Year 7 Mathematics
Curriculum and assessment plan

Example

Level description	Context and cohort considerations (if applicable)
In Year 7, 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 their understanding of the integer and rational number systems; strengthen their fluency with mental calculation, written algorithms and digital tools; and routinely consider the reasonableness of results in context • use exponents and exponent notation to consolidate and formalise their understanding of representations of natural numbers, and use these to make conjectures involving natural numbers by experiment with the assistance of digital tools • recognise the use of algebraic expressions and formulas using conventions, notations, symbols and pronumerals. They interpret algebraic expressions and formulas, use substitution to evaluate and determine unknown terms where other values are given, and solve simple equations using a variety of methods • use mathematical modelling to solve practical problems involving rational numbers, ratios and percentages, formulating and making choices about representations, calculation strategies and communicating solutions within the context • use variables, constants, relations and functions to express relationships in real life data and interpret key features of their representation in rules, tables and graphs • extend their knowledge of angles to establish further relationships and apply these when solving measurement and spatial problems • create and use algorithms to classify shapes in the plane and use tools to construct shapes, including two-dimensional representations of prisms and other objects • use coordinates in the Cartesian plane to describe transformations • apply the statistical investigation process to obtain numerical data related to questions of interest, choose displays for the distributions of data and interpret summary statistics for determining the centre and spread of the data in context • conduct probability simulations and experiments involving chance events, construct corresponding sample spaces and observe related frequencies, comparing expected, simulated and experimental results.	The Year 7 cohort participates in regular mathematics lessons. The cohort join from a variety of feeder primary schools. Formative and diagnostic assessment is used early in Term 1 to identify areas needing support and targeted planning. This plan has considered: • data collected from transition interviews • timing of NAPLAN in Term 1 • summative and formative data from Year 6 showing the need to support measurement and fractional understandings • exploration and use of digital tools, e.g. virtual materials, electronic devices, simulation programs and dynamic geometric software, in relevant contexts that support the learning and doing of mathematics.

Unit 1 — The power of numbers and statistics	Unit 2 — Let's be rational and look at all the angles	Unit 3 — Represent and simulate real life	Unit 4 — Shaping up and taking a different view
Duration: 10 weeks	**Duration: 10 weeks**	**Duration: 10 weeks**	**Duration: 10 weeks**
Critical thinking is an essential skill needed for solving problems and data analysis. In this unit, students use their critical thinking skills to breakdown complex information and problems into smaller and more manageable parts for analysis. Students then solve the individual parts and find solutions to problems more effectively and efficiently. The first phase of this unit builds on number concepts from Year 6. Students develop an understanding of the base 10 number system, as they adapt and represent natural numbers in expanded form. Students continue to develop fluency when using efficient calculation strategies to solve problems involving addition and subtraction of integers and all four operations, including rational numbers (fractions, decimals and percentages). Through the exploration of prime factors, e.g. creating factor trees, identifying lowest common multiples and highest common factors, students develop the foundational understanding of the Fundamental Theorem of Arithmetic and use exponent notation to represent numbers in different ways. Students investigate squares of natural numbers by connecting them to visual representations, e.g. with dots or counters, and explore and describe the relationship between perfect square numbers and square roots. Students demonstrate their understanding and fluency to solve problems in an examination. The second phase of this unit focuses on developing critical thinking skills to plan and conduct statistical investigations in order to better understand their class members' interests and hobbies. Students develop two questions to investigate: one to gather discrete numerical data, e.g. how many students play a certain sport, and the other to gather continuous numerical data, e.g. number of hours spent playing a particular sport. Students create different types of numerical data displays, e.g. stem and leaf, dot plots, histograms, using digital tools. Using these data displays, students then describe and compare the distribution of data using the summary of statistics, e.g. shape, centre and spread, including outliers, and central tendencies (mode, mean and median). Students provide insights into the nature of the distribution of data and explain their reasoning. The statistical investigation project provides opportunity for students to apply their understanding, fluency and reasoning skills in a school-related context.	Mathematics allows students to be creative when representing mathematical understanding and skills in different ways and applying their learning to various fields and disciplines. In this unit, students use mathematical modelling to solve practical problems involving rational numbers, percentages and ratios in financial and other applied contexts. Students then explore and represent angle relationships and triangles, areas and volumes of rectangular and triangular prisms to solve problems. In the first phase of this unit, students continue to build on their knowledge of rational numbers from Unit 1 to include using equivalent representations to assist with calculations involving rational numbers. Students use representations to develop a conceptual understanding of ratios and to solve ratio and percentage problems. The mathematical modelling project provides an opportunity for students to apply their problem-solving proficiencies to model a financial problem and to determine the quantity and cost of ingredients required to make a refreshment that will yield a high profit at the school fete. They select and use appropriate digital tools, e.g. spreadsheets, to automate and efficiently complete tasks. In the second phase of this unit, students use dynamic geometric software to build on their angle understandings from Year 6 to explore and represent angles formed when parallel lines are crossed by a transversal, e.g. corresponding, alternate and co-interior angles. They investigate angles in a triangle by using paper triangles and tearing to demonstrate the sum of the interior angles of a triangle is 180º. Students further develop critical thinking skills by identifying aspects of a problem and applying knowledge of angle relationships and the sum of angles in a triangle to solve problems using logic and geometric reasoning. Students build on student knowledge of area from Year 6 to include using formulas for the areas of triangles and parallelograms and solving problems using formulas for the volume of rectangular and triangular prisms. The unit culminates with an end of term fluency examination.	Mathematics is central to all daily interactions and transactions. In this unit, students continue to build on their critical and creative thinking skills to represent mathematics in different ways, using approaches and strategies suitable in familiar and unfamiliar situations. Algebra and probability provide the opportunity to identify, represent and solve real-life problems using algebraic expressions, formulas and simulations. In the first phase of this unit, students use critical and creative thinking skills to understand the foundational algebraic concept of using variables to represent unknown values and develop the skills to formulate algebraic expressions to represent real-life situations, e.g. gardening problems using the area model. Students build on their knowledge of substitution to solve problems from Unit 2, by using formulas to determine unknown values. They find the unknown values in one-variable linear equations algebraically. Algebraic equations are explored in real-life contexts, e.g. financial and health and fitness scenarios, including using diagrams, manipulates and digital tools, e.g. algebra titles and spreadsheets, to form linear growth patterns. These mathematical concepts are assessed through an end of term understanding and fluency examination. In the second phase of this unit, students design and conduct repeated chance experiments and simulations, using digital tools. Students collect and access data to conduct these experiments and simulations using real-life context, such as games involving throwing a coin or dice. They assign probabilities, using rational numbers for single-staged events, e.g. tossing a coin or rolling a dice, and make predictions based on the relative frequencies of these events. Students use critical and creative thinking skills to explore the law of large numbers in a problem-solving probability experiment and simulation project, demonstrating understanding, fluency and reasoning proficiencies.	Spatial awareness requires individuals to visualise and represent their surroundings to enable the manipulation and analysis of shapes and objects to solve problems. This unit requires students to explore the attributes of shapes and objects in order to make precise classifications, transformations and representations of shapes and objects. In the first phase of this unit, students investigate and describe how pi (π) is the constant in the proportional relationship between the radius, diameter and circumference of a circle. They compare the circumference of circles in relation to their diameter by drawing several circles with a compass, using string to approximate the circumference, and then comparing the lengths of string to the diameter of the circle. Students use critical and creative thinking skills to explore how these relationships can be used to predict the approximate measurements of a circle. In the second phase of this unit, students classify polygons according to their features. They use coordinates to plot and describe the transformation, e.g. translation, rotation and rotation, of shapes (including polygons) on a Cartesian plane. Students then explore and represent three-dimensional objects in two-dimensional representations, e.g. viewpoints, nets, isometric and perspective drawings. Through the use of examples, students discuss the advantages and disadvantages of the different representations. The unit culminates with an end of term understanding and fluency examination, which includes the problem-solving proficiencies to create an algorithm designed to sort and classify shapes according to their attributes and features.

Where there is one assessment item within a unit, the corresponding achievement standard aspect/s is indicated in blue.

Where there is a second assessment item within a unit, the corresponding achievement standard aspect/s is indicated in yellow.

	Unit 1 — The power of numbers and statistics		Unit 2 — Let's be rational and look at all the angles		Unit 3 — Represent and simulate real life		Unit 4 — Shaping up and taking a different view	
Assessment	**Assessment 1 — Examination**	**Term/ week**	**Assessment 3 — Project: Mathematical modelling**	**Term/ week**	**Assessment 5 — Examination**	**Term/ week**	**Assessment 7— Examination: involving computational thinking**	**Term/ week**
	Description: Students answer short response understanding and fluency questions focusing on: • representing natural numbers in expanded form and exponent notations • solving problems including squares of numbers and square roots of perfect square numbers • solving problems including addition and subtraction of integers • using all four operations in calculations involving positive fractions and decimals. **Technique:** Examination **Mode:** Written **Conditions:** • up to 70 minutes, plus 5 minutes perusal, under supervised conditions • non-calculator	Term 1 Week 5	**Description:** Students apply their knowledge of ratio and percentages and use mathematical modelling problem-solving process to find a refreshment recipe that will yield a high profit at the school fete. Student will submit a proposal to the Head of Year 7 providing reasons why their refreshment recipe should be selected. **Technique:** Project **Mode:** Written **Conditions:** • issued in week 2 and completed by end of week 3 • written responses up to 600 words	Term 2 Week 3	**Description:** Students answer understanding and fluency short response questions focusing on: • using algebraic expressions to represent situations • substituting values into formulas to determine unknown values • solving simple linear equations • creating and graphing tables of values related to algebraic expressions and formulas • manipulating formulas and describing the effects of variation. **Technique:** Examination **Mode:** Written **Conditions:** • up to 70 minutes, including 5 minutes perusal • supervised conditions • calculator permitted	Term 3 Week 6	**Description:** Students answer understanding, fluency, reasoning and problem-solving short response questions focusing on: • describing the relationships between the features of circles • representing objects two-dimensionally in different ways • describing the usefulness of these representations • creating an algorithm (flowchart) designed to sort and classify shapes • using coordinates to describe transformations of points on a Cartesian plane. **Technique:** Examination **Mode:** Written **Conditions:** • up to 70 minutes, including 5 minutes perusal • supervised conditions • calculator permitted	Term 4 Week 8
	Assessment 2 — Project: Statistical investigation	**Term/ week**	**Assessment 4 — Examination**	**Term/ week**	**Assessment 6 — Project: Probability experiment and simulations**	**Term/ week**		
	Description: Students plan and conduct a problem-solving statistical investigation exploring the hobbies and interests of their class members. Students develop two questions to investigate: one to gather discrete numerical data, e.g. how many students play a certain sport, and the other to gather continuous numerical data, e.g. number of hours spent playing a particular sport. Students represent and interpret the data using the shape of distribution and decide which measure of central tendency is most useful and why. Students demonstrate their understanding, fluency and reasoning skills in a written report. Technique: Project Mode: Written Conditions: • issued in week 8 and completed by end of week 9 (including 3 hours of class time) • written responses up to 600 words	Term 1 Week 9	**Description**: Students answer short response fluency questions focusing on: • application of angle relationships • sum of angles in a triangle to solve problems • using formulas for the areas of triangles and parallelograms • using formulas for the volumes of rectangular and triangular prisms to solve problems. **Technique:** Examination **Mode:** Written **Conditions:** • up to 70 minutes, including 5 minutes perusal • supervised conditions • calculator permitted	Term 2 Week 9	**Description:** Students design an experiment to test the law of large numbers. Students conduct a number of different size trials that increase in sample sizes by using simulations. They seek to show that the average of the results obtained should become closer to the expected outcome as more trials are conducted. They demonstrate their understanding, fluency and reasoning proficiencies in a written problem-solving report. **Technique:** Project **Mode:** Written **Conditions:** • issued in week 8 and completed over 1 weeks (including 3 hours of class time) • completed by end of week 9 • written responses up to 600 words	Term 3 Week 9		

	Unit 1 — The power of numbers and statistics	Unit 2 — Let's be rational and look at all the angles	Unit 3 — Represent and simulate real life	Unit 4 — Shaping up and taking a different view
Achievement standard	By the end of Year 7, students represent natural numbers in expanded form and as products of prime factors, using exponent notation. They solve problems involving squares of numbers and square roots of perfect square numbers. Students solve problems involving addition and subtraction of integers. They use all 4 operations in calculations involving positive fractions and decimals, choosing efficient calculation strategies. Students choose between equivalent representations of rational numbers and percentages to assist in calculations. They use mathematical modelling to solve practical problems involving rational numbers, percentages and ratios, in financial and other applied contexts, justifying choices of representation. Students use algebraic expressions to represent situations, describe the relationships between variables from authentic data and substitute values into formulas to determine unknown values. They solve linear equations with natural number solutions. Students create tables of values related to algebraic expressions and formulas, and describe the effect of variation. They apply knowledge of angle relationships and the sum of angles in a triangle to solve problems, giving reasons. Students use formulas for the areas of triangles and parallelograms and the volumes of rectangular and triangular prisms to solve problems. They describe the relationships between the radius, diameter and circumference of a circle. Students classify polygons according to their features and create an algorithm designed to sort and classify shapes. They represent objects two-dimensionally in different ways, describing the usefulness of these representations. Students use coordinates to describe transformations of points in the plane. They plan and conduct statistical investigations involving discrete and continuous numerical data, using appropriate displays. Students interpret data in terms of the shape of distribution and summary statistics, identifying possible outliers. They decide which measure of central tendency is most suitable and explain their reasoning. Students list sample spaces for single step experiments, assign probabilities to outcomes and predict relative frequencies for related events. They conduct repeated single-step chance experiments and run simulations using digital tools, giving reasons for differences between predicted and observed results.	By the end of Year 7, students represent natural numbers in expanded form and as products of prime factors, using exponent notation. They solve problems involving squares of numbers and square roots of perfect square numbers. Students solve problems involving addition and subtraction of integers. They use all 4 operations in calculations involving positive fractions and decimals, choosing efficient calculation strategies. Students choose between equivalent representations of rational numbers and percentages to assist in calculations. They use mathematical modelling to solve practical problems involving rational numbers, percentages and ratios, in financial and other applied contexts, justifying choices of representation. Students use algebraic expressions to represent situations, describe the relationships between variables from authentic data and substitute values into formulas to determine unknown values. They solve linear equations with natural number solutions. Students create tables of values related to algebraic expressions and formulas, and describe the effect of variation. They apply knowledge of angle relationships and the sum of angles in a triangle to solve problems, giving reasons. Students use formulas for the areas of triangles and parallelograms and the volumes of rectangular and triangular prisms to solve problems. They describe the relationships between the radius, diameter and circumference of a circle. Students classify polygons according to their features and create an algorithm designed to sort and classify shapes. They represent objects two-dimensionally in different ways, describing the usefulness of these representations. Students use coordinates to describe transformations of points in the plane. They plan and conduct statistical investigations involving discrete and continuous numerical data, using appropriate displays. Students interpret data in terms of the shape of distribution and summary statistics, identifying possible outliers. They decide which measure of central tendency is most suitable and explain their reasoning. Students list sample spaces for single step experiments, assign probabilities to outcomes and predict relative frequencies for related events. They conduct repeated single-step chance experiments and run simulations using digital tools, giving reasons for differences between predicted and observed results.	By the end of Year 7, students represent natural numbers in expanded form and as products of prime factors, using exponent notation. They solve problems involving squares of numbers and square roots of perfect square numbers. Students solve problems involving addition and subtraction of integers. They use all 4 operations in calculations involving positive fractions and decimals, choosing efficient calculation strategies. Students choose between equivalent representations of rational numbers and percentages to assist in calculations. They use mathematical modelling to solve practical problems involving rational numbers, percentages and ratios, in financial and other applied contexts, justifying choices of representation. Students use algebraic expressions to represent situations, describe the relationships between variables from authentic data and substitute values into formulas to determine unknown values. They solve linear equations with natural number solutions. Students create tables of values related to algebraic expressions and formulas, and describe the effect of variation. They apply knowledge of angle relationships and the sum of angles in a triangle to solve problems, giving reasons. Students use formulas for the areas of triangles and parallelograms and the volumes of rectangular and triangular prisms to solve problems. They describe the relationships between the radius, diameter and circumference of a circle. Students classify polygons according to their features and create an algorithm designed to sort and classify shapes. They represent objects two-dimensionally in different ways, describing the usefulness of these representations. Students use coordinates to describe transformations of points in the plane. They plan and conduct statistical investigations involving discrete and continuous numerical data, using appropriate displays. Students interpret data in terms of the shape of distribution and summary statistics, identifying possible outliers. They decide which measure of central tendency is most suitable and explain their reasoning. Students list sample spaces for single step experiments, assign probabilities to outcomes and predict relative frequencies for related events. They conduct repeated single-step chance experiments and run simulations using digital tools, giving reasons for differences between predicted and observed results.	By the end of Year 7, students represent natural numbers in expanded form and as products of prime factors, using exponent notation. They solve problems involving squares of numbers and square roots of perfect square numbers. Students solve problems involving addition and subtraction of integers. They use all 4 operations in calculations involving positive fractions and decimals, choosing efficient calculation strategies. Students choose between equivalent representations of rational numbers and percentages to assist in calculations. They use mathematical modelling to solve practical problems involving rational numbers, percentages and ratios, in financial and other applied contexts, justifying choices of representation. Students use algebraic expressions to represent situations, describe the relationships between variables from authentic data and substitute values into formulas to determine unknown values. They solve linear equations with natural number solutions. Students create tables of values related to algebraic expressions and formulas, and describe the effect of variation. They apply knowledge of angle relationships and the sum of angles in a triangle to solve problems, giving reasons. Students use formulas for the areas of triangles and parallelograms and the volumes of rectangular and triangular prisms to solve problems. They describe the relationships between the radius, diameter and circumference of a circle. Students classify polygons according to their features and create an algorithm designed to sort and classify shapes. They represent objects two-dimensionally in different ways, describing the usefulness of these representations. Students use coordinates to describe transformations of points in the plane. They plan and conduct statistical investigations involving discrete and continuous numerical data, using appropriate displays. Students interpret data in terms of the shape of distribution and summary statistics, identifying possible outliers. They decide which measure of central tendency is most suitable and explain their reasoning. Students list sample spaces for single step experiments, assign probabilities to outcomes and predict relative frequencies for related events. They conduct repeated single-step chance experiments and run simulations using digital tools, giving reasons for differences between predicted and observed results.
Moderation	Calibration: Refer to QCAA moderation advice on the QCAA website under the Assessment tab in the learning area.	Consensus: Refer to QCAA moderation advice on the QCAA website under the Assessment tab in the learning area.	Expert: Refer to QCAA moderation advice on the QCAA website under the Assessment tab in the learning area.	Calibration: Refer to QCAA moderation advice on the QCAA website under the Assessment tab in the learning area.

Content descriptions	Units				Content descriptions	Units				Content descriptions	Units			
Number	**1**	**2**	**3**	**4**	**Algebra**	**1**	**2**	**3**	**4**	**Measurement**	**1**	**2**	**3**	**4**
describe the relationship between perfect square numbers and square roots, and use squares of numbers and square roots of perfect square numbers to solve problems AC9M7N01	☑	☐	☐	☐	recognise and use variables to represent everyday formulas algebraically and substitute values into formulas to determine an unknown AC9M7A01	☐	☐	☑	☐	solve problems involving the area of triangles and parallelograms using established formulas and appropriate units AC9M7M01	☐	☑	☐	☐
represent natural numbers as products of powers of prime numbers using exponent notation AC9M7N02	☑	☐	☐	☐	formulate algebraic expressions using constants, variables, operations and brackets AC9M7A02	☐	☐	☑	☐	solve problems involving the volume of right prisms including rectangular and triangular prisms, using established formulas and appropriate units AC9M7M02	☐	☑	☐	☐
represent natural numbers in expanded notation using place value and powers of 10 AC9M7N03	☑	☐	☐	☐	solve one-variable linear equations with natural number solutions; verify the solution by substitution AC9M7A03	☐	☐	☑	☐	describe the relationship between ππ and the features of circles including the circumference, radius and diameter AC9M7M03	☐	☑	☐	☐
find equivalent representations of rational numbers and represent rational numbers on a number line AC9M7N04	☐	☑	☐	☐	describe relationships between variables represented in graphs of functions from authentic data AC9M7A04	☐	☐	☑	☐	identify corresponding, alternate and co interior relationships between angles formed when parallel lines are crossed by a transversal; use them to solve problems and explain reasons AC9M7M04	☐	☑	☐	☐
round decimals to a given accuracy appropriate to the context and use appropriate rounding and estimation to check the reasonableness of solutions AC9M7N05	☐	☑	☐	☐	generate tables of values from visually growing patterns or the rule of a function; describe and plot these relationships on the Cartesian plane AC9M7A05	☐	☐	☑	☐	demonstrate that the interior angle sum of a triangle in the plane is 180° and apply this to determine the interior angle sum of other shapes and the size of unknown angles AC9M7M05	☐	☑	☐	☐
use the 4 operations with positive rational numbers including fractions, decimals and percentages to solve problems using efficient calculation strategies AC9M7N06	☑	☐	☐	☐	manipulate formulas involving several variables using digital tools, and describe the effect of systematic variation in the values of the variables AC9M7A06	☐	☐	☑	☐	use mathematical modelling to solve practical problems involving ratios; formulate problems, interpret and communicate solutions in terms of the situation, justifying choices made about the representationAC9M7M06	☐	☑	☐	☐
compare, order and solve problems involving addition and subtraction of integers AC9M7N07	☑	☐	☐	☐										
recognise, represent and solve problems involving ratios AC9M7N08	☐	☑	☐	☐										
use mathematical modelling to solve practical problems, involving rational numbers and percentages, including financial contexts; formulate problems, choosing representations and efficient calculation strategies, using digital tools as appropriate; interpret and communicate solutions in terms of the situation, justifying choices made about the representation AC9M7N09	☐	☑	☐	☐										

Content descriptions	Units				Content descriptions	Units				Content descriptions	Units			
Space	**1**	**2**	**3**	**4**	**Statistics**	**1**	**2**	**3**	**4**	**Probability**	**1**	**2**	**3**	**4**
represent objects in 2 dimensions; discuss and reason about the advantages and disadvantages of different representations AC9M7SP01	☐	☐	☐	☑	acquire data sets for discrete and continuous numerical variables and calculate the range, median, mean and mode; make and justify decisions about which measures of central tendency provide useful insights into the nature of the distribution of data AC9M7ST01	☑	☐	☐	☐	identify the sample space for single-stage events; assign probabilities to the outcomes of these events and predict relative frequencies for related events AC9M7P01	☐	☐	☑	☐
classify triangles, quadrilaterals and other polygons according to their side and angle properties; identify and reason about relationships AC9M7SP02	☐	☐	☐	☑	create different types of numerical data displays including stem and leaf plots using software where appropriate; describe and compare the distribution of data, commenting on the shape, centre and spread including outliers and determining the range, median, mean and mode AC9M7ST02	☑	☐	☐	☐	conduct repeated chance experiments and run simulations with a large number of trials using digital tools; compare predictions about outcomes with observed results, explaining the differences AC9M7P02	☐	☐	☑	☐
describe transformations of a set of points using coordinates in the Cartesian plane, translations and reflections on an axis, and rotations about a given point AC9M7SP03	☐	☐	☐	☑	plan and conduct statistical investigations involving data for discrete and continuous numerical variables; analyse and interpret distributions of data and report findings in terms of shape and summary statistics AC9M7ST03	☑	☐	☐	☐					
design and create algorithms involving a sequence of steps and decisions that will sort and classify sets of shapes according to their attributes, and describe how the algorithms work AC9M7SP04	☐	☐	☐	☑										

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	☐	☐	☐	☐
Asia and Australia's engagement with Asia	☐	☐	☐	☐
Sustainability	☐	☐	☐	☐