Year 7 Mathematics Curriculum and assessment plan

Example

Level description	Context a						
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.	The Year 7 schools and Formative a						
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 	This plan h						
• use exponents and exponent notation to consolidate and formalise their understanding of representations of natural numbers, and use these to make conjectures involving natural	data colle						
numbers by experiment with the assistance of digital tools	• timing of						
 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 	 summative need to s 						
 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 	understar exploration						
 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 	electronic						
 extend their knowledge of angles to establish further relationships and apply these when solving measurement and spatial problems 	the learni						
• 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							





ACiQ v9.0

and cohort considerations

r 7 cohort join from a variety of feeder primary and participates in regular mathematics lessons. re and diagnostic assessment is used early in o identify areas needing support and targeted .

- has considered:
- ollected from transition interviews
- of NAPLAN in Term 1
- ative and formative data from Year 6 showing the o support measurement and fractional standings
- ation and use of digital tools (e.g. virtual materials, nic devices, simulation programs and dynamic etric software) in relevant contexts, which supports rning 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 —
Duration: 10 weeks	Duration: 10 weeks	Duration: 10 weeks	Duration:
Critical and creative thinking skills are essential skills needed for solving problems and data analysis. In this unit, students use those skills to break down complex information and problems into smaller and more manageable parts for analysis. Students then problem- solve more 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 represent natural numbers in expanded notation. Students continue to develop fluency when using efficient calculation strategies to solve problems involving addition and subtraction of integers and all 4 operations, including rational numbers. 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. Evidence of student learning is collected in an examination. The second phase of this unit focuses on developing critical and creative thinking skills to plan and conduct statistical investigations 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. amount of time spent playing a particular sport). Students create different types of numerical data displays, including stem and leaf plots, using digital tools. Using these data displays, students then describe and compare the distribution of data using summary statistics (e.g. shape, centre and spread, including outiliers) and central tendencies (i.e. mode, mean and median). They explore the ethical concepts tha	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, areas and volumes 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 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. Students use appropriate rounding and estimation strategies to check the reasonableness of solutions. 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 180°. Students further develop critical and creative thinking skills by identifying aspects of a problem and applying knowledge of angle relationships and the sum of angles in a triangle by using paper triangles and tearing to euclide using formulas for the areas of triangles and parallelograms and solving problems using formulas for the volume of rectangular and triangular prisms. Evidence of student learning is collected in an 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. Students develop the skills to formulate algebraic expressions and describe the relationship between variables to represent real-life situations, e.g. gardening problems using the area model and graphs of the relationship between area and cost of turf. 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 tiles and spreadsheets) to form linear growth patterns. These mathematical concepts are assessed through an-end of-term 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 die) 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 probability experiment and simulation project.	Spatial aw represent f and analys unit require and object and repress In the first describe h relationshin circumfere of circles with circumfere the diamet thinking sk used to pre In the secc according and descri and rotatio plane. Stud dimensiona e.g. viewpo Using exar disadvanta use compu- that sort ar and descri with an end

Shaping up and taking a different view

10 weeks

wareness requires individuals to visualise and t their surroundings to enable the manipulation ysis of shapes and objects to solve problems. This ires students to explore the attributes of shapes cts to make precise classifications, transformations esentations of shapes and objects.

st phase of this unit, students investigate and how pi (π) is the constant in the proportional hip between the radius, diameter and rence of a circle. They compare the circumference in relation to their diameter by drawing several ith a compass, using string to approximate the rence, and then comparing the lengths of string to eter of the circle. Students use critical and creative skills to explore how these relationships can be predict the approximate measurements of a circle.

cond phase of this unit, students classify polygons g to their features. They use coordinates to plot cribe the transformation (e.g. translation, reflection ion) of shapes (including polygons) on a Cartesian rudents then explore and represent threeonal objects in two-dimensional representations, points, nets, isometric and perspective drawings. amples, students discuss the advantages and tages of the different representations. Students putational thinking to design and create algorithms and classify shapes according to their attributes cribe how the algorithms work. The unit culminates and-of-term examination.

	Unit 1 — The power of numbers and statis	tics	Unit 2 — Let's be rational and look at all th	e angles	es Unit 3 — Represent and simulate real life				
	Assessment 1 — Examination	Term/ week	Assessment 3 — Project: Mathematical modelling	Term/ week	Assessment 5 — Examination	Term/ week	Assess compu		
Assessment	 Description: Students answer short response 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 mathematical modelling and problemsolving involving rational numbers. Technique: Examination Mode: Written Conditions: up to 70 minutes, plus 5 minutes perusal, under supervised conditions calculator not permitted 	Term 1 Week 5	 Description: Students apply their knowledge of ratio and percentages and use mathematical modelling to find a refreshment recipe that will yield a high profit at the school fete. In a proposal prepared for the Head of Year 7, students: provide reasons why their refreshment recipe should be selected use mathematical modelling to solve financial and other practical problems involving percentages and ratios formulate and solve the problem involving finding a fraction, decimal or percentage of a quantity use estimation to find approximate solutions to problems involving ratios and percentages justify choices. 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 short response questions focusing on: using algebraic expressions to represent situations describing the relationships between variables from authentic data substituting values into formulas to determine unknown values solving linear equations with natural number solutions 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	Descrip questio • descrifeatur • repre- differd • descrifeatur • classifeatur • creati shape • using transfiplane Techni Mode: • up to perus • super • calcur		
٩	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 statistical investigation exploring the hobbies and interests of their class members. Students develop two questions to investigate: one to gather discrete numerical data, and the other to gather continuous numerical data. Students represent and interpret the data using the shape of distribution and decide which measure of central tendency is most useful and why. 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 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 to solve problems 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 trials that increase in sample sizes by using simulations. They seek to show that the average of the results obtained becomes closer to the expected outcome as more trials are conducted. Technique: Project Mode: Written Conditions: issued in Week 8 and completed over 1 week (including 3 hours of class time) completed by end of Week 9 written responses up to 600 words 	Term 3 Week 9			

— Shaping up and taking a different	view
sment 7 — Examination: Involving Itational thinking	Term/ week
ption: Students answer short response ons focusing on:	Term 4 Week 8
ribing the relationships between the res of circles	
esenting objects two-dimensionally in ent ways	
ribing the usefulness of these esentations	
ifying polygons according to their res	
ing an algorithm to sort and classify es	
g coordinates to describe formations of points on a Cartesian e.	
i que: Examination Written	
ions:	
70 minutes, including 5 minutes sal	
rvised conditions	

ACiQ_v9.0

Achievement standard

Moderation

Unit 1 — The power of numbers and statistics

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.

Calibration: Refer to QCAA moderation advice on the QCAA website under the Assessment tab in the learning area.

Unit 2 — Let's be rational and look at all the angles Unit 3 — Represent and simulate real life

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.

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Expert:

Refer to QCAA moderation advice on the QCAA website under the Assessment tab in the learning area.

Consensus:

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Unit 4 — Shaping up and taking a different view

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.

Calibration:

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Content descriptions		Ur	nits		Content descriptions	Units			Units			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	V				formulate algebraic expressions using constants, variables, operations and brackets AC9M7A02			V		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			Ø		describe the relationship between π 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	V	Ø			describe relationships between variables represented in graphs of functions from authentic data AC9M7A04			V		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			V		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	Ø	V			manipulate formulas involving several variables using digital tools, and describe the effect of systematic variation in the values of the variables AC9M7A06			V		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	V																
recognise, represent and solve problems involving ratios AC9M7N08		V															
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		Ø															

Content descriptions		Un	iits		Content descriptions	Units		Units		Content descriptions Units Content descriptions		Content descriptions		Un	its	
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					dentify 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	V				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	and conduct statistical investigations involving a for discrete and continuous numerical ables; analyse and interpret distributions of data report findings in terms of shape and summary istics MATST03										
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	V	\checkmark	V	V		
Digital literacy	V					
Ethical understanding	V					
Intercultural understanding						
Literacy						
Numeracy	V			V		
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								

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