KESTEVEN AND SLEAFORD HIGH SCHOOL

Mathematics Scheme of Learning
Year 9 – Term 1/Expanding&Factorising/Solving Equations/A&P

Intent – Rationale

Year 9 is the finale of KS3, where students must have secured knowledge up to Foundation GCSE to be prepared for Higher GCSE studies. Underpinning much of GCSE mathematics is algebraic methods so this begins term 1.

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
- Year 7 Term 1 symmetry, KS2 transformations, - Year 8 Term 1 expressions & identities - Year 8 Term 4 forming and solving linear equations - Year 8 Term 2 drawing quadratics - Year 8 Term 6 volume (HSL) - Year 9 Term 1 expanding & factorising - Year 9 Term 1 algebra	- Year 9 Term 1 solving equations, A&P substituting into formulae and algebraic problems - Year 9 Term 3 changing the subject - Year 9 Term 4 construction triangles - Year 9 Term 5 volume - GCSE transformations
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
Art Transformation/tessellation of shapes (Escher) **Design and Technology**	SP2&3, C1 - The use of symbols to represent numbers, developing the understanding that a letter can represent any

Calculating areas and perimeters for design
 	
Construction and transformations strands of shape, space and measures
 	
    • **Languages**
 	
Solving worded problems
 	
Evaluating the language used in questions
 	
    • **Science**
 	
Indices
 	
Use of known/given formulae
	number. Draw students' attention to the roots of algebra in the Middle East and India.
	
	• 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

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	• Ensure a clear understanding of algebraic manipulation and understanding of command words such as solve, expand, simplify. • Development of spacial awareness, including reflecting and rotating objects.

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<u>Year 9 – Term 1</u>

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Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?

National Curriculum reference

Use and interpret algebraic notation, including: ab in place of a × b,3y in place of y + y+ y and 3 × y, a^2 in place of a × a, a^3 in place of a × a × a;

a^2b in place of a × a × b

$\frac{a}{b}$ in place of a ÷b

Coefficients written as fractions rather than as decimals

Brackets: simplify and manipulate algebraic expressions to maintain equivalence by: collecting like terms, multiplying a single term over a bracket , taking out common factors. Model situations or procedures by translating them into algebraic expression or formulae and by using graphs. Use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement).

Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, calculate and solve problems involving: perimeters of 2-D shapes and composite shapes.

Know

Identify an expression, equation, formula and identity. Factorise by common factors in to a single bracket. Expand single and double brackets (using grid or FOIL). Factorise quadratic equations with coefficients of x^2.

Solve linear equations with brackets, fractions and unknowns on both sides.

Solve quadratic equations by factorising.

Know and use the formulae for area and perimeter of simple shapes including circles. Calculate the area and perimeter of compound shapes.

Apply

Form and solve linear and quadratic equations from a worded problem.

Link quadratic solutions with graphical form.

Use algebraic methods to solve area and perimeter problems.

Area and perimeter problems in context.

Extend

Solve simple algebraic fraction equations.

Solve quadratic equations with coefficient of x^2

Compound algebraic shape problems.

What subject specific language will be used and developed in this topic?	What opportunities are available for assessing the progress of students?
Expression, identity, equation, formula, formulae, term, coefficient, expand, solve, factorise, simplify, collect like terms, linear, quadratic. Area, perimeter, compound, simplest form,	• Half term unit test • Mid Term marking targets • Mini whiteboards • Catchphrase Misconceptions: • Solving linear equations with fractions, errors occur when solving of the form $2 + x/3 = 7$ when students want to multiply by 3 first and forget would have to multiply the 2 by 3 too. • Factorising single brackets in a calculation eg $2(x+1) + 7(x-3)$ wanting to use FOIL as they see two brackets

Expanding and Factorising	R	A	G
Be able to factorise by common factors in to a single bracket			
Expand expressions with single brackets			
Expand expressions with double brackets			
Know how to factorise quadratic expressions into two brackets			

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Equations	R	A	G
Solve linear equations, including those with brackets and fractions			
Know how to solve quadratic equations by factorising			
Form and solve equations from a written problem			

Area and Perimeter	R	A	G
Find the area and perimeter of simple shapes			
Find the area and perimeter of compound shapes			
Solve using algebraic methods area and perimeter problems			