Year 7 Maths

1. Measures and Number	Understand and use formal methods for adding and subtracting, including with decimals. Understand the concept of inverse operations. Fluent in ordering and adding and subtracting with negative numbers; understand negative numbers in context. Knowledge of the appropriate units for different measures and able to work confidently with different standard measures. Convert between metric units of length, mass and capacity.	Fluent in addition and subtraction methods and able to select the most efficient formal or informal method for a given calculation. Able to use inverse operations in calculations. Order and compare negative and positive numbers using inequality notation; adding and subtracting with negative numbers including with intervals across zero; understand and use negative numbers in context. Knowledge of the appropriate units for different measures and able to work confidently with different standard measures, including converting between them and use them in problem solving.	Fluent in addition and subtraction methods and able to select efficient methods to solve worded or complex problems. Deep understanding of relationships between operations and able to use given calculations to find answers to related problems. Solve problems involving adding and subtracting with negative numbers, including in context. Be able to explain the effects of various operations with negatives. Knowledge of the appropriate units for different measures and able to work confidently with different standard measures, including converting between them and use them in problem solving.
2. Fractions and Ratio	Understand fractions as quantities and as operations; recognise fractions in various representations; manipulate fractions using principles of equivalence; add and subtract fractions. Understand and use ratio notation and conventions. Simplify simple fractions. Understand the difference between ratio and fractions	Use fractions as quantities and as operations to solve problems; use various representations to explain equivalence and to manipulate fractions; compare and add and subtract with fractions. Understand and use ratio notation and conventions. Understand the difference between ratio and fractions and fluently convert between them. Simplify ratios including where the units are different.	Solve problems in various contexts using fractions as both quantities and as operators; be able to explain and apply principles of equivalence; understand efficient methods for comparing and adding and subtracting with fractions. Understand and use ratio notation and conventions. Understand the multiplicative relationship between quantities and be able to convert between them fluently in problem solving. Simplify ratios including those with decimals and fractions.

3. Number	Understand and use formal methods for multiplying and dividing, including with decimals. Understand the concept of inverse operations. Know and be able to evaluate multi-step calculations, including indices, using the correct order of operations; fluent in the concepts and vocabulary of primes, multiples, factors, squares, roots, etc.	Fluent in multiplying and dividing methods and able to select the most efficient formal or informal method for a given calculation. Able to use inverse operations in calculations. Understand and apply the correct order of operations; recognise and calculate integer powers; use concepts of primes, factors, multiples, powers, roots, to solve problems.	Fluent in multiplying and dividing methods and able to select efficient methods to solve worded or complex problems. Deep understanding of relationships between operations and able to use given calculations to find answers to related problems. Solve problems involving order of operations; use knowledge of powers and roots to estimate non-integer roots; solve problems involving primes, factors, multiples, powers and roots.
4. Charts, Graphs and Averages	Able to identify, construct and interpret a range of different statistical representations (including bar and vertical line charts and pie charts) and understand which representations are most suitable for different types of data. Calculate statistical measures of central tendency and spread, and interpret them in context (mean, mode, median and range). Use scatter graphs to identify relationships in bivariate data.	Able to identify, construct and interpret a range of different statistical representations (including bar and vertical line charts and pie charts) and understand which representations are most suitable for different types of data. Calculate statistical measures of central tendency and spread, and interpret/compare them in context, including for continuous and grouped data (mean, mode, median and range). Use scatter graphs to identify relationships in bivariate data.	Able to identify, construct and interpret a range of different statistical representations (including bar and vertical line charts and pie charts) and understand which representations are most suitable for different types of data. Calculate statistical measures of central tendency and spread, and interpret/compare them in context, including for continuous and grouped data (mean, mode, median and range). Use scatter graphs to identify relationships in bivariate data. Analyse and compare data fluently using the appropriate average.
5. Perimeter, Area and Surface Area	Able to calculate the area and perimeter of a number of mathematical shapes and confident in use of correct units. Know and understand the properties of 3D shapes. Calculate surface area of cuboids and work confidently with the units of area.	Fluent in calculating area and perimeter of different mathematical shapes including composites, and able to solve problems of area and perimeter in different contexts. Confident in use of correct units. Know and understand the properties of 3D shapes and use them to solve problems in 3D. Use formulae to calculate the surface area of 3D shapes in different contexts and work confidently with the units of area.	Fluent in calculating area and perimeter of different mathematical shapes including composites, in a variety of different methods and to use those to derive and explain the area formulae. Able to solve problems of area and perimeter in different contexts. Confident in use of correct units. Know and understand the properties of 3D shapes and use them to solve problems in 3D. Derive and apply formulae to calculate the surface area of 3D shapes in different contexts and work confidently with the units of area.

6. Algebra: Manipulation, Equations and Sequences	Know and use formal algebraic language and notation accurately and confidently; fluent in basic manipulation techniques including simplifying and substitution. Able to use inverse operations to solve equations and understand the principle of balancing an equation. Understand and identify the patterns in various sequences, including nonnumerical sequences. Recognise arithmetic sequences and find the nth term.	Use and interpret formal algebraic language and notation accurately and confidently; fluent in basic manipulation techniques including simplifying and substitution, including in a context. Able to use inverse operations to solve equations and set out solutions in a formal way. Explain the principle of balancing an equation and use different representations to illustrate this in practice. Understand and identify the patterns in various sequences, including nonnumerical sequences. Find the nth term of an arithmetic sequence and use it to generate and identify terms.	Able to interpret worded scenarios algebraically to form expressions and to use algebra to model a given worded context. Fluent in algebraic manipulation and able to apply those skills to solve problems. Understand and use formal and informal methods to solve equations; identify the most efficient methods for solving equations. Use the principle of balancing to form and solve equations from given scenarios. Be able to identify patterns in a variety of contexts, and use principles of sequences to solve problems. Find the nth term of an arithmetic sequence and use it to generate and identify terms.