Year 8 Mathematics
Curriculum and assessment plan

Aviation High School

Level description	Context and cohort considerations (if applicable)
In Year 8, learning in Mathematics builds on each student's prior learning and experiences. Students engage in a range of approaches to learning and doing mathematics that develop their understanding of and fluency with concepts, procedures and processes by making connections, reasoning, problem-solving and practice. Proficiency in mathematics enables students to respond to familiar and unfamiliar situations by employing mathematical strategies to make informed decisions and solve problems efficiently. Students further develop proficiency and positive dispositions towards mathematics and its use as they: • extend computation with combinations of the 4 operations with integers and positive rational numbers, recognise the relationship between fractions and their terminating or infinite recurring decimal expansions; they convert between fraction and decimal forms of rational numbers and locate them on the real number line • extend the exponent laws to numerical calculations involving positive and zero exponents, and solve a broad range of practical problems, using mental methods, written algorithms and digital tools • use mathematical modelling to solve problems in a broad range of contexts that involve ratios with 2 or more terms, percentage increase and decrease, proportions with decimal values, and rates in measurement contexts, and apply proportional reasoning • manipulate linear and other algebraic expressions, recognise and model situations using linear relations and solve related equations using tables, graphs and algebra • interpret and explain demonstrations and proofs of Pythagoras' theorem and investigate irrational numbers, their infinite non-recurring decimal expansion and their approximate location on the real number line • select metric measurement units fit for purpose, convert between units, recognising the effects of different levels of measurement accuracy on the results of computations, and relate these to interval estimates for measurements in various contexts • apply knowledge of the relationships between π and the features of circles to solve problems involving circumference and area and establish sets of congruency and similarity conditions for common shapes in the plane and create algorithms to test for these conditions, discuss examples and counterexamples • construct and locate objects with reference to three dimensional coordinates using digital tools • consider a variety of situations involving complementary and mutually exclusive events, combinations of 2 events; represent these using tables and diagrams, conducting simulations and calculating corresponding probabilities • examine experimental and observational data and identify populations and samples with respect to context; investigate variation in summary statistics across samples of varying size and discuss their findings.	N/A

Unit 1 — NUMBER	Unit 2 — ALGEBRA & SPACE	Unit 3 — DATA	Unit 4 — MEASUREMENT
Duration: Term 1, 9 Weeks	Duration: Term 2, 9 Weeks	Duration: Term 3, 9 Weeks	Duration: Term 4, 9 Weeks
Students explore number and algebra, establishing connections between different representations of the same number (for example, decimals and fractions) or function (for example, graphical and algebraic representations of linear equations). Students apply algorithms to simplify and solve. Students use a variety of thinking strategies to deepen their understanding, including ending each week with a written version of *Take Note* in WTB. Students participate in number talks to continue to develop mental maths skills, and explore and evaluate different methods for arriving at solutions.	Students build their understanding of linear relationships by representing unknowns with algebra and solving linear equations and inequalities. They interpret solutions on number lines and apply these skills to simple real-world problems. Students strengthen their knowledge of angles and triangles, using complementary, supplementary and vertically opposite angles, and applying angle-sum rules to classify triangles and find missing values. Students explore congruence and similarity, identifying the conditions for each and using scale factors to solve problems involving similar triangles and simple enlargement or reduction. Across the unit, students use diagrams, algebraic reasoning and clear mathematical language to explain their thinking.	Students explore the language of probability, establishing connections with the probability scale. They review conversions between fractions, decimals and percentages to represent the calculation of probability. Students learn how to use notation to represent probability. They demonstrate how to draw and interpret Venn diagrams and two-way tables to solve problems. Students review measures of centre and spread and explore how outliers affect the data. They investigate different sampling methods and their benefits. Students use strategies to minimise bias in data collection and analysis.	Students develop their understanding of measurement by working with perimeter, area and volume, selecting appropriate units and converting between them. They apply these skills to calculate the properties of composite shapes and solve practical measurement problems. Students extend their knowledge of time by working confidently with the 12- and 24-hour clock, converting between the two formats and interpreting real-world time contexts. They calculate time differences, determine travel times and analyse everyday situations involving elapsed time across different time zones or locations. Students build fluency with rates and ratios, representing them in multiple forms and simplifying them where appropriate. They use rates to compare quantities, interpret speed and unit rates, and solve real-world problems involving proportional reasoning. Students deepen their understanding of Pythagoras' theorem, exploring the relationship between the sides of right-angled triangles. They apply the theorem to find unknown side lengths and use it to model simple two-dimensional distance problems.

	Unit 1		Unit 2		Unit 3		Unit 4	
	Assessment	**Timing**	**Assessment**	**Timing**	**Assessment**	**Timing**	**Assessment**	**Timing**
Assessment	**Assessment — Fraction and Integer exam** SUMMATIVE 40% Investigation Written response Groups data collection, Individual response	Week 4	**Task 1: Experiment with linear solutions** SUMMATIVE 40% Investigation Written response	Week 4	**Progressive Exam – Probability** SUMMATIVE 10% Mathspace Individual response (electronic)	Week 5	**TASK 1 - Exam – Ratios and Rates** SUMMATIVE 50% In Class Assessment Individual response	Week 4
	Progressive exam Summative 10% Mathspace Short response (electronic) Individual response	Week 8	**Progressive exam** Summative 10% Mathspace Short response (electronic) Individual response	Week 5	**TASK 1: Probability Simulations** SUMMATIVE 40% Investigation Written response Groups data collection, individual response	Week 6	**TASK 2 – Exam - Measurement** SUMMATIVE 50% In Class assessment Individual response	Week 9
	TASK 2: End of Term Exam Algebra SUMMATIVE 40% Examination Short response Individual response	Week 10	**TASK 2: End of Term Exam Geometry** SUMMATIVE 40% Examination Short response	Week 9	**Task 2: Random Sampling** SUMMATIVE 40% Investigation Written response Groups data collection, individual response	Week 9		

	Unit 1	Unit 2	Unit 3	Unit 4
Achievement standard	By the end of Year 8, students recognise irrational numbers and terminating or recurring decimals. They apply the exponent laws to calculations with numbers involving positive integer exponents. Students solve problems involving the 4 operations with integers and positive rational numbers. They use mathematical modelling to solve practical problems involving ratios, percentages and rates in measurement and financial contexts. Students apply algebraic properties to rearrange, expand and factorise linear expressions. They graph linear relations and solve linear equations with rational solutions and one-variable inequalities, graphically and algebraically. Students use mathematical modelling to solve problems using linear relations, interpreting and reviewing the model in context. They make and test conjectures involving linear relations using digital tools.

Students use appropriate metric units when solving measurement problems involving the perimeter and area of composite shapes, and volume of right prisms. They use Pythagoras' theorem to solve measurement problems involving unknown lengths of right-angle triangles. Students use formulas to solve problems involving the area and circumference of circles. They solve problems of duration involving 12- and 24-hour cycles across multiple time zones. Students use 3 dimensions to locate and describe position. They identify conditions for congruency and similarity in shapes and create and test algorithms designed to test for congruency and similarity. Students apply the properties of quadrilaterals to solve problems.

They conduct statistical investigations and explain the implications of obtaining data through sampling. Students analyse and describe the distribution of data. They compare the variation in distributions of random samples of the same and different size from a given population with respect to shape, measures of central tendency and range. Students represent the possible combinations of 2 events with tables and diagrams, and determine related probabilities to solve practical problems. They conduct experiments and simulations using digital tools to determine related probabilities of compound events. | By the end of Year 8, students recognise irrational numbers and terminating or recurring decimals. They apply the exponent laws to calculations with numbers involving positive integer exponents. Students solve problems involving the 4 operations with integers and positive rational numbers. They use mathematical modelling to solve practical problems involving ratios, percentages and rates in measurement and financial contexts. Students apply algebraic properties to rearrange, expand and factorise linear expressions. They graph linear relations and solve linear equations with rational solutions and one-variable inequalities, graphically and algebraically. Students use mathematical modelling to solve problems using linear relations, interpreting and reviewing the model in context. They make and test conjectures involving linear relations using digital tools.

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| **Moderation** | Week 10 – Faculty based moderation | Week 10 – Blind moderation | Week 10 – Faculty based moderation | Week 10 – Blind moderation |

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Content descriptions	Units				Content descriptions	Units				Content descriptions	Units			
Number	1	2	3	4	**Algebra**	1	2	3	4	**Measurement**	1	2	3	4
recognise irrational numbers in applied contexts, including square roots and π AC9M8N01	☑	☐	☐	☑	create, expand, factorise, rearrange and simplify linear expressions, applying the associative, commutative, identity, distributive and inverse properties AC9M8A01	☑	☑	☐	☐	solve problems involving the area and perimeter of irregular and composite shapes using appropriate units AC9M8M01	☑	☐	☐	☑
establish and apply the exponent laws with positive integer exponents and the zero-exponent, using exponent notation with numbers AC9M8N02	☑	☑	☐	☐	graph linear relations on the Cartesian plane using digital tools where appropriate; solve linear equations and one-variable inequalities using graphical and algebraic techniques; verify solutions by substitution AC9M8A02	☑	☑	☐	☐	solve problems involving the volume and capacity of right prisms using appropriate units AC9M8M02	☐	☐	☐	☑
recognise terminating and recurring decimals, using digital tools as appropriate AC9M8N03	☑	☐	☐	☑	use mathematical modelling to solve applied problems involving linear relations, including financial contexts; formulate problems with linear functions, choosing a representation; interpret and communicate solutions in terms of the situation, reviewing the appropriateness of the model AC9M8A03	☑	☑	☐	☐	solve problems involving the circumference and area of a circle using formulas and appropriate units AC9M8M03	☑	☐	☐	☑
use the 4 operations with integers and with rational numbers, choosing and using efficient strategies and digital tools where appropriate AC9M8N04	☑	☐	☐	☑	experiment with linear functions and relations using digital tools, making and testing conjectures and generalising emerging patterns AC9M8A04	☐	☑	☐	☐	solve problems involving duration, including using 12- and 24-hour time across multiple time zones AC9M8M04	☐	☐	☐	☑
use mathematical modelling to solve practical problems involving rational numbers and percentages, including financial contexts; formulate problems, choosing efficient calculation strategies and using digital tools where appropriate; interpret and communicate solutions in terms of the situation, reviewing the appropriateness of the model AC9M8N05	☐	☐	☐	☑						recognise and use rates to solve problems involving the comparison of 2 related quantities of different units of measure AC9M8M05	☐	☐	☐	☑
										use Pythagoras' theorem to solve problems involving the side lengths of right-angled triangles AC9M8M06	☐	☐	☐	☑
										use mathematical modelling to solve practical problems involving ratios and rates, including financial contexts; formulate problems; interpret and communicate solutions in terms of the situation, reviewing the appropriateness of the model AC9M8M07	☐	☐	☐	☑

Content descriptions	Units				Content descriptions	Units				Content descriptions	Units			
Space	1	2	3	4	**Statistics**	1	2	3	4	**Probability**	1	2	3	4
identify the conditions for congruence and similarity of triangles and explain the conditions for other sets of common shapes to be congruent or similar, including those formed by transformations AC9M8SP01	☐	☑	☐	☐	investigate techniques for data collection including census, sampling, experiment and observation, and explain the practicalities and implications of obtaining data through these techniques AC9M8ST01	☐	☐	☑	☐	recognise that complementary events have a combined probability of one; use this relationship to calculate probabilities in applied contexts AC9M8P01	☐	☐	☑	☐
establish properties of quadrilaterals using congruent triangles and angle properties, and solve related problems explaining reasoning AC9M8SP02	☐	☑	☐	☐	analyse and report on the distribution of data from primary and secondary sources using random and non-random sampling techniques to select and study samples AC9M8ST02	☐	☐	☑	☐	determine all possible combinations for 2 events, using two way tables, tree diagrams and Venn diagrams, and use these to determine probabilities of specific outcomes in practical situations AC9M8P02	☐	☐	☑	☐
describe the position and location of objects in 3 dimensions in different ways, including using a three dimensional coordinate system with the use of dynamic geometric software and other digital tools AC9M8SP03	☐	☑	☐	☐	compare variations in distributions and proportions obtained from random samples of the same size drawn from a population and recognise the effect of sample size on this variation AC9M8ST03	☐	☐	☑	☐	conduct repeated chance experiments and simulations, using digital tools to determine probabilities for compound events, and describe results AC9M8P03	☐	☐	☑	☐
design, create and test algorithms involving a sequence of steps and decisions that identify congruency or similarity of shapes, and describe how the algorithm works AC9M8SP04	☐	☑	☐	☐	plan and conduct statistical investigations involving samples of a population; use ethical and fair methods to make inferences about the population and report findings, acknowledging uncertainty AC9M8ST04	☐	☐	☑	☐					

General capabilities	Units			
	1	2	3	4
Critical and creative thinking	☑	☑	☑	☑
Digital literacy	☐	☑	☑	☐
Ethical understanding	☐	☐	☑	☐
Intercultural understanding	☐	☐	☑	☑
Literacy	☑	☑	☑	☑
Numeracy	☑	☑	☑	☑
Personal and social capability	☐	☐	☑	☐

Cross-curriculum priorities	Units			
	1	2	3	4
Aboriginal and Torres Strait Islander histories and cultures	☐	☐	☐	R
Asia and Australia's engagement with Asia	☐	R	R	☐
Sustainability	R	☐	☐	☐