Year level plan	Mathematics	Year level	Year 7

Curriculum intent	**Year level description**	The proficiency strands *Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content across the three content strands: Number and Algebra, Measurement and Geometry, and Statistics and Probability. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics. At this year level: **Understanding** includes describing patterns in uses of indices with whole numbers, recognising equivalences between fractions, decimals, percentages and ratios, plotting points on the Cartesian plane, identifying angles formed by a transversal crossing a pair of lines, and connecting the laws and properties of numbers to algebraic terms and expressions. **Fluency** includes calculating accurately with integers, representing fractions and decimals in various ways, investigating best buys, finding measures of central tendency and calculating areas of shapes and volumes of prisms. **Problem Solving** includes formulating and solving authentic problems using numbers and measurements, working with transformations and identifying symmetry, calculating angles and interpreting sets of data collected through chance experiments. **Reasoning** includes applying the number laws to calculations, applying known geometric facts to draw conclusions about shapes, applying an understanding of ratio and interpreting data displays.
	Achievement standard	By the end of Year 7, students solve problems involving the comparison, addition and subtraction of integers. They make the connections between whole numbers and index notation and the relationship between perfect squares and square roots. They solve problems involving percentages and all four operations with fractions and decimals. They compare the cost of items to make financial decisions. Students represent numbers using variables. They connect the laws and properties for numbers to algebra. They interpret simple linear representations and model authentic information. Students describe different views of three-dimensional objects. They represent transformations in the Cartesian plane. They solve simple numerical problems involving angles formed by a transversal crossing two lines. Students identify issues involving the collection of continuous data. They describe the relationship between the median and mean in data displays. Students use fractions, decimals and percentages, and their equivalences. They express one quantity as a fraction or percentage of another. Students solve simple linear equations and evaluate algebraic expressions after numerical substitution. They assign ordered pairs to given points on the Cartesian plane. Students use formulas for the area and perimeter of rectangles and calculate volumes of rectangular prisms. Students classify triangles and quadrilaterals. They name the types of angles formed by a transversal crossing parallel line. Students determine the sample space for simple experiments with equally likely outcomes and assign probabilities to those outcomes. They calculate mean, mode, median and range for data sets. They construct stem-and-leaf plots and dot-plots.

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Unit Overview		SEMESTER 1		SEMESTER 2	
Sequencing teaching and learning		**Unit 1**	**Unit 2**	**Unit 3**	**Unit 4**
		Students develop understandings of: • Number and place value — investigate the relationship between index notation, square roots and square numbers, apply the associative, commutative and distributive laws to aid computation, revise prime factors, express numbers as a product of its primes using index notation. • Real numbers — compare fractions using equivalence, locate and represent fractions on a number line, solve problems involving addition and subtraction of fractions, express one quantity as a fraction of another. • Using units of measurement — develop a formula to find the area of a rectangle, calculate the area of rectangles, investigate the relationship between volume, the area of the base and the number of layers, calculate volume, solve problems involving area and volume. • Shape — construct 3D objects, draw 3D objects from different viewpoints. • Geometric reasoning — revise triangles, quadrilaterals and types of angles, classify triangles and quadrilaterals by comparing sides and angles, make generalisations about the sum of angles in triangles and in quadrilaterals.	Students develop understandings of: • Real numbers — add and subtract fractions with unrelated denominators, explore the relationship between fractions, decimals and percentages, express one quantity as a percentage of another, interpret, represent and simplify ratios. • Patterns and algebra — use variables to represent numbers, create algebraic expressions, evaluate algebraic expressions by substitution. • Linear and non-linear relationships — plot points on a Cartesian plane, find coordinates for points on a Cartesian plane, solve simple linear equations and create and analyse graphs from authentic data. • Chance — identify sample spaces for single-step events, conduct one-step chance experiments, record observed frequencies in a table, calculate probabilities from experimental data, compare experimental and theoretical probabilities.	Students develop understandings of: • Number and place value — compare, order, add and subtract integers using written strategies, solve problems involving addition and subtraction of integers, review index notation and standard notation, explore the powers of ten and convert numbers to expanded notation. • Real numbers — Round, multiply and divide decimals in a money context, multiply and divide fractions, add and subtract mixed numbers with unrelated denominators, solve problems involving decimals, fractions and the four operations ,solve problems involving ratios, multiply decimals using written strategies, convert between fractions, decimals and percentage and express one quantity as a fraction or percentage of another. • Money and financial mathematics — calculate and compare unit prices, investigate and calculate best buys with and without digital technology. • Patterns and algebra — create and evaluate formulas to model relationships between two variables.	Students develop understandings of: • Location and transformation — describe and create translations, reflections and rotations on the Cartesian plane, use appropriate conventions for naming transformed shapes, identify a combination of transformations on the Cartesian plane, and identify line and rotational symmetry. • Geometric reasoning — develop geometry conventions and angle relationships, explore transversals and angles associated with parallel lines and find unknown angles using angle relationships. • Data representation and interpretation — construct stem-and-leaf plots and dot-plots, calculate mean, median, mode and range, compare a range of data displays, describe and interpret data displays using mean, median and range, identify and examine issues involving numerical data collected from primary and secondary sources.
	General capabilities and cross-curriculum priorities	Opportunities to engage with:	Opportunities to engage with:	Opportunities to engage with:	Opportunities to engage with:

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	Key	*General capabilities*		*Cross-curriculum priorities*
		Literacy Numeracy Information and Communication Technology (ICT) Capability	Personal and Social Capability Ethical Understanding Intercultural Understanding Critical and Creative thinking	Aboriginal and Torres Strait Islander Histories and Cultures Asia and Australia's Engagement with Asia Sustainability

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<table>
<tr><td rowspan="4">Assessment</td><td>Assessment</td><td colspan="4">Student responses to summative assessment tasks contribute to their assessment folio. It provides evidence of their learning and represents their achievements over reporting period. The assessment folio should include a range and balance of assessments to make valid judgments about whether the student has met the achievement standard.</td></tr>
<tr><td></td><td colspan="2">Semester 1</td><td colspan="2">Semester 2</td></tr>
<tr><td></td><td>Unit 1: Investigating index notation, fractions and integers
Short answer questions:
Students connect whole numbers and index notation, and solve problems involving fractions and integers.</td><td>Unit 2: Solving algebra and chance problems
Short answer questions
Students model and solve linear representations, construct sample spaces and assign probabilities.</td><td>Unit 3: Making financial decisions
Written
Students calculate and use unit pricing to make financial decisions to develop a costed catering plan.</td><td>Unit 4: Applying data and geometry concepts
Short answer questions
Students use data displays and measures of centre to make decisions, apply parallel angle relationships and represent transformations.</td></tr>
<tr><td></td><td>Unit 1: Investigating properties of shape and solving an authentic problem
Assignment/Project
Students identify properties of shapes and solve authentic problems using measurements.</td><td></td><td>Unit 3: Applying integer and real number concepts
Short answer questions
Students perform calculations and solve problems involving integers, index notation, fractions, decimals, and percentage.</td><td></td></tr>
<tr><td>Moderation</td><td>Consistency of teacher judgments</td><td colspan="4">Teachers use moderation to support consistency of teacher judgments and comparability of reported results against the relevant achievement standards.</td></tr>
</table>

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Content descriptions for Year 7 Mathematics

Review for balance and coverage of content descriptions

Number and Algebra	Semester 1		Semester 2	
	Unit 1	Unit 2	Unit 3	Unit 4
Number and place value				
Investigate index notation and represent whole numbers as products of powers of prime numbers. (ACMNA149)	✓		✓	
Investigate and use square roots of perfect square numbers. (ACMNA150)	✓			
Apply the associative, commutative and distributive laws to aid mental and written computation. (ACMNA151)	✓			
Compare, order, add and subtract integers. (ACMNA280)	✓		✓	
Real numbers				
Compare fractions using equivalence. Locate and represent positive and negative fractions and mixed numbers on a number line. (ACMNA152)	✓			
Solve problems involving addition and subtraction of fractions, including those with unrelated denominators. (ACMNA153)	✓	✓	✓	
Multiply and divide fractions and decimals using efficient written strategies and digital technologies. (ACMNA154)			✓	
Express one quantity as a fraction of another, with and without the use of digital technologies. (ACMNA155)	✓		✓	
Round decimals to a specified number of decimal places. (ACMNA156)			✓	
Connect fractions, decimals and percentages and carry out simple conversions. (ACMNA157)		✓	✓	
Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies. (ACMNA158)		✓		
Recognise and solve problems involving simple ratios. (ACMNA173)		✓	✓	
Money and financial mathematics				
Investigate and calculate 'best buys', with and without digital technologies. (ACMNA174)			✓	
Patterns and algebra				
Introduce the concept of variables as a way of representing numbers using letters. (ACMNA175)		✓	✓	
Create algebraic expressions and evaluate them by substituting a given value for each variable. (ACMNA176)		✓	✓	
Extend and apply the laws and properties of arithmetic to algebraic terms and expressions. (ACMNA177)		✓		
Linear and non-linear relationships				
Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point. (ACMNA178)		✓		
Solve simple linear equations. (ACMNA179)		✓		
Number and place value				
Investigate, interpret and analyse graphs from authentic data. (ACMNA180)		✓		
Measurement and Geometry	**Semester 1**		**Semester 2**	
	Unit 1	**Unit 2**	**Unit 3**	**Unit 4**
Using units of measurement				
Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving. (ACMMG159)	✓	✓		
Calculate volumes of rectangular prisms. (ACMMG160)	✓			

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Shape				
Draw different views of prisms and solids formed from combinations of prisms. (ACMMG161)	✓			
Location and transformation				
Describe translations, reflections in an axis, and rotations of multiples of 90° on the Cartesian plane using coordinates. Identify line and rotational symmetries. (ACMMG181)				✓
Geometric reasoning				
Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal. (ACMMG163)				✓
Investigate conditions for two lines to be parallel and solve simple numerical problems using reasoning. (ACMMG164)				✓
Demonstrate that the angle sum of a triangle is 180° and use this to find the angle sum of a quadrilateral. (ACMMG166)	✓			
Classify triangles according to their side and angle properties and describe quadrilaterals. (ACMMG165)	✓			
Statistics and Probability	**Semester 1**		**Semester 2**	
	Unit 1	**Unit 2**	**Unit 3**	**Unit 4**
Chance				
Construct sample spaces for single-step experiments with equally likely outcomes. (ACMSP167)		✓		
Assign probabilities to the outcomes of events and determine probabilities for events. (ACMSP168)		✓		
Data and representation				
Identify and investigate issues involving numerical data collected from primary and secondary sources. (ACMSP169)				✓
Construct and compare a range of data displays including stem-and-leaf plots and dot plots. (ACMSP170)				✓
Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data. (ACMSP171)				✓
Describe and interpret data displays using median, mean and range. (ACMSP172)				✓

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