one unknown algebraically, Including those with the unknown on both sides of the equation 2) Find approximate solutions using a graph 3) Translate simple situations or procedures into algebraic expressions or formulae 4) derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution
Themes	**Volume of 3D shapes**	**Direct and inverse proportion**	**Equations**

Challenge	1) Solve problems involving lengths, areas and volume by expressing ratios as fractions then creating and solving equations. 1) Express the lengths of similar shapes as ratios, hence use these to solve similar shape problems. 2) Calculate the volume of compound shapes made from cuboids. 2) Solve multi-step questions involving volume of prisms 3) Calculate volume of frustums	1) Multi-step questions involving direct and inverse proportion. 1) Exam questions 2) Link equations with graphs for direct and inverse proportion	1) Solve equations with unknown on each side and with brackets 1) Solving simultaneous equations (both linear) 2) Recap drawing graphs using the gradient and intercept or cover up method, then use the graph to estimate answers/solutions 4) Derive a pair of simultaneous equations and solve
Support	1) Recap the students understanding of ratio notation by representing everyday situations using ratios. 2) Explain the meaning of volume. Begin by working out volume of cubes and cubiods by counting cubes. Extend to using the formula 3) Recap methods of substitution into formula 3) Stress to students that the formulas for volume of these shapes will be	1) Recap their understanding of direct proportion, i.e. as one variable increases so does the other, relating to real life situations. 1) Recap their understanding of inverse proportion, i.e. as one variable increases so does the other, relating to real life situations.	1) Solving one and two step equations 2) Recap constructing straight line graphs and use theses to estimate answers 3) Express simple situations as an algebraic expression 4) Create an solve equations to solve simple problems

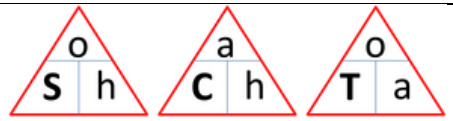
	given in the question. Hence, they will just need to be able substitute in the correct values, evaluate it in the correct order and then interpret their answer.		
Literacy focus	Key words: Length, area, volume, ratio, similarity, cube, cuboid, prisms, cylinders, spheres, cones, pyramids, frustum, compound shapes	Key words: Proportion, direct, inverse, graph, equation, unitary, recipes	Key words: Equation, simultaneous, solve, solution, estimate, create
Cross-curricular links			
SMSC & MBV			
ASSESSMENTS	Assessment 1 ~ October	Assessment 1 ~ October	Assessment 1 ~ October
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class

Queen Elizabeth High School

Scheme of Work	SUBJECT: Mathematics	YEAR: 11 Foundation ~ Autumn term 2

	Inequalities	**Trigonometry**	**Graph sketching**
Key concepts	1) Solve linear inequalities in one variable 2) Represent the solution set on a number line	1) Know and use the trigonometric ratios $Sin\ \theta = \frac{Oppossite}{Hypotenuse}$ $Cos\ \theta = \frac{Adjacent}{Hypotenuse}$ $Tan\ \theta = \frac{opposite}{Adjacent}$ 2) Apply them to find angles and lengths in right-angled triangles in two dimensional figures (Review of year 10)	1) Recognise, sketch and interpret graphs of linear functions, quadratic functions, simple cubic functions and the reciprocal function $y = \frac{1}{x}$ with x = 0

		3) Know the exact values of 0°, 30° 45°, 60° and 90° 4) Compare lengths using ratio notation (Review of Year 10) 5) Make links to trigonometric ratios	
Themes	**Inequalities**	**Trigonometry recap**	**Recognising harder graphs**
Challenge	1) Solve inequalities with unknowns on both sides, involving brackets and fractions. 1) Solving double inequalities, i.e. splitting into 2 single inequalities.	1) Either use the triangles below or SOHCAHTOA to help learn the ratios 2) Find the height of isosceles or equilateral triangles 2) Apply methods to multi-step questions which involve other areas of mathematics to solve 3) Just need to know the equivalents to the ratios, (Trig song is useful https://www.youtube.com/watch?v=_IR9wRQI4JY	1) Plot cubic and reciprocal graphs, ensuring students area aware of their basic shapes 1) Identify the negative graphs of linear, cubic and quadratic 1) Identify the coordinates of the turning point of a graph
Support	1) Solve one step inequalities, making link to equations and using the same methods used to solve equations	1) Labelling the sides of the triangles 1) Make use of triangles to help students learn the ratios	1) Use matching exercising to match the equation to its graph 1) When plotting quadratic graphs use a calculator to work out the y

		 1) Stress the importance of showing all workings out to help learn the methods and procedures required. 2) missing sides and angles in right angled triangles only	values. Ensuring students put brackets around the negative values of x.
Literacy focus	Key words: Inequalities, equations, solve, number line, represent	Key words: Right angled triangle, isosceles, equilateral, ratio, sine, cosine, tangent, adjacent, opposite, hypotenuse	Key words: Linear, quadratic, cubic, reciprocal, axes
Cross-curricular links		Design and technology	Science, Geography
SMSC & MBV			
ASSESSMENTS	Assessment 2 ~ Mocks (1)	Assessment 2 ~ Mock (1)	Assessment 2 ~ Mock (1)
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class

Queen Elizabeth High School

Scheme of Work	SUBJECT: Mathematics	YEAR: 11 Foundation ~ Spring term 1

	Solving quadratic equations	**Vectors**	**Growth and decay**
Key concepts	1) Solve quadratic equations algebraically by factorising 2) Find approximate solutions using a graph	**1)** Apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representation of vectors *(Recap describing transformations using column vectors)*	1) Set up, solve and interpret the answers in growth and decay problems, including compound interest
Themes	**Quadratic equations**	**Vectors**	**Growth and decay**
Challenge	1) Factorising quadratic equations of the form $x^2 + bx + c$ 2) Make the links between the roots of a graph and the solutions of a quadratic equation. 2) Identify the coordinates of the turning point of a graph	1) Add and subtract multiples of vectors 1) Apply vectors to simple geometric problems	1) Understand an apply the formula for calculating growth or decay

Support	1) Recap factorising into single brackets 2) Find approximate solutions from linear graphs, 2) Find solutions to simultaneous equations graphically 2) Extend to quadratic graphs where the graph is already drawn for them.	1) Describe transformation of shapes using column vectors 1) Evaluate simple vectors using substitution methods.	1) Recap calculating with percentages, percentage of a quantity and percentage increase and decrease 1) Solve simple multi-step problems involving percentages
Literacy focus	Key words: Quadratic, equation, solve, factorise, turning point, simultaneous equations, graphically	Key words: Vectors, addition, subtraction, multiply, notation	Key words: Percentage, growth, decay, depreciation, increase, decrease, multiplier
Cross-curricular links			
SMSC & MBV			
ASSESSMENTS	Assessment ~ Mock (2)	Assessment ~ Mock (2)	Assessment ~ Mock (2)
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class

Queen Elizabeth High School

Scheme of Work	SUBJECT: Mathematics	YEAR: 11 Foundation ~ Spring term 2
	Quadratic graphs	**Revision**
Key concepts	1) Recognise, sketch and interpret graphs of quadratic functions 2) Identify and interpret roots, intercepts and turning points of quadratic functions graphically 3) Deduce roots algebraically	
Themes	**Quadratics**	
Challenge	2) Make the links between the roots of a graph and the solutions of a quadratic equation. 2) Identify the coordinates of the turning point of a graph 3) Calculate roots by factorising quadratics	
Support	1) Plot quadratic graphs, remembering to use a calculator to work out the y values. Ensuring students put brackets around the negative values of x.	

	3) Recap simple factorisation	
Literacy focus	Key words: Sketch, quadratic, graphs, factorise, roots, turning point	Key words
Cross-curricular links		
SMSC & MBV		
ASSESSMENTS	Assessment ~ Mock (2)	Assessment ~ Mock (2)
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class

Queen Elizabeth High School

Scheme of Work	SUBJECT: Mathematics		YEAR: 11 Foundation ~Summer term 1
	Revision		
Key concepts			
Themes			
Challenge			
Support			
Literacy focus	Key words		
Cross-curricular links			
SMSC & MBV			
ASSESSMENTS	Assessment ~ Actual exam		
Out of school learning			