Year 8 Scheme of Work

Unit	Key Objectives
Calculating with Negative Numbers	Subtract a positive number from a negative number; Add a negative number; Subtract a negative number; Multiply a positive number by a negative number; Multiply a negative number by a negative number; Divide a positive number by a negative number; Divide a negative number by a negative number; Square and cube positive and negative numbers;
Algebraic Proficiency: Tinkering	***Substitution*** Substitute positive and negative numbers into formulae ***Laws of Indices*** Simplify expressions using the law of indices for multiplication Simplify expressions using the law of indices for division Simplify expressions using the law of indices for powers Know and use the zero index ***Expand and Factorise*** Factorise an algebraic expression by taking out common factors Expand and simplify expressions of the form $(x\pm a)(x\pm b)$ Expand and simplify expressions of the form $(x\pm a)^2$ Expand and simplify expressions of the form $(ax\pm b)(cx\pm d)$ Expand and simplify triple brackets
Investigating Angles	Solve missing angle problems involving alternate angles; Solve missing angle problems involving corresponding angles; Use knowledge of alternate and corresponding angles to calculate missing angles in geometrical diagrams; Solve missing angle problems involving co-interior angles; Establish the fact that angles in a triangle must total 180°;

Numbers in the Number System: Standard Form	Round numbers to a given number of significant figures Use standard form to write large numbers Use standard form to write small numbers Order numbers in standard form
Calculating Space: Circles	Know circle definitions and properties, including centre, radius, chord, diameter, circumference, arc, sector, segment; Discover pi; Calculate the circumference of a circle when radius or diameter is given; Calculate the perimeter of composite shapes that include sections of a circle; Calculate the area of a circle when radius or diameter is given; Given the area or circumference, find the radius/diameter;
Solving Equations	Solve linear equations with the unknown on one side when calculating with negative numbers is required Solve linear equations with the unknown on both sides when the solution is a whole number Solve linear equations with the unknown on both sides when the solution is a fraction Solve linear equations with the unknown on both sides when the solution is a negative number Solve linear equations with the unknown on both sides when the equation involves brackets Forming expressions from worded questions and in contexts, such as perimeter
Visualising and Constructing: Scales and Bearings	***Scale Diagrams*** Use scale diagrams, including maps; Use the concept of scaling in diagrams; Using maps scales to convert between distances on a map and distances in real life; ***Bearings*** Understand the concept of a bearing Measure and draw bearings Use the co-interior property of angles to solve bearings problems

Proportional Reasoning	Understand and use proportion/ratio tables; Find a relevant multiplier in a situation involving proportion; Express the division of a quantity into two parts as a ratio; Share a quantity into a three-part ratio; Use ratio to find one quantity when the other is known; Use ratio to find quantities when the difference is known; Combine two two-part ratios into a single three-part ratio;
Calculating Space: Volume	Calculate the volume of a right prism; Calculate the volume of a cylinder;
Calculating Percentages	Use a calculator to find percentages of an amount with a multiplier; Use a calculator to increase or decrease by a given percentage using a multiplier; Identify and use the multiplier for a percentage increase or decrease when the percentage is greater than 100%; Calculate the percentage change in an amount; Solve problems involving percentage change, including profit and loss
Visualising and Constructing	***Enlargement*** Use the centre and scale factor to carry out an enlargement with a positive integer scale factor Find the centre of enlargement Find the scale factor of an enlargement ***Plans and Elevations*** Understand and draw the plans and elevations of a 3D shapes
Calculating Fractions	Find a fraction of amount Given a fraction of a number, work backwards to find the whole fraction Add/ subtract mixed numbers Multiply a mixed number by a proper fraction/mixed Divide a mixed number by a proper fraction/mixed number Order of operations problems with fractions Use a calculator for mixed number calculations

Understanding Gradient	Understand the concept of gradient as a measure of steepness and a rate of change; Know when a gradient is positive or negative; Be able to calculate the gradient of straight line using a unitary method or by drawing a triangle using (change in y)/(change in x); Find gradients that are negative and/or fractional; Calculate gradients when scales are not unitary;
Inequalities	Find the set of integers that are solutions to an inequality Know how to represent an inequality on a number line Solve a simple linear inequality in one variable with unknowns on one side Solve a complex linear inequality in one variable with unknowns on one side Solve an inequality in one variable with unknowns on both sides
Exploring FDP	Identify if a fraction is terminating or recurring Write a terminating decimal as a fraction Write a fraction in its lowest terms by cancelling common factors Use a calculator to change any fraction to a decimal
Sequences	Generate terms of a sequence from a position-to-term rule; Use the nth term to find specific terms in a sequence.; Find the nth term of an ascending linear sequence; Find the nth term of and descending linear sequence; Find the nth term of pattern sequences;
Algebraic Proficiency: Visualising	Complete a table of values using patterns (link to sequences) and substitution; Appreciate the link between a table of values and linear sequences; Plot graphs of functions of the form $y = mx \pm c$ using a table of values Plot graphs of quadratic functions of the form $y = x^2 \pm c$ Spot patterns linked to m and c (y=mx+c not explicitly taught here)

Measuring Data	Find the mode, median, mean and range from a frequency table Find the modal class of set of grouped data Find the class containing the median of a set of data Calculate an estimate of the mean from a grouped frequency table Estimate the range from a grouped frequency table
Presentation of Data	Plot a scatter diagram of bivariate data Interpret a scatter diagram using understanding of correlation Use a line of best fit to make predictions Represent data using a stem and leaf diagram Interpret data on a stem and leaf diagram using averages Draw frequency polygons Draw pie charts where multiplier is not a whole number
Understanding Risk	List outcomes of an event systematically Construct a sample space diagram for combined experiments with equally likely outcomes Calculate probabilities using a sample space Use theoretical probability to calculate expected outcomes Use experimental probability to calculate expected outcomes Know the difference between P(A or B) and P(A and B) Calculate the probability of two mutually exclusive events (or rule) Calculate the probability of independent combined events (and rule)
Real Life Graphs	Plot and interpret distance-time graphs; Describe in words what is happening on a distance time graph; Plot and interpret speed-time graphs (velocity-time graphs) Describe in words what is happening on a speed-time graph. Draw and interpret time series graphs Draw straight line graphs for real-life situations, including filling containers, fuel bills, fixed charges (e.g. plumber, taxi) and cost per unit;