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	***Calculator Skills*** To introduce students to a scientific calculator Use key functions including fractions, mixed numbers. indices, roots, SD button ***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 0; 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 expressions algebraically; Simplify a simple expression by collecting like terms; Simplify expressions involving multiplication; Simplify expressions involving division; 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 2 decimal places using integer multiplication; Use a formal method to divide a decimal by an integer less than 10; Transform a calculation involving the division of decimals to an equivalent division involving integers; Use approximation to check the validity of answers; Calculate with decimals in the context of (e.g.) money; 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 that a multiplication or division ban be broken down into smaller steps e.g. x10 is equivalent to x2 then x5; Understand the difference between prime and composite number (see definition of prime in misconceptions box); 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;
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, including simple interest;

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
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;
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; Find equivalent ratios; Simplify to the form 1:n and n:1; Divide a quantity in a two part ratio; Understand the link between ratio and fractions; 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; 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
Calculating Fractions	Convert mixed numbers and improper fractions
	Add proper and improper fractions
	Subtract proper and improper fractions
	Multiply proper and improper fractions
	Multiply a fraction and an integer
	Divide a proper fraction by a proper fraction
	Divide improper fractions
	Note: Calculations with mixed numbers follows in Year 8, but conversion is included here
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, mass and volume/capacity;
	Understand and use analogue time;
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
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