KESTEVEN AND SLEAFORD HIGH SCHOOL

Mathematics Scheme of Learning
Year 10 – Term 3

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 1 linear and quadratic equations - Year 9 Term 2 fractions and decimals - Year 9 Term 2 probability including venn diagrams and tree diagrams - Year 9 Term 3 Pythagoras in 3D and introduction to trigonometry - Year 9 Term 2 interior exterior angles of polygons	- GCSE graph transformations, A level further graph transformations and modelling problems - At GCSE application in many contexts calculating with fractions and decimals confidently - At GCSE dependent probability and set notation, A level statistics using probability tables including binomial
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
Base the content here on what you already know but there will be time in future to liaise further as part of our collaborative work	SP2&3, C1 SP2&3, C1 GB4efghi
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	**What are the opportunities for developing mathematical skills?**

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• Please fill this in with your own suggestions alternatively the LRC team will provide some suggested titles/links	• Real life graph applications (graphing stories) applications to kinematics • Mental arithmetic working with fractions & decimals • Importance of language in calculating chance • Trigonometry & Pythagoras real life applications

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Year 10– Term 3

Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?
Know Plot and interpret linear and quadratic graphs using a table of values. Sketch reciprocal and exponential graphs. Sketch simple kinematic graphs. Order positive and negative integers, decimals and fractions using symbols. Use all four operations with integers, fractions and decimals. Express recurring decimals as a fraction. Know and use the properties of prime factors, factors, multiples and squares. Use prime factorisation to find HCF and LCM using lists or venn diagrams. Draw and use a venn diagram to calculate probability of two events. Record and analyse data in frequency trees and tables to calculate probabilities. Calculate relative frequencies and identify reliable probabilities and bias. Apply systematic listing including using the product rule Know and use 3D Pythagoras. Use basic trigonometry to calculate missing angles and sides. Use Pythagoras and Trigonometry combined in problems. **Apply** Interpret graphs in a context including depth/time, distance/time, using gradient and y intercept. Fraction and decimal problems in context. Probability in context Trigonometry context problems. Make reference to career use eg architect, engineering, construction, graphic design.

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Extend

BIDMAS and negative gradients for linear and quadratic equations to plot.

Express recurring decimals greater than 1 as a fraction. Present as a "prove that" problem or "show that".

Algebraic probability problems. Set notation.

Trigonometry context problems – no diagram, angles of elevation and depression.

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<th>What subject specific language will be used and developed in this topic?</th>
<th>What opportunities are available for assessing the progress of students?</th>
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- Plot, linear, quadratic, intercept, gradient, functions, reciprocal, exponential, cubic, kinematic, speed, distance, time, acceleration, axis, roots, intersect, simultaneous
- Proper fraction, improper fraction, mixed number, simplify, numerator, denominator, equivalent, common denominator, LCM, operation, decimal, place value, terminating, recurring, rational number, irrational number
- Probability, sets, and, or, intersection, Venn diagram, tree diagram, events, outcomes, dependent, independent, conditional probability, replacement, without replacement, exhaustive, sample space, two-way table, product rule, systematic listing
- Trigonometric ratios, Pythagoras, hypotenuse, adjacent, opposite, sine, cosine, tangent, angle, theta, obtuse, acute, bearing, elevation, depression

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AQA topic open book assessments (homework)

Exam question practice in class – 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 last term topics

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Real Life graphs	R	A	G
Plot and interpret linear and quadratic graphs			
Recognise and sketch reciprocal and exponential graphs			
Use graphs to solve simple Kinematic problems including speed, distance and acceleration			
Interpret the gradient of a straight-line graph			

Fractions and Decimals	R	A	G
Order positive and negative integers, use the symbols $=, \neq, <, >, \leq, \geq$			
Apply the four operations, including formal written methods, to positive and negative integers.			
Apply the four operations to fractions			
Apply the four operations to decimals			
Calculate exactly with fractions			
Convert terminating decimals to fractions and vice versa			
Change recurring decimals to fractions and vice versa			

Basic Probability	R	A	G
Use the concepts of prime numbers, factors, prime factorisation, venn diagrams and HCF, LCM.			
Draw and use venn diagrams to calculate probabilities			
Record and analyse probability experiments using tables and frequency trees			
Calculate relative frequencies and recognise bias.			

Understand exhaustive events sum to 1. Recognise mutually exclusive events.			
Construct theoretical possibility spaces for single and combined events with equally likely outcomes.			
Apply systematic listing strategies including using the product rule			

Trigonometry	R	A	G
Use Pythagoras' Theorem in 3D			
Use trigonometry to find missing sides of right-angled triangles			
Use trigonometry to find missing angles of right-angled triangles			
Combine trigonometry and Pythagoras' theorem			

Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
Real life graphs Sketching graphs	Plot and interpret linear and quadratic graphs using a table of values	BIDMAS, negative gradients	Real Life Graphs PP AQA exam advice "small things big difference" on sketching graphs
	Recognise and sketch reciprocal and exponential graphs		Multiple choice match up questions graph and equation
	Use graphs to solve simple Kinematic problems including speed, distance and acceleration		Show me a graph to represent Discussion around when linear or curved Graphing stories

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	Interpret the gradient of a straight-line graph		
Fractions and Decimals	Order positive and negative integers, use the symbols =, ≠, <, >, ≤, ≥. Apply the four operations, including formal written methods, to positive and negative integers.		Check prior knowledge Fractions & Decimals PP
	Apply the four operations to fractions	Calculate exactly with fractions	
	Apply the four operations to decimals	Links to algebraic fractions	
	Convert terminating decimals to fractions and vice versa	Decimals greater than 1, first decimal place not included in repeat	How do you know if a decimal is terminating? (prime factors only 2&5s)
Basic probability	Use the concepts of prime numbers, factors, prime factorisation, venn diagrams and HCF, LCM.		Basic Probability PP Introduce set notation
	Draw and use venn diagrams to calculate probabilities	Algebraic problems. Set notation	
	Record and analyse probability experiments using tables and frequency trees		
	Calculate relative frequencies and recognise bias.	Algebraic problems	
	Understand exhaustive events sum to 1. Recognise mutually exclusive events.		
	Construct theoretical possibility spaces for single and combined events with equally likely outcomes.		
Combinations & Permutations	Apply systematic listing strategies including using the product rule		KMB resource

			Common exam Qs: restaurant choices or padlock codes
Trigonometry	Use Pythagoras' Theorem in 3D	Can students discover $d^2 = a^2 + b^2$ c^2	Check prior knowledge (Year 9 Trig booklet) Trigonometry PP
	Use trigonometry to find missing sides of right-angled triangles	Worded problems	
	Use trigonometry to find missing angles of right-angled triangles	Worded problems	
	Combine trigonometry and Pythagoras' theorem	No diagram given, angle of elevation and depression	Pirate Trigonometry challenge