Year 7 Scheme of Work

Unit	Key Objectives
Transition	Students will tackle a range of problems to introduce them to mathematical thinking and problem solving
Understanding Number	***Place Value:*** Understand and use various representations of place value Write large numbers in words, including tens of millions and vice versa Multiply a positive integer and decimals by a power of 10 Divide a positive integer and decimal by a power of 10 ***Powers, Roots, Negatives and Order of Operations:*** Read, write and evaluate powers Recognise and use square numbers Define and find square roots (including using the square root symbol) Define and find cube roots and fourth roots etc, including the use of a scientific calculator Add and subtract over the number line crossing Apply the order of operations to multi-step calculations involving up to four operations and brackets
Algebraic Proficiency	Know the meaning of expression, term, formula, equation, function Know and use basic algebraic notation (the 'rules' of algebra) Understand how to form basic expression algebraically Simplify a simple expression by collecting like terms Simplify expressions involving multiplication Manipulate expressions by multiplying an integer over a bracket (the distributive law) Manipulate expressions by multiplying a single term over a bracket (the distributive law) Expanding two single brackets and collecting terms e.g. 5(x + 3) + 2(x + 8) Substitute positive numbers into expressions and formulae

Decimals	Add decimals with the same, and different, number of decimal places
	Subtract decimals with the same, and different, number of decimal places
	Transform a multiplication involving decimals to a corresponding multiplication with integers
	Multiply a large integer up to four-digits by a decimal of up to 2dp using integer multiplication
	Use a formal method to divide a decimal by an integer < 10
	Transform a calculation involving the division of decimals to an equivalent division involving integers
	Round a number to a specified number of decimal places
	Round a number to one significant figure
	Estimate calculations by rounding numbers to one significant figure
	Understand that division by 0.5, 0.1 and 0.2 is equivalent to multiplying by 2, 10 and 5 and use this in estimation
Numbers in the Number System	Understand the difference between prime and composite number
	Find prime numbers and test numbers to see if they are prime
	Write numbers as a product of prime factors
	Find common factors of numbers
	Find the highest common factor of numbers in simple cases, including co-prime examples
	Find common multiples of numbers
	Recognise and solve problems involving the lowest common multiple
Visualising and Constructing	Understand and use labelling notation for lengths and angles
	Use ruler and protractor to construct triangles, and other shapes, from written descriptions
	Use ruler and compasses to construct triangles when all three sides are known
Solving Equations	Solve one-step equations when the solution is a positive integer or fraction
	Solve two-step equations when the solution is a positive integer or fraction
	Solve three-step equations when the solution is a positive integer or fraction
	Solve multi-step equations including the use of brackets when the solution is a positive integer or fraction
	Solve equations when the solution is an integer or fraction
	ALL SOLVING UNKNOWN ON ONE SIDE OF THE EQUATION

Properties of Shape and Angles	Know the connection between faces, edges and vertices in 3D shapes Recognise and use nets of 3D shapes Know and solve problems using the properties and definitions of triangles Know the properties and definitions of special types of quadrilaterals (including diagonals) Sketching shapes using correct terminology and notation (e.g. include hatch marks, parallel lines etc) Recognise and solve problems using vertically opposite angles Recognise and solve problems using angles at a point Recognise and solve problems using angles at a point on a line
Calculating Percentages	Find basic percentages 50%, 25%, 10%, and 1% Find a given percentage using a non-calculator method (build up method) increase and decrease by a given percentages Apply percentage increase and decrease in real life situations Know that percentage change is equal to the difference as a percentage of the original Calculate the percentage change in a given situation, including percentage increase / decrease
Proportional Reasoning	Describe a comparison of measurements or objects using ratio notation a:b Simplify a ratio by cancelling common factors Simplify ratio where units are not consistent Divide a quantity in two parts in a given part: part ratio Use proportion to answer recipe questions
Probability	Know and use the vocabulary of probability Understand the use of the 0-1 scale to measure probability Use fractions, decimals and percentages to give probabilities List all the outcomes for an experiment, including the use of tables Work out theoretical probabilities for events with equally likely outcomes Know that the sum of probabilities for all mutually exclusive outcomes is 1 Apply the fact that the sum of probabilities for all outcomes is 1 to find the probability of an event not happening

Measuring Data	Find the mode of set of data Find the median of a set of data including when there are an even number of numbers in the data set Calculate the mean from a set of data Calculate and understand the range as a measure of spread (or consistency) Analyse and compare sets of data, appreciating the limitations of different statistics (mean, median, mode, range)
Measuring Space	Choose appropriate units for a particular situation Understand that some units are metric, and some are imperial. Convert fluently between metric units of length Convert fluently between metric units of mass Convert fluently between metric units of volume / capacity Understand and use analogue time
Calculating Fractions	Add proper and improper fractions Subtract proper and improper fractions Multiply proper and improper fractions Multiply (Fraction of amount) Divide a proper fraction by a proper fraction Divide improper fractions
Calculating Space	Calculate perimeters of 2D shapes Use and apply the formula to calculate the area of trapezia Find the missing length in a triangle/rectangle given the area. Find the area of compound shapes Find the surface area of cuboids (including cubes) Use and apply the formula to calculate the volume of cuboids Use and apply the formula to calculate the volume of cuboids

Coordinates	Understand how a pair of coordinates links to x and y values Solve geometrical problems on coordinate axes Write the equation of a line parallel to the x-axis or the y-axis Identify and draw the lines y = x and y = -x Plot a simple graph given a completed table of values including linear, quadratic, cubic etc
Exploring FDP	Order fractions with the same denominator or denominators are a multiple of each other Order fractions with the same numerator Order fractions where the denominators different. Order mixed numbers and fractions Convert between percentages and fractions where the denominator is a factor of 100 (or can be scaled to 100) Convert between fractions, decimals and percentages Write a quantity as a percentage of another
Mathematical Movement	Construct reflections in horizontal, vertical and diagonal mirror lines Describe a reflection in horizontal, vertical and diagonal mirror lines Complete a translation described by a 2D vector Describe a translation as a 2D vector Construct rotations using a given angle, direction and centre of rotation Describe a rotation by finding the centre, direction and angle of rotation
Presentation of Data	Understand and know the terms for different types of data Construct and interpret comparative and composite bar charts Construct and interpret pictograms and know their appropriate use Construct and interpret pie charts and know their appropriate use Construct and interpret vertical line charts