KESTEVEN AND SLEAFORD HIGH SCHOOL

Mathematics Scheme of Learning

Year 8–Term 1 Number properties/Powers/Expressions&Identities/Area&Perimeter

Intent – Rationale

Year 8 begins ensuring students have a secure understanding of number properties to use throughout topics. Their algebra knowledge is developed from Yr7 basics to ensure accurate language and notation is understood. This knowledge is then used in Area and Perimeter problems once they have recapped formula for basic shapes and introduced new formula.

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
• Year 7 Term 2 number properties • Year 7 Term 6 powers and indices • Term 2 algebra basics • Year 7 Term 3 circles, Term 1 A&P of quadrilaterals	• Year 9 Term 1 factorising expressions, Year 8 Term 5 ratio • Term 1 powers and indices • Year 8 Term 1 A&P algebraic problems, Term 4 solving linear equations, Year 9 Term 1 algebraic expressions
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
Design and Technology • Calculating areas and perimeters for design **Languages** • Solving worded problems • Evaluating the language used in questions **Science** • Indices • Use of known/given formulae	• SP2&3, C1 - The use of symbols to represent numbers, developing the understanding that a letter can represent any number. Draw students' attention to the roots of algebra in the Middle East and India. • SP2&3, C1 - Study of prime numbers as the building block of mathematics can lead to a discussion of the 'mystical' nature of these numbers. Bring in different mathematicians and their careers in time with history. • SP2&3, C1 - An introduction to Pi as an infinite number, link to its use in astronomy. Discussion of the independent discovery of Pi by various cultures and the work carrying on today across the globe investigating this fascinating ratio. • GB4efghi

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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?
• Blockhead: The life of Fibonacci • The Math Book by Clifford Pickover • Alex's Adventure in Numberland By Alex Bellows • Infinity and me.	• Typically, students forget to half their initial answer when finding the area of a triangle, forget to use the perpendicular heights of a parallelogram/triangle and confuse values of "a and b" for parallelograms • Confusion with a x a = a^2 with a+a = 2a

Mathematics Scheme of Learning
Year 8 – Term 1

Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?
Know Know first 15 square numbers and roots. Know the first 5 cube numbers and roots. Definition of a prime number. Find the LCM and HCF using lists and prime factorisation, and find HCF and LCM through either pairs or Venn diagram method. Express number in index notation. Multiply and divide in index notation. Simplify expressions using index laws and collecting like terms. Expand single brackets with numerical coefficients or letter. Able to differentiate between an identify, expression, equation or formula. Substitute in to an expression and formula-positive and negative values? Recap calculating the area of rectangles from Y7. Recap calculating the area of triangles from KS2. Use the formula for the area of a parallelogram and trapezium. Calculate the area of compound shapes (including rectangles, parallelograms, trapeziums and triangles). **Apply** Worded problems using LCM and HCF e.g. how many burgers can be made from x buns and y burgers? Form expressions and equations in simplest form Substitute in to formula or expressions with context-positive and negative values? Decimals and fractions? Algebraic representations of perimeter and area (one variable only)

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Extend Worded LCM HCF problems Coefficients and multiple variables used in multiply and divide problems Expanding brackets with letter and number coefficients Finding side lengths when given the area	
What subject specific language will be used and developed in this topic?	**What opportunities are available for assessing the progress of students?**
• Multiply, divide, integer, prime, index, indices, powers, cube, square, root, LCM, HCF, factorise/factorisation, Venn, simplify, expression, identity, equation, 'like terms', coefficient, substitute, formula, simplest/simplify, variable, expand, compound, rectangle, triangle, parallelogram, trapezium, parallel, quadrilateral, area, perimeter	• Quick Fire quizzes on squares/roots/cubes/cube roots • Use of mini whiteboards for forming algebraic expressions • Mid-term target questions • End of half term assessment

Number Properties	R	A	G
Know Prime numbers, square numbers, square roots and cube roots			
Find factors and multiples			
Solve worded problems finding LCM or HCF			
Be able to do Prime factor decomposition and use to find HCF LCM			

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Powers and Indices	R	A	G
Write a number in index notation			
Multiply and divide in index notation			

Expressions and Substitution	R	A	G
Able to simplify expressions			
Expand expressions with a single bracket			
Identify an expression, equation, formula			
Form an expression and equation			
Substitute in to an expression and formula			

Area and perimeter	R	A	G
Calculate the area of quadrilaterals, triangles, and compound shapes			
Calculate the area of a parallelogram and trapezium			
Solve mixed area and perimeter problems including algebraic representation			
Find missing side lengths of given areas			