Department: Mathematics

Hobart High School Key Stage 4 Curriculum Map – Foundation

YEAR 10

	Unit, Topic or Summary of work covered	Knowledge & Skills Developed	Assessment	Personal Development
Autumn 1	Repeated percentage change	Compound interest calculations (U332) Growth and decay (U988)	We continually assess student progress via low stake quizzes, effective questioning, work samples during independent tasks and homework. Towards the end of a half term pupils will complete a test which includes recent topics and recall questions	Development of financial literacy can help students understand the impact of interest on savings and loans and comprehend how investments grow over time. Discussing these mathematical concepts in the context of ethical and environmental awareness can provide insights into issues like resource consumption and sustainability.
	Surface area	Finding the surface area of pyramids (U871) Finding the surface area of cones (U523) Finding the surface area of spheres (U893) Finding the surface area of frustums* (U334) Finding the surface area of composite shapes* (U561)		Development of spatial reasoning and visualization skills. These concepts are applicable to situations such as calculating materials needed for construction or design projects.
	Volume	Finding the volume of pyramids (U484) Finding the volume of cones (U116) Finding the volume of spheres (U617) Finding the volume of frustums* (U350) Finding the volume of composite shapes*(U543)		Visualisation and manipulation of 3 dimensional objects. Links to architecture through famous landmarks such as the Great Pyramid, the Louvre or Sydney Opera house
Autumn 2	Linear simultaneous equations	Solving simultaneous equations using elimination (U760) Solving simultaneous equations using substitution (U757) Solving simultaneous equations graphically (U836) Constructing and solving simultaneous equations (U137)	Towards the end of a term pupils will complete a test which includes recent topics and recall questions	Simultaneous equations are used to model situations that have multiple variables, practical applications in real-world scenarios such as budgeting, engineering, and optimization in business.
	Rearranging formulae	Changing the subjects of formulae with two or more steps (U181)		Algebraic skills can be applied to a variety of real-world contexts such as

	Right-angled trigonometry	Changing the subject when the subject appears more than once (U191) Understanding sin, cos, tan (U605) Finding unknown sides in right-angled triangles (U283) Finding unknown angles in right-angled triangles (U545) Using the exact values of trigonometric ratios (U627) Angles of elevation and depression* (U967) Calculating with trigonometry and bearings* (U164)		engineering, scientific, and financial calculations.
	Constructions and loci	Constructing loci (U820)		
Spring 1	Equations of linear graphs	Equations of parallel lines (U377) Finding the equation of a straight line from its gradient and a point (U477) Finding the equation of a straight line from two points on the line (U848) Equations of parallel and perpendicular lines* (U898)	We continually assess student progress via low stake quizzes, effective questioning, work samples during independent tasks and homework. Towards the end of a half term pupils will complete a test which includes recent topics and recall questions	
	Plotting and interpreting real-life graphs	Plotting linear real-life graphs (U652) Using and finding equations of linear real-life graphs (U862) Sketch graphs of water flows (U896)		Graphs are used to visually model real world situations, they are used to analyse trends, make predictions and inform decisions. Graphical skills have a wide range of applications from science to data analysis.
	Venn diagrams and set notation	Venn diagrams with set notation (U748) Using set notation (U296)		
	Independent and dependent events	Tree diagrams for independent events (U558) Tree diagrams for dependent events (U729)		Tree diagrams for independent and dependent events are valuable tools for visualizing and analysing probabilities in real-world scenarios, such as calculating the likelihood of various outcomes in games, genetics, or decision-making processes, enabling students to

				understand complex relationships and make informed predictions based on data.
Spring 2	Density and pressure	Calculating with density (U910) Calculating with pressure (U527)	Towards the end of a term pupils will complete a test which includes recent topics and recall questions	Calculating with density and pressure is crucial for understanding real-world applications in fields like physics, engineering, and environmental science.
	Working with ratios and algebra	Combining ratios (U921) Calculating with ratios and algebra (U676) Changing ratios (U865)		Combining, calculating with, and changing ratios includes problems in areas such as cooking, finance, and engineering, where understanding proportions helps students make informed decisions regarding resource allocation, scaling recipes, or analysing data relationships,
	Velocity-time graphs	Calculating acceleration from velocity-time graphs (U562) Plotting velocity-time graphs (U937)		Motion in real-world contexts, such as physics and engineering, helps students analyse speed changes over time, enabling them to interpret dynamic systems, predict behaviours.
	Cubic, reciprocal and exponential graphs	Graphs of cubic functions (U980) Graphs of reciprocal functions (U593) Graphs of exponential functions* (U229)		
Summer 1	Arithmetic and geometric sequences	Position-to-term rules for arithmetic sequences (U498) Position-to-term rules for sequences of patterns (U978) Position-to-term rules for geometric sequences (U958)	We continually assess student progress via low stake quizzes, effective questioning, work samples during independent tasks and homework. Towards the end of a half term pupils will complete a test which includes recent topics and recall questions	Develops students' ability to recognize and describe patterns, which is crucial in fields such as computer science, finance, and nature. These concepts help students model and predict behaviours, such as population growth or financial interest, enhancing their analytical skills and enabling them to apply mathematical reasoning to a variety

	Sampling	Sampling and bias (U162)		of sequential patterns and real-world phenomena.

Conducting effective research and making data-driven decisions in real-world contexts, such as market research, public health studies, and social sciences |
	Direct and inverse proportion	Interpreting direct proportion equations (U640) Interpreting inverse proportion equations (U364) Graphs of direct and inverse proportion (U238)		Analyse how changes in one quantity affect another, helping students apply mathematical reasoning to practical problems in economics, science, and engineering, thereby facilitating informed decision-making and strategic planning.
	Transforming shapes	Combining transformations (U766)		
	Error intervals Index laws	Finding error intervals (U657) Finding error intervals for truncated numbers (U301) Index rules with positive indices (U235) Index rules with negative indices (U694) Simplifying expressions using index laws (U662)		Assessing precision in calculations, which are applicable in fields like engineering, statistics, and data analysis.
Summer 2	Expanding and factorising brackets	Expanding double brackets (U768) Factorising quadratic expressions of the form $x^2 + bx + c = 0$ (U178) Factorising the difference of two squares (U963) Factorising to solve quadratic equations of the form $x^2 + bx + c = 0$ (U228)	Alongside the regular formative feedback, pupils will sit two formative assessments. The first is an internal assessment covering the content from Y10. The second is a slightly modified GCSE paper (Paper 1 from the most recent series)	
	Grouped data	Interpreting frequency tables with grouped data (U312) Finding averages from grouped data (U877)		Summarising and analysing large datasets, commonly used in fields like statistics, market research, and social sciences. These techniques enable students to extract meaningful insights from data, supporting informed decision-making and enhancing their ability to

				communicate statistical findings effectively in real-world contexts.
	Drawing and interpreting statistical diagrams	Drawing stem-and-leaf diagrams (U200) Interpreting stem-and-leaf diagrams (U909) Drawing line graphs (U590) Interpreting line graphs (U193) Drawing and interpreting frequency polygons (U840)		

Hobart High School Key Stage 4 Curriculum Map – Foundation

YEAR 11

	Unit, Topic or Summary of work covered	Knowledge & Skills Developed	Assessment	Personal Development
Autumn 1	HCF and LCM	Finding the lowest common multiple (U751) Finding the highest common factor (U529) Prime factor decomposition (U739) Finding the HCF and LCM using prime factor decomposition (U250)	We continually assess student progress via low stake quizzes, effective questioning, work samples during independent tasks and homework. Towards the end of a half term pupils will complete a test which includes recent topics and recall questions	These are foundational skills in number theory that enhance students' problem-solving abilities in various real-world applications, such as optimizing resource allocation and understanding relationships between numbers
	Fractions and mixed numbers	Ordering fractions and mixed numbers (U439) Adding and subtracting mixed numbers (U793) Multiplying with mixed numbers (U224) Dividing with mixed numbers (U538)		These concepts are particularly applicable in real-world contexts such as cooking, finance, and construction, where precise calculations with fractions are often required.
	Simplifying expressions	Simplifying expressions using index laws (U662) Simplifying algebraic fractions by cancelling common factors (U103)		
	Solving equations	Solving equations with two or more steps (U325) Solving equations with the unknown on both sides (U870) Solving equations with the unknown in the denominator (U505) Constructing and solving equations (U599) Factorising to solve quadratic equations of the form $x^2 + bx + c = 0$ $(U228)$ Solving quadratic equations graphically (U601)		These methods, along with constructing and solving equations and factorizing quadratic equations, prepare students for complex mathematical concepts in fields such as physics and engineering. Additionally, solving quadratic equations graphically helps students visualize solutions and understand relationships between variables
	Simultaneous equations	Solving simultaneous equations using elimination (U760)		

		Solving simultaneous equations using substitution (U757) Solving simultaneous equations graphically (U836) Constructing and solving simultaneous equations (U137)		
Autumn 2	Finding unknown angles	Combining angle facts (U655) Angles on parallel lines (U826) Using quadrilateral properties to find angles (U329) Angles in polygons (U427)	Alongside the regular formative feedback, pupils will sit a mock GCSE paper (Paper 2 from the most recent series)	
	Pythagoras' theorem and trigonometry	**U**sing Pythagoras' theorem in 2D (U385) Applying Pythagoras' theorem in 2D (U828) Finding unknown sides in right-angled triangles (U283) Finding unknown angles in right-angled triangles (U545) Using the exact values of trigonometric ratios (U627) Angles of elevation and depression (U967) Calculating bearings (U107) Calculating with trigonometry and bearings (U164)		Provide students with the tools to solve practical problems in fields such as architecture, construction, and navigation.
	Surface area	Finding the surface area of cones and spheres (U771) Finding the surface area of frustums (U334) Finding the surface area of composite shapes (U561)		Development of spatial reasoning and visualization skills. These concepts are applicable to situations such as calculating materials needed for construction or design projects.
	Volume	Finding the volume of cones and spheres (U426) Finding the volume of frustums (U350) Finding the volume of composite shapes (U543)		
	Drawing and interpreting statistical diagrams	Drawing pie charts (U508) Interpreting pie charts (U172) Plotting scatter graphs (U199) Interpreting scatter graphs (U277) Using lines of best fit (U128)		Visualising and summarizing data in various real-world contexts, such as marketing, health studies, and social research.
Spring 1	Theoretical and experimental probability	Probabilities of mutually exclusive events (U683) Sample space diagrams (U104) Expected results from repeated experiments (U166) Venn diagrams with set notation (U748) Using set notation (U296)	We continually assess student progress via low stake quizzes, effective questioning, work samples during independent tasks	Tree diagrams for independent and dependent events are valuable tools for visualizing and analysing probabilities in real-world scenarios, such as calculating the likelihood of various outcomes in

		Tree diagrams for independent events (U558) Tree diagrams for dependent events (U729) Experimental probabilities (U580)	and homework. Towards the end of a half term pupils will complete a test which includes recent topics and recall questions	games, genetics, or decision-making processes, enabling students to understand complex relationships and make informed predictions based on data.
	Linear inequalities	Solving inequalities with the unknown on both sides (U738) Solving double inequalities (U145) Constructing and solving inequalities (U337)		
	Vector problems	Adding and subtracting column vectors (U903) Multiplying column vectors by a scalar (U564) Identifying parallel vectors (U660) Solving geometric problems using vectors (U781)		
	Percentage change	Percentage change with a calculator (U671) Finding original amounts in percentage calculations (U286) Finding the percentage an amount has been changed by (U278) Compound interest calculations (U332) Growth and decay (U988)		Development of financial literacy can help students understand the impact of interest on savings and loans and comprehend how investments grow over time. Discussing these mathematical concepts in the context of ethical and environmental awareness can provide insights into issues like resource consumption and sustainability.
Spring 2	Calculating with compound measures	Calculating with speed (U151) Calculating with rates (U256) Calculating with density (U910) Calculating with pressure (U527)	Alongside the regular formative feedback, pupils will sit a mock GCSE paper (Paper 3 from the most recent series)	Motion in real-world contexts, such as physics and engineering, helps students analyse speed changes over time, enabling them to interpret dynamic systems, predict behaviours.
	Working with ratios and algebra	Combining ratios (U921) Calculating with ratios and algebra (U676) Changing ratios (U865)		

	Proportion word problems	Solving direct proportion word problems (U721) Solving inverse proportion word problems (U357) Currency conversion (U610)		
	Calculating with standard form	Multiplying and dividing numbers in standard form (U264) Adding and subtracting numbers in standard form (U290) Standard form with a calculator (U161)		Handling very large or small quantities, particularly in fields such as science, engineering, and finance, where precision is crucial.
	Arithmetic and geometric sequences	Position-to-term rules for arithmetic sequences (U498) Position-to-term rules for sequences of patterns (U978) Position-to-term rules for geometric sequences (U958) Special sequences (U680)		
	Equations of linear graphs	Plotting straight line graphs (U741) Finding equations of straight line graphs (U315) Interpreting equations of straight line graphs (U669) Equations of parallel lines (U377) Finding the equation of a straight line from its gradient and a point (U477) Finding the equation of a straight line from two points on the line (U848)		
Summer 1				
Summer 2				