### Mathematics Scheme of Learning Year 11 – Term 1

#### Intent – Rationale "Maths is for everyone". AQA GCSE Mathematics is designed to be diverse, engaging and essential to equip all students with the skills and knowledge to reach their future destination. Opportunities to make connections, generalise and apply are embedded where appropriate for each individual student. References to careers and future learning and shared with students. Sequencing – what prior learning does this topic build upon? Sequencing – what subsequent learning does this topic feed into? Year 10 Term 3 basic probability (not conditional) A level trigonometry including sectors, radians and identities Year 10 Term 6 changing the subject (HSL) A level statistics • Year 9 scattergraphs, Year 10 collecting and representing data A level rates of change • including cf diagrams & box plots • A level numerical methods What are the links with other subjects in the curriculum? What are the links to SMSC, British Values and Careers? SP2&3, C1 Science formulae SP2&3, C1 Science, Geography and Psychology data analysis • GB4efghi Technology, product evaluations • What are the opportunities for developing literacy skills and What are the opportunities for developing mathematical skills? developing learner confidence and enjoyment in reading? Please fill this in with your own suggestions alternatively the Recognise relationships between quadratic equations and their ٠ LRC team will provide some suggested titles/links graphical representation. Use statistical values to conclude and justiy, including comparing distributions

# <u>Mathematics Scheme of Learning</u> <u>Year 11 – Term 1</u>

#### Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?					
Know					
Draw and use tree diagrams and use to calculate probabilities for independer rule	Draw and use tree diagrams and use to calculate probabilities for independent and dependent events including knowing when to use the OR rule & AND rule.				
Factorise quadratic equations with coefficients of x <sup>2</sup> . Solve quadratic equadratic equations. Complete the square wh	quations by factorising. Know the quadratic formula and use so solve nere a =1, use to solve quadratic equations.				
Draw and interpret a scatterdiagram including describing correla	tion, relationship shown, drawing a line of best fit to estimate.				
App	ly				
Use of tree diagram to calculate	probability of combined event.				
Explore causation vs correlation and when an	estimate is interpolation or extrapolation.				
Exte	nd				
Algebraic probab	pility problems				
Solve quadratic equations and relate s	olutions to graphical representation.				
Finding an algebraic co	ommon denominator				
Explain why an estimate from a scatt	ergraph is not reliable/appropriate				
What subject specific language will be used and developed in this topic?	What opportunities are available for assessing the progress of students?				

<ul> <li>Formulae, formula, expressions, equations, identity, linear, quadratic, term, inverse, expanding, factorising, common factor, substitution, subject, simplify, simplify fully, equivalent, complete the square, coefficient,</li> <li>Ensure secure in exam command words, eg expanding is to remove from brackets,</li> </ul>			AQA topic <u>open book</u> assessments (homework) Exam question practice – open book Mini quizzes including Kahoot Multiple choice to address misconceptions Recall starters: • LLLWLTLY • Corbett 5 a day • Whiterose maths KS4 problem of the day • Mini quiz on circle theorems, compound measures, functions		
Probability	R	А	G		
Apply systematic listing including using the product rule					
Calculate the probability of independent events					
Draw and use tree diagrams and use to calculate probabilities including knowing when to use the OR rule & AND rule.					
Calculate conditional probability					

Quadratics	R	А	G
Factorise quadratic expressions			
Solve quadratic equations by factorising			
Solve quadratic equations using the formula			
Complete the Square			
Solve quadratic equation by completing the square			

Algebraic Fractions	R	А	G
Simplify algebraic expressions involving algebraic fractions			

Manipulate and simplify algebraic expressions involving algebraic fractions		
Solve equations involving algebraic fractions		

Scatter Graphs	R	А	G
Draw scatter graphs			
Recognise positive and negative correlation			
Describe the relationship between the two variables			
Draw and use lines of best fit			
Understand correlation and causation. Interpolate and extrapolate knowing when you should be cautious			

Statistical Measures	R	А	G
Interpret, analyse and compare data by comparing and commenting in context on:			
1. Use appropriate measures of central tendency: mean, median, mode and modal class.			
2. Use of spread, range, quartiles and interquartile range			
Apply statistics to describe a population			
Know the limitations of sampling.			

#### Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
Combinations &	Recap basic probability		Powerpoint
Permutations	Apply systematic listing strategies including using the product rule		Emphasise difference between combination and permutation

Probability	Calculate the probability of independent events	Recap, algebraic problems	Powerpoint
	Draw and use tree diagrams and use to calculate probabilities including knowing when to use the OR rule & AND rule.	Recap, algebraic problems	
	Calculate conditional probability	Algebraic problems	
Quadratics	Factorise quadratic expressions Difference of two squares (DOTS)	Recognise for a =1 x and + integers	Begin with coefficient of x <sup>2</sup> to teach <u>method</u> . <u>https://www.youtube.com/watch?v=v2sPNXdabl0</u> Blue Oxford textbook has good practice
	Solve quadratic equations by factorising	Graphical representation of solutions	Blue Oxford textbook has good practice <u>Mixed of quadratic and common factor</u> (students find challenging to identify when to put in to two brackets
	Solve quadratic equations using the formula		Pop goes the weasel song https://www.youtube.com/watch?v=2lbABbfU6Zc
	Complete the Square	Coefficient of x <sup>2</sup> , including -1 Turning points	Challenge worksheet Complete the square and sketch
Algebraic Fractions	Simplify algebraic expressions involving algebraic fractions		Corbett maths
	Manipulate and simplify algebraic expressions involving algebraic fractions	Adding/subtracting where common denominator is needed to be found.	
	Solve equations involving algebraic fractions		
Scattergraphs	Draw scattergraphs. Recognise positive and negative correlation. Describe the relationship between the two		Check prior knowledge, ensure know different between correlation and relationship. Must draw line of best fit to estimate. True or False extrapolation worksheet

	variables. Draw and use lines of best fit		Bee problem
	Understand correlation and causation. Interpolate and extrapolate knowing when you should be cautious		Causation vs correlation discussion: <u>http://www.tylervigen.com/spurious-correlations</u> worksheet
Statistical Measures	Interpret, analyse and compare data by comparing and commenting in context on: 1. Use appropriate measures of central tendency: mean, median, mode and modal class. 2. Use of spread, range, quartiles and interquartile range	Less structure – choose best measure to make justification: girls are better at maths task can be scaffolded	Statistical Statements worksheet Girls are better at maths worksheet
	Apply statistics to describe a population. Know the limitations of sampling.		Most resources are Edexcel but ensure are aware of random sampling.