Sir William Ramsay School

EMPOWERING EVERYONE TO ACHIEVE

Curriculum Map for Maths Year 8

YEAR 8	Autumn 1	Autumn 2
Topics	**Number** **Area & Volume**	**Statistics - Graphs & Charts** **Expressions & Equations**
Substantive Knowledge – The Knowledge Taught By The Teacher	• Knowledge of integers using operators and decimals. • Knowing that integers are whole numbers positive and negative including zero. Integers can then be broken down to make decimals using operators such as division. • Students will learn about numerical estimation. • Students will learn formulae to find the area and volume of various shapes.	• Students will learn about statistical charts and graphs. • Students will learn how to calculate the mean from frequency tables. • Students will learn about algebraic powers, expressions, brackets, factorising and solving equations.
Disciplinary Knowledge – Concepts, Investigations, Conjecture, Proof, Problem Modelling and Problem Solving	• Understand that accuracy is important in calculations and how errors can build within a problem. • Solving problems where calculating areas/volumes is part of the solution. • Understand which formula links to which shape.	• Understand which statistical chart or graph is the best representation for the data. • Solve statistical problems in a context. • Understand that solving algebra can be more than one step.
Skills	• Recognise and use relationships between operations, including inverse operations (e.g. cancellation to simplify calculations and expressions); use conventional notation for priority of operations, including brackets, powers, roots and reciprocals. • Know and apply formulae to calculate:- area of triangles, parallelograms, trapezia; volume of cuboids and other right prisms (including cylinders).	• Building on interpreting and constructing tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data, vertical line charts for ungrouped discrete numerical data, tables and line graphs for time series data and know their appropriate use.
Links To Prior Learning	• Further developing use of algebra from Year 7 to help calculate area and volume. • Understand volume and capacity and being able to calculate volume of cubes and cuboids.	• Extend knowledge of function machines, collecting like terms, simplifying expressions and writing formulae from Year 7. • Build on algebra in Year 7 including substitution, powers, solving equations and factorising.
Literacy/ Numeracy	• Language of estimation, operators, area and volume.	• Language of statistical graphs and tables, averages, algebraic expressions and linear equations.

	• Extension of deconstructing a written question into mathematical form from Year 7 to more complex problems.	• Extension of deconstructing a written question into mathematical form from Year 7 to more complex problems.
Cross Curricular	• Any areas which use numerical estimation, areas or volumes. • Link to real life contexts.	• Any areas which use statistical graphs, tables or algebra. • Link to algebra to real life situations.
Assessment	• Learning checks throughout with low stakes questioning and starters. • Summative assessment at the end of topic.	• Learning checks throughout with low stakes questioning and starters. • Summative assessment at the end of topic.

YEAR 8	**Spring 1**	**Spring 2**
Topics	**Real Life Graphs** **Decimals & Ratio**	**Lines & Angles**
Substantive Knowledge – The Knowledge Taught By The Teacher	• Students will learn about distance-time graphs and how to interpret them. • Students will learn about degrees of accuracy when using and calculating with decimals. • Students will learn how to split quantities using ratios.	• Students will learn about angle properties on a straight line, about a point, in polygons and with parallel lines.
Disciplinary Knowledge – Concepts, Investigations, Conjecture, Proof, Problem Modelling and Problem Solving	• Understand graphs have various purposes and can be linked to real life scenarios. • Understand graphs can display data more effectively to help recognise trends.	• Understand the rules for angles and their proofs. • Understand the concept of parallel lines and how it links to angles.
Skills	• Identify and interpret gradients and intercepts of linear functions graphically and algebraically. • Round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures). • Divide a given quantity into two parts in a given part:part or part:whole ratio; express the division of a quantity into two parts as a ratio; apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing, concentrations).	• Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles; understand and use alternate and corresponding angles on parallel lines; derive and use the sum of angles in a triangle (e.g. to deduce and use the angle sum in any polygon, and to derive properties of regular polygons).
Links To Prior Learning	• Build on knowledge of four quadrants and to plot straight line graphs in Year 7, in order to interpret conversion graphs, distance-time graphs, line graphs and put into real life context.	• Develop further the use of conventional terms and notation: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection and/or rotation symmetries from Year 7.

	• Build on the ratio and proportion work in Year 7 to problem solving with and applying knowledge of ratios.	• To reason and use proofs to solve problems, calculate missing angles on parallel lines and interior and exterior angles of polygons.
Literacy/ Numeracy	• Language of graphs and ratio. • Extension of deconstructing a written question into mathematical form from Year 7 to more complex problems.	• Language of lines, angles and polygons. • Extension of deconstructing a written question into mathematical form from Year 7 to more complex problems.
Cross Curricular	• Any areas which use graphs or ratio. • Link to real life contexts.	• Any areas which use angles or polygons. • Link to real life contexts such as construction.
Assessment	• Learning checks throughout with low stakes questioning and starters. • Summative assessment at the end of topic.	• Learning checks throughout with low stakes questioning and starters. • Summative assessment at the end of topic.

YEAR 8	**Summer 1**	**Summer 2**
Topics	**Calculating With Fractions** **Straight Line Graphs**	**Percentages, Decimals & Fractions**
Substantive Knowledge – The Knowledge Taught By The Teacher	• Students will learn about the magnitude of fractions. • Students will learn about the different types of fractions. • Students will learn to apply the 4 operations to fractions. • Students will learn to plot straight line graphs from their algebraic equation.	• Students will learn about percentages and how they link to fractions and decimals. • Students will learn how to calculate with percentages.
Disciplinary Knowledge – Concepts, Investigations, Conjecture, Proof, Problem Modelling and Problem Solving	• Understand that straight line graphs are made up of an equation. • Understand the link between an algebraic equation and its graphical properties.	• Understand the interchangeable nature of fractions, decimals and percentages when problem solving. • Understand decimal multipliers and their link to percentages.
Skills	• Interpret fractions and percentages as operators. • Calculate exactly with fractions using the 4 operations. • Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 7/2 or 0.375 or 3/8); change recurring decimals into their corresponding fractions and vice versa. • Identify and interpret gradients and intercepts of linear functions graphically and algebraically using y=mx+c.	• Define percentage as 'number of parts per hundred'; interpret percentages and percentage changes as a fraction or a decimal and interpret these multiplicatively; express one quantity as a percentage of another; compare two quantities using percentages; work with percentages greater than 100%; solve problems involving percentage change, including percentage increase/decrease and original value problems and simple interest including in financial mathematics.

		• Calculating percentage increase/ decrease including using the multiplier. • Look at the link between recurring decimals and fractions.
Links To Prior Learning	• Further develop comparing and calculating with fractions from Year 7. • Use knowledge of four quadrants and plotting simple straight-line graphs from Years 7 and 8.	• Building on calculating with fractions, decimals and finding simple percentages to describe proportions.
Literacy/ Numeracy	• Language of graphs, fractions and percentages. • Extension of deconstructing a written question into mathematical form from Year 7 to more complex problems.	• Language of decimals, fractions and percentages. • Extension of deconstructing a written question into mathematical form from Year 7 to more complex problems.
Cross Curricular	• Any areas which use graphs, fractions or percentages. • Link to real life contexts.	• Any areas which use decimals, fractions or percentages. • Link to real life contexts especially around finance.
Assessment	• Learning checks throughout with low stakes questioning and starters. • Summative assessment at the end of topic.	• Learning checks throughout with low stakes questioning and starters. • Summative assessment at the end of topic.