KESTEVEN AND SLEAFORD HIGH SCHOOL

Mathematics Scheme of Learning
Year 9 – Term 5/Sequences/Volume and SA/Percentages/Inequalities

Intent – Rationale

Students build on knowledge from Year 8 to use in real life contexts with increased frequency in preparation for GCSE problems where knowledge will need to be combined and applied. Students will explore simple and compound interest with discussion on bank interest rates and personal finances.

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
• Year 8 Term 5 generating simple arithmetic sequences, finding the nth term. • Year 8 Term 6 finding the V and SA of prisms. Term 1 Y9 area and perimeter of compound shapes. • Year 8 Term 3 using multiplies for % change • Year 7/8 place value, Year 9 Term 1 solving linear equations, Year 9 Term 4 drawing straight line graphs.	• GCSE generating linear/quadratic sequence to solve problems. Recognise geometric sequences and find the next term. • At GCSE V and SA of cones, spheres & pyramids. Problems such as using V to find rate of flow. Compound measure problems D/M/V and P/F/A • GCSE repeat % change problems simple vs compound interest • GCSE represent multiple inequalities graphically and identify integers which meet conditions given.
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
Design and Technology • Percentage calculations • Volume and surface area of products Music • Sequences and rhythm, sequences and pattern Science • Calculations with volume and percentages • Use of known/given formulae	• SP2&3, C1 • GB4efghi • SMSC (SO) Work on percentages can lead to a discussion of money lending and rates of interest.

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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 Math Book' - Clifford Pickover • 'Alex's Adventure in Numberland' - Alex Bellows • 'On the Job: First Responders: Expressions, Equations and Inequalities – Vickie An	• Use of tables for systematic working to generate a sequence for a problem • Using real life objects to find SA and V • Best buys using percentage change

Mathematics Scheme of Learning
Year 9 – Term 5

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

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.

Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders). Calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes.

Use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D

work interchangeably with terminating decimals and their corresponding fractions (such as $\frac{7}{2}$ and 3.5 or 0.375 and $\frac{3}{8}$). Define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100%. Interpret fractions and percentages as operators

Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors

Know

Finding the nth term of an arithmetic sequence and a quadratic sequence. Explore other sequences e.g. $n^3 + 1$.

Recap find the area and perimeter of basic shapes. Calculate the volume of prisms including cylinders and compound prisms (not spheres, cones, pyramids). Calculate the surface area of a cylinder.

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<table>
<tr><td colspan="2">Recap using multipliers to calculate percentage change. Reverse percentages with emphasis on language used to identify. Calculate compound interest and repeat percentage change.
Represent an inequality on a number line and graphically. Solve a linear inequality.
<u>Apply</u>
Generate a sequence from a picture.
Solve problems to find missing dimensions when given the volume or surface area.
Personal finances.
Form an inequality to represent a worded problem.
<u>Extend</u>
Form hypothesis and develop further questions to support an investigation where a sequence has been formed to generalise.
Use the volume to solve problems such as in compound measures or rate of flow.
Able to identify opportunities to use percentage change to manage finances.
Identify a region to represent multiple inequalities on a graph.</td></tr>
<tr><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></tr>
<tr><td>Arithmetic, geometric, quadratic, nth term, term-to-term, area, surface area, compound, cross section, prism, circumference, diameter, radius, multiplier, simple interest, compound interest, depreciates, decay, original amount, percentage change</td><td>Investigative problem generating a quadratic sequence
Discussion of changing dimension and effect on SA and V, ‘goalless’ problems
Use of mini whiteboards recapping multipliers. Best buy tasks</td></tr>
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Sequences	R	A	G
Be secure in finding the nth term of any linear sequence			
Identify an arithmetic, geometric, quadratic and fibonacci sequence			
Find the nth term of a quadratic			
Generating sequences from pictures			

Volume & Surface Area	R	A	G
Perimeter, area and volume of basic shapes			
Calculate the volume of Prisms			
Work out the surface area of cylinders			
Work out the volume of a compound Prisms			

Percentages	R	A	G
Use multipliers to calculate a percentage change			
Reverse percentages – find the original amount			
Calculate compound Interest			
Understand Personal Finances			

Inequalities	R	A	G
Represent an inequality on a number line			
Solve linear inequalities			
Represent an inequality graphically			