KESTEVEN AND SLEAFORD HIGH SCHOOL

Mathematics Scheme of Learning
Year 10 – Term 2

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 9 Term 4 grouped data • Year 9 Term 4 scattergraphs • Year 9 Term 3 quadratic sequences • Year 9 Term 5 percentage change and compound interest (HSL) • Year 9 Term 5 area and volume (HSL), Year 10 Term 1 expressions	• GCSE statistical measures, A level statistics • A level sequences and series including further work on geometric sequences finding the nth term • A level exponential modelling problems with percentage multipliers • A level algebraic manipulation, calculus minimum and maximum
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
• Science, Geography and Psychology data collection • Percentages are cross curricular eg profit costing in technology	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	•

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Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?
Know Draw and interpret pie charts, bar charts (F pictograms), time series graphs. Draw and interpret cumulative frequency graphs and box plots. Draw and interpret Histograms. Draw and interpret a scatterdiagram including describing correlation, relationship shown, drawing a line of best fit to estimate. Express one quantity as a percentage of another. Compare quantities using percentages. Calculate percentage change and reverse percentages using multiplier method. Calculate compound and simple interest and other repeat percentage change. Identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres. Identify parts of a circle. Calculate the perimeter of 2D shapes and composites including circles. Know and apply formulae to calculate area of triangles, parallelograms, trapezia, circles and composites. Calculate the surface area of pyramid composites. Calculate the arc length and area of sectors or circles. **Apply** Compare distributions from cumulative frequency graphs and box plots. Find proportion/percentage of population more than/less than a given value from a histogram Explore causation vs correlation and when an estimate is interpolation or extrapolation. Percentage in context problems as above. Shape problems in context

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Extend
No frequency density scale problems. Estimate the median. Explain why an estimate from a scattergraph is not reliable/appropriate. Algebraic repeat percentage problems Working backwards problems – knowing the surface area/volume/perimeter and using to find a missing dimension. Algebraic problems.

What subject specific language will be used and developed in this topic?	**What opportunities are available for assessing the progress of students?**
• Cumulative frequency, distribution, averages, • Correlation, extrapolation, interpolation, relationship, estimate • Generate, nth term, linear, quadratic, arithmetic, sequence, progression, • Compound, simple, interest, profit, depreciate, increase, decrease	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

Collecting and Representing data	R	A	G
Interpret and construct: frequency tables, bar charts, pie charts, pictograms (F), time series graphs			
Construct and interpret cumulative frequency diagrams and box plots			
Compare distributions			
Construct and interpret histograms			

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Scatter Graphs	R	A	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			

Sequences	R	A	G
Generate sequence from a term to term or position to term rule			
Recognise sequences of triangular, square and cube numbers			
Recognise and use fibonacci sequences, quadratic sequences, simple geometric progressions			
Find the nth term for linear and quadratic sequences			

Percentages	R	A	G
Express one quantity as a percentage of another			
Compare two quantities using percentages			
Interpret percentage problems using a multiplier, including percentage increase and decrease			
Solve reverse percentage problems (finding the original amount)			
Calculate simple and compound interest			

Perimeter and area	R	A	G

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Identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres. Identify parts of a circle.			
Calculate the perimeter of a 2D shapes and composites, including circles.			
Know and apply formulae to calculate area of triangles, parallelograms, trapezia, circles and composites.			
Calculate the surface area of pyramid composites.			
Calculate the arc length and area of sectors or circles.			

Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
Collecting and representing data	Interpret and construct: frequency tables, bar charts, pie charts, pictograms (F), time series graphs		Check prior knowledge and misconception of proportion vs population with pie chart problems
	Construct and interpret cumulative frequency diagrams and box plots		
	Compare distributions		1. Comment in context, refer to values, on measure of spread (range or IQR): “more/less consistent” “more/less spread out” 2. Comment in context, refer to values, on median: “on average”
	Construct and interpret histograms	No Frequency density scale	

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Scattergraphs	Draw scattergraphs. Recognise positive and negative correlation. Describe the relationship between the two variables. Draw and use lines of best fit		Check prior knowledge, ensure know different between correlation and relationship. Must draw line of best fit to estimate. Bee problem
	Understand correlation and causation. Interpolate and extrapolate knowing when you should be cautious		Causation vs correlation discussion: http://www.tylervigen.com/spurious-correlations KDU worksheet
Sequences	Generate sequence from a term to term or position to term rule. Find the nth term for a linear sequence.		Check prior knowledge
	Recognise sequences of square numbers and related sequences. Find the nth term for quadratic sequences		a,b,c algebraic method? Table method?
	Recognise sequences of triangular and cube numbers. Recognise and use Fibonacci sequences, simple geometric progressions		
Percentages	Express one quantity as a percentage of another. Compare two quantities using percentages		
	Interpret percentage problems using a multiplier, including percentage increase and decrease. Calculate simple and compound interest and other repeat percentage problems.	Algebraic repeat percentage problems.	
	Solve reverse percentage problems (finding the original amount)		Encourage highlighting of keyword to identify reverse

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			percentage problem Q eg “original amount” “price before”
Perimeter & Area	Identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres. Identify parts of a circle.	Drawing 3D shape on isometric paper	Encourage drawing of net for those struggling.
	Calculate the perimeter of a 2D shapes and composites, including circles.	Algebraic problems	
	Know and apply formulae to calculate area of triangles, parallelograms, trapezia, circles and composites.	Algebraic problems	
	Calculate the surface area of pyramid composites. Work backwards when SA is known.	Algebraic problems	
	Calculate the arc length and area of sectors or circles.	Algebraic problems	