KESTEVEN AND SLEAFORD HIGH SCHOOL

Mathematics Scheme of Learning
Year 7 – Term 2/Algebraic expressions/Number properties/Fraction basics/Probability/Maths in the World

Intent – Rationale

The introduction of algebra basics allows concepts to be generalised. This term is a continuation of ensuring all students have a strong foundation of key concepts including number properties and probability.

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
• KS2 many students are familiar with '?' or boxes to fill in missing numbers as a bridge to algebra. • KS2 multiplication tables and understanding of division links to factors. Many know prime numbers. • KS2 many are secure in their adding and subtracting of proper fractions • KS2 many are familiar with the language used to describe chance on the probability scale • KS2 many are familiar with calculating with money	• Year 7 Term 1 place value • Year 7 Term 2 probability • Year 7 Term 3 balance equations • Year 7 Term 5 simple % increase/decrease • Year 7 Term 5 comparing data • Year 8 Term 3 comparing sets of data • Year 8 Term 6 probability • Year 9 Term 4 comparing sets of data • Year 9 Term 5 personal finances • All maths!
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
Languages • Language patterns in counting numbers Music • Rhythm and counting	• GB4ef

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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?
• 'Alex's Adventure in Numberland' - Alex Bellows • 'The Math Book' - Clifford Pickover	• Ensuring secure understanding of adding terms and multiplying terms • Introduction to using a budget and estimating the costs of items, identifying flaws in collecting data

Mathematics Scheme of Learning
Year 7 – Term 2

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, ab in place of a÷b, coefficients written as fractions rather than as decimals , substitute numerical values into formulae and expressions, including scientific formulae, understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors, simplify and manipulate algebraic expressions to maintain equivalence by collecting like terms Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property, use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative, use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5and 7/2 or 0.375and 3/8) Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale, understand that the probabilities of all possible outcomes sum to 1 Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics

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<table>
<tr><td colspan="2"><u>Know</u>
Basic algebraic manipulation, collect like terms. Substitute in to an expression and formula.
Express fractions in their simplest form and find equivalent fractions. Written methods for the four operations with proper fractions. Convert between mixed numbers and improper fractions.
Know and use the probability scale with words/decimals/fractions. Calculate the theoretical probability of single events and simple combined independent events. Explore experimental probability.
<u>Apply</u>
Form and use a formula
Fraction calculation word problems
Probability problems in context
<u>Extend</u>
BIDMAS use in substituting in to formula
Adding/subtracting improper fractions/mixed numbers
Identify differences between experimental and theoretical probability.</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>Term, expression, collect like terms, simplify, substitute, power.
Multiple, factor, prime, square, root, cube, integer
Fraction, proper fraction, improper fraction, mixed number, cancel, equivalent, simplify, simplest form, numerator, denominator, multiply, divide, add, subtract, common denominator
Probability, chance, likelihood, certain, impossible, even chance, equally likely, mutually exclusive, event, trial, outcome, theoretical, experimental, systematic list, scale, fraction, decimal, percentage, ratio
Money, coins, pounds, pence, cost, finance, data collection</td><td>• End of term unit assessment
• Mid Term marking targets
• Common misconceptions:
• Students often mistake adding and multiplying with 2a and a^2
• Students forget that only letters raised to the same power can be added
• Students confuse that letters can be written next to each other if multiplied but cannot be added together to write next to each other when collecting like terms
• Students confuse when a common denominator is needed
• Students forget they can cancel before multiplying
• Students can forget to multiply numerator when finding a common denominator to find an equivalent fraction</td></tr>
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	• Students confuse multiples and factors • 2 is the only even prime number, 1 is not a prime number as it does not have exactly 2 factors • Students confuse equally likely with equal chance • Confusion over when equal chance and two outcomes which are not equally likely e.g. bias coin or P(A) and P(not A)

Algebraic expressions	R	A	G
Use letters to represent numbers			
Collect like terms and multiply terms			
Substitute to find the value of an expression			
Substitute values in to a formula			
Form an expression and a formula			

Number properties	R	A	G
Identify the factors of a number			
Identify multiples of a number			
Recognise square numbers 1-15			
Recognise cube numbers 1-5			
Recognise prime numbers			
Find HCF and LCM using a list			
To be able to use prime factorisation to write a number as its product of primes			

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Fractions	R	A	G
Find equivalent fractions			
Write a fraction in its simplest form			
Add and subtract fractions, finding simple common denominators			
Multiply fractions			
Divide fractions			
Convert between improper fractions and mixed numbers			

Probability	R	A	G
Know the probability scale in word and different number forms.			
Calculate the probability of combined events			
Explore experimental probability			

Maths in the world	R	A	G
Calculate costs			
Compare costs to make financial decisions			
Identify issues in collecting data			

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Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
Algebraic expressions	Use letters to represent numbers		Y7 Algebraic Expressions notebook
	Collect like terms and multiply terms	'Extension 7' – Algebra A3.1 activities	
	Substitute to find the value of an expression	Substitute decimals and fractions	
	Substitute values in to a formula		
	Form an expression and a formula	'Extension 7' – Algebra A3.1 activities 'Extension 7' – Algebra A5.1 activities 'Problem Solved! Book 1' Pg33-35	
Fractions	Find equivalent fractions	Link back to algebra work basic algebraic equivalent fractions	Y7 Fractions notebook Starter: Equivalent fractions – fascinating!
	Write a fraction in its simplest form Convert between improper fractions and mixed numbers	Ordering improper fractions and mixed numbers	'The National Curriculum…and beyond' Star Challenge Fraction Searches pg131 'Extension 7' – Number N2.3 activities
	Add and subtract fractions, finding simple common denominators	Mixed numbers	

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	Multiply fractions	'The National Curriculum…and beyond' Fractions of fractions activity pg158 'Extension 7' – Number N5.1 activities	Cancelling first
	Divide fractions		Masterminder or starter: Substitution and optional simplification.
Probability	Know the probability scale in word and different number forms.		Y7 Probability notebook 'Extension 7' – Statistics S1.3 activities
	Calculate the probability of combined events	'Problem Solved! Book 1' Chapter 9	'Extension 7' – Statistics S1.3 activities
	Explore experimental probability	Know the difference between experimental and theoretical probability – uses?	'Extension 7' – Statistics S2.2 activities
Maths in the World	Calculate costs	'Problem Solved! Book 1'Chapter 1	Y7 Maths in the World notebook 'The National Curriculum…and beyond' Money matters pg147
	Compare costs to make financial decisions	Compare budgets in different currencies	
	Identify issues in collecting data		'The National Curriculum…and beyond' Collecting your own information pg174