KESTEVEN AND SLEAFORD HIGH SCHOOL

Mathematics Scheme of Learning

Year 7 – Term 4/Coordinates & Graphs/Sequences/Angles

Intent – Rationale

Students in Year 7 are building and securing knowledge from Key Stage 2. The graphical and sequence elements of this unit will provide opportunities for students to develop their problem-solving skills. These include exploring methods to generalise patterns found, and ways to record their findings such as in a table and justifying their answers using angle facts. Students will find enjoyment in going beyond the National curriculum to research the natural occurrence of the Fibonacci sequence.

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
• KS2 Students will be able to plot coordinates in all four quadrants given a set of axes. • KS2 Students will be able to find the next term in an arithmetic sequence and recognise patterns • KS2 Students will know that angles in a triangle sum to 180 degrees, and be able to recognise parallel lines	• In Year 8 term 2, plotting coordinates to draw other graphs such as those of a quadratic and cubic equation. They will begin to make connections between linear equations and their graphs, relating gradient and y intercepts to real life concepts • In Year 8 term ,3 use angle facts to solve problems with composite shapes and give reasonings to justify their workings • In Year 9 term 5, find the nth term of a quadratic sequence
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
Business • Interpretation and use of quantitative data in business contexts to support, inform and justify business decisions, including information from graphs and charts. **Design and Technology** • Translate information between graphical and numeric form- Extracting information from technical specifications. • Use angular measures in degrees - Measurement and marking out, creating tessellated patterns. **Geography** • Graphical skills **Art**	• SMSC(C) - development of angle knowledge and contribution to the world as we know it • GB4d)e)g)I)

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• Geometry in design	
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	**What are the opportunities for developing mathematical skills?**
• The justifications of angle rules (facts) that need to be known, and how these should be written in an exam context (full sentences).	• Identifying any misconceptions around x and y axis and plotting with negative values • Recognise common sequence patterns such as square and cube numbers, explore famous sequences such as Fibonacci and its 'natural' occurrence • Write reasonings to justify their answer when finding angles

Mathematics Scheme of Learning

Year 7 – Term 4

Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?
National Curriculum 2014 Programme of Study Reference: • work with coordinates in all four quadrants • generate terms of a sequence from either a term-to-term or a position-to-term rule, recognise arithmetic sequences and find the nth term, recognise geometric sequences and appreciate other sequences that arise • draw and measure angles in geometric figures, use the standard conventions for labelling the sides and angles of triangle ABC, apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles, understand and use the relationship between parallel lines and alternate and corresponding angles, derive and use the sum of angles in a triangle **Know** Plot values accurately in all 4 quadrants of a graph. Construct a set of axes. Plot straight line graph using a table of values. Explore real life graphs. Identify patterns to find the next term in a sequence, find nth term rule for simple arithmetic sequences. Explore other sequences.

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Use angle notation, accurately draw and measure angles using a protractor. Know angle facts for angles on a straight line, around a point, in triangles (including equilateral and isosceles), quadrilaterals and in parallel lines.

Apply

Begin to recognise the connections between variables in an equation and the graphical representation.
Make generalisations about a sequence to form a rule; the nth term.
Solve problems to find missing angles in parallel lines and triangle problems.

Extend

Make links with shape properties to identify a missing coordinate
Create a numerical sequence to represent a visual pattern e.g. matchsticks
Find missing angles in composite problems and justify workings.

What subject specific language will be used and developed in this topic?	What opportunities are available for assessing the progress of students?
• Quadrant, coordinate, x axis, y axis, linear graph, quadrant, variables, straight line, table of values • Term, term-to-term rule, nth term, linear sequence, arithmetic sequence, Fibonacci, pattern • Parallel, corresponding angles, supplementary angles/co interior angles, alternate angles, sum to, justify	• Check pupils can draw accurate sets of axes, mini whiteboards- coordinate problem solving, create a coordinate picture • Research homework task on Fibonacci in nature • Mini quiz on identifying which angle in parallel lines rule has been used • Summative end of term assessment

Coordinates and Graphs	R	A	G
Read and plot coordinates in all four quadrants			
Plot straight line graphs			
Real Life Graphs			

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Sequences	R	A	G
Find and follow term-to-term rules			
Find missing terms of a sequences			
Find the nth term of a linear sequence			
Other sequences			

Angles	R	A	G
Measure Angles			
Draw Angles			
Calculating angles on straight lines and around a point			
Calculating angles in triangles and Quadrilaterals			
Calculating angles in parallel lines			

Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
Coordinates	Plot values accurately in all 4 quadrants of a graph.	Create shapes within quadrants	KMB Y7 Straight Line Graph PPT Ensure students can accurately draw a set of axes with 4 quadrants. Coordinate pictures EM page 134 coordinates
		Students will be able to make links with shape properties to identify a missing coordinate	T:\Departments\Curriculum\Maths\2019-20\KS3\Year 7\Term 4\Coordinates (1).ppt

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			Only use slide 16 for year 7 problem solving KMB Straight Line Graph Starters
	Plot straight line graphs using a table of values.	Ext Q linking to simultaneous equations – are there any points where more than one egg will be placed?	Easter bunny linear graphs EM page 159-164 straight line graphs
	Explore real life graphs.		P283 make links back to conversions and time from last term. CM page 239
Sequences	Identify patterns to find the next term in a sequence,	Find missing numbers within a sequence, including algebraic	KMB Y7 Sequences PPT EM page 45-50 EM page 315-320
	Find nth term rule for simple arithmetic sequences.	Use the nth term to find any term in a sequence	
	Explore other sequences including Fibonacci and common sequences such as even numbers, square numbers etc.	Students can create a numerical sequence to represent a simple visual pattern e.g. matchsticks	Fibonacci surprises: **http://nrich.maths.org/11164**
Angles	Use angle notation. Accurately draw and measure angles using a protractor.		KMB Y7 Angle PPT Starter, identify angles e.g. <BAC use mini white boards
	Know angle facts for angles around a fixed point and on a straight line.	Proof of angles on straight line and in a triangle. Pupils can solve algebraic problems with missing angles	Angle rocket pictures CJT please link EM page 99 -103 "Starter": Angle proof - tricky
	Angles in triangles and quadrilaterals	Students can find missing angles in composite problems and justify workings	

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		Pupils can solve algebraic problems with missing angles	
	Introduce angles in parallel lines, focus on identifying the Z, F and C shape.	Correct terminology	EM page 104 - 108