Year 4 Mathematics Curriculum and assessment plan

Example

Level description	Context a
In Year 4, 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 4 learning. T • summati
 draw on their proficiency with number facts, fractions and decimals to deepen their appreciation of how numbers work develop and use strategies for multiplication that are based on their understanding of multiplication as an operation and their knowledge of laws for arithmetic operations 	explorati
 choose and use efficient strategies when modelling problems, communicating their solutions within the context of the situation use algorithms to generate sets of numbers, recognising and describing any patterns that emerge 	software
 become aware of the importance of context and purpose when they make judgements and reflect on the reasonableness of measurements and the results of calculations, and how they choose to represent mathematics and mathematical information 	Across the create auth provides a
 measure and estimate common attributes of objects using conventional instruments and appropriate metric units 	to the Hum
 develop and use surveys to obtain data that is directly relevant to their statistical investigations 	event as th
 draw on their reasoning skills to analyse, categorise and order chance events and identify independent and dependent events 	
 investigate variability by conducting repeated chance experiments and observing results. 	



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and cohort considerations

r 4 cohort participates in daily mathematics This plan has considered:

ative and formative data from Year 3 showing the o support and extend on students' emerging ning and fractional understandings

ation and use of digital tools (e.g. virtual material, nic devices, programs and dynamic geometric re) in relevant contexts, which supports the g and doing of mathematics.

he year, the contexts for teaching and learning uthentic learning experiences for students. Unit 3 an opportunity to connect statistical investigations umanities and Social Sciences (HASS) learning it 4 provides an opportunity to use an end-of-year the context for learning.



Unit 1 — What is the pattern?	Unit 2 — How do we use fractions to find solutions?	Unit 3 — Why do we measure?	Unit 4 —
Duration: 10 weeks	Duration: 10 weeks	Duration: 10 weeks	Duration
Understanding patterns and functions is an important mathematical skill, as identifying elements and relationships within a concept or problem supports critical and creative thinking skills. This unit provides opportunity for students to engage in pattern and function investigations across multiple contexts, where they make connections between different pieces of information, make predictions and draw conclusions based on evidence. In the first phase of this unit, students revise Number and Algebra concepts from Year 3 by exploring patterns in a range of contexts. They review skip counting of known facts and investigate conditions for a number to be odd or even. Through practical investigations with physical materials, students explain and use the properties of odd and even numbers, e.g. explaining why some materials can be evenly shared between two and others cannot, or using diagrams, arrays and skip counting to explain even numbers. Students develop critical and creative thinking skills as they analyse pattern structures and functions, identifying the relationships within pattern structures and predict and describe emerging patterns. Using their knowledge of the properties of numbers and operations, students apply these strategies to find unknown values in numerical equations involving addition and subtraction. Students then apply their understandings in a project where they use the computational thinking process and the properties of odd and even numbers to follow and create algorithms that generate sets of numbers. They use the properties of odd and even numbers to check the reasonableness of responses when finding unknown values in simple equations. Throughout the project, students show their findings from their patterning investigations. In the second phase of this unit, students transfer their knowledge from patterning with numbers to investigate patterns and symmetry. They investigate angles and compare them to a right angle. Students apply their understandings to create symmetrical patterns or picture	Fractions help students understand how a whole can be divided into equal parts. This knowledge relates to proportion, relationships between different parts and understanding how to break problems into smaller, more manageable parts to find solutions. In this unit, students deepen their fractional understandings, make connections between different representations and apply understandings to measurement and probability contexts. In the first phase of this unit, students build on fractional understandings from Year 3 where they represented unit fractions and their multiples. They extend on their understandings to include mixed numerals using physical materials, collections, pictures, diagrams and symbols to represent fractions in a variety of ways. Students then count and represent fractions, including mixed numerals, on a number line in whole class and small-group contexts. Through guided learning experiences with physical materials and paper folding, students recognise equivalent fractions in fraction families. They create models using collections of materials and manipulatives, making connection to the verbal and symbolic written form. Students deepen their understanding by exploring models of equivalent fractions in measurement contexts, e.g. three Y4 cups are equal to one 3⁄c cup. Students continue to apply fractional understandings when they use scaled instruments to solve problems involving mass and capacity. Evidence of student learning experiences and game play, students apply this knowledge to identify and describe the outcomes and the likelihood of everyday events or outcomes in terms of likelihood, regulast likely, most likely. Through hands-on learning experiences and game play, students apply this knowledge to identify independent or dependent results and conduct repeated chance experiments involving coins, dice and a variety of spinners. Critical and creative thinking skills are deepened when students identify and evaluate information to describe variability in results. Students present their findin	Measurement encourages critical and creative thinking skills as children estimate, compare and evaluate quantities. It helps them make informed decisions based on their understanding of size, quantity and dimensions of objects. In this unit, students build on their fractional understandings from Unit 2 and apply this in measurement contexts. They also continue to develop and use appropriate mathematical language. In the first phase of this unit, students use physical and visual representations to extend their understanding of the place value system. Referring back to patterns and structures from Unit 1, students review the pattern and structures of the place value system (based on powers of ten). Using this knowledge, students multiply natural numbers by multiples of ten and represent tenths and hundredths with physical and visual representations and diagrams. Through discussion, paper folding and visual models, students are then supported to make the connection between fraction and decimal notation. Students deepen and apply understandings of place value and decimal notation to investigate measurement contexts. Critical and creative thinking skills are encouraged as students develop questions on why measuring is important. Students use scaled instruments to investigate measurement situations and seek solutions to questions posed. They record measures of length and temperature in whole and part units. They also measure the perimeter and area of shapes and enclosed spaces, using fractional parts and whole units. Evidence of student learning will be collected through a supervised assessment. In the second phase of the unit, students continue to explore measurement through a statistical investigation focused on the inquiry question, "MA is the relationship between rainfall and temperature for different locations across Australia?' This assessment provides an opportunity to connect to Year 4 Humanities and Social Sciences learning area content. Students create many-to-one pictographs and column graphs and use digit	Engaging thinking s informatio communic mathemat solutions. In the first Number k and practi activities f modelling and numb involving f relationsh strategies recall and up to 10 × counters, doubling, Students estimation strategies Evidence In the sec problems units of tir calculate draw on th when calculate directions In their pr between u location o the grid re describe p event, e.g record evi journal.

- How can we model the problem?

n: 10 weeks

g in problem-solving situations nurtures critical skills and allows students to identify relevant on, employ strategies and draw conclusions to icate their findings. In this unit, students use atical models to comprehend problems and find

phase of this unit, students draw on their nowledge from previous units to model financial ical problems. Students engage in a range of to develop confidence with the mathematical process by using physical materials, diagrams per sentences. They develop efficient strategies the four operations, e.g. partitioning, inverse ips, compatible numbers, jump strategies, split compensate strategies, bridging tens. They demonstrate proficiency with multiplication facts 10 and related division facts using arrays, grid paper, diagrams to record strategies, e.g. halving, commutativity, using a known fact. then apply their understandings and skills in a nere they plan an end-of-year event with invited hey calculate the quantity of biscuit packets o host a morning tea and calculate the total cost. use their proficiency with number facts and n to calculate efficiently and use rounding to determine the reasonableness of results. is recorded in a learning journal.

cond phase of this unit, students solve practical is involving time duration. They convert between ime, using 'am' and 'pm' appropriately, and the amount of time between events. Students the fractional understandings from Units 2 and 3 culating time durations. Students also create and grid references and use them to locate and positions. They practise giving and following s in small groups.

roject, students create a schedule and convert units of time. Students also create a map of the of their event in their school environment, including references. They write directions for guests and positions and pathways from locations to the g. the classroom, office, hall, carpark. Students vidence of their thinking and solutions in a learning

	Unit 1 — What is the pattern?		Unit 2 — How do we use fractions to find solutions?		Unit 3 — Why do we measure?		Unit 4 — How can we model the problem?	
	Assessment 1 — Project: Computational thinking	Term/ week	Assessment 3 — Supervised assessment	Term/ week	Assessment 5 — Supervised assessment	Term/ week	Assessment 7 — Project: Mathematical modelling	Term/ week
	Description: In response to questions, students investigate numerical patterns where they use computational thinking to find solutions. Students sequence steps, finding unknown values in numerical equations involving addition and subtraction. They follow and create algorithms to explore the properties of odd and even numbers and identify emerging patterns, e.g. odd + odd = even, odd × odd = odd. Technique: Project Mode: Written Conditions: • completed over multiple lessons in Week 4	Term 1 Week 4	 Description: Under supervised conditions, through practical hands-on demonstrations and short written responses, students demonstrate their proficiency when: counting and representing fractions on a number line recognising equivalent fractions using scaled instruments and appropriate units to measure mass and capacity. Technique: Supervised assessment Mode: Written and practical (using scaled instruments to measure mass and capacity) Conditions: up to 40 minutes, plus 5 minutes perusal, planning and/or teacher instruction time may be completed over multiple lessons or broken into components in Week 5 practical responses are observed by the teacher 	Term 2 Week 5	 Description: Students respond to questions, scenarios, or problems that involve: using their understanding of place value to represent tenths and hundredths in decimal form and to multiply natural numbers by multiples of 10 making connections between fraction and decimal notations in number and measurement contexts using scaled instruments and appropriate units to measure length and temperature measuring and approximating perimeters and areas. Technique: Supervised assessment Mode: Written and practical (using scaled instruments to measure length) Conditions: up to 40 minutes, plus 5 minutes perusal, planning and/or teacher instruction time may be completed over multiple lessons or broken into components in Week 6 	Term 3 Week 6	 Description: In a learning journal, students record responses to a series of questions relating to an end-of-year event. Students demonstrate their proficiency in their learning journal when: using the mathematical modelling process to formulate and calculate quantities and catering costs for biscuits at morning tea representing the situation with number sentences, diagrams and arrays and providing a short, written explanation of their findings planning a timetable for their event and calculating time durations using grid references to map the school environment and providing written directions to help invited guests navigate the school. Technique: Project Mode: Written Conditions: completed over multiple lessons in Week 7 written responses up to 200 words 	Term 4 Week 7
ASSessment	 Assessment 2 — Project Description: Students explore spatial and measurement contexts to create physical or virtual representations of their pattern findings, sharing their understandings through a spoken presentation using multimedia. In the presentation students share: representations and approximations of shapes and objects in the environment angle comparisons relative to a right angle (using their names) identification of line and rotational symmetry in plane shapes creation of symmetrical patterns. Technique: Project Mode: Multimodal (using multimedia) Conditions: started in Week 6 and completed over multiple lessons with presentations completed by the end of Week 8 spoken/signed or multimodal responses up to 1 minute 	Term 1 Week 8	 Assessment 4 — Project: Probability experiment and simulations Description: Students conduct a probability experiment to investigate the likelihood of an event occurring. They present their findings in an investigation report that focuses on: conducting repeated chance experiments ordering events/outcomes of the chance experiments in terms of likelihood identifying whether events are independent or dependent describing the variation in results. Technique: Project Mode: Multimodal (written and practical with materials to conduct chance experiments) Conditions: completed over multiple lessons in Week 7 practical responses are observed by the teacher 	Term 2 Week 7	 Assessment 6 — Project: Statistical investigation Description: Students explore categorical and discrete numerical data through statistical investigations in response to the inquiry question, 'What is the relationship between rainfall and temperature for different locations across Australia?' Students create many-to-one data displays, assess the suitability of displays for representing data and discuss the shape of distributions and variation in data. They interpret results and communicate findings. Students use digital tools where appropriate. Technique: Project Mode: Written (using digital tools to create data representations) Conditions: started in Week 8 and completed over multiple lessons by end of Week 9 	Term 3 Week 9		

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Unit 1 -	- What is	the pattern
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Unit 2 — How do we use fractions to find solutions?

Unit 3 — Why do we measure?

on Achievement standard	solve triancial and other practical problems, formulating the problem using number sentences, solving the problem choosing efficient strategies and interpreting results in terms of the situation. Students use their proficiency with addition and multiplication facts to add and subtract, multiply and divide numbers efficiently. They choose rounding and estimation strategies to determine whether results of calculations are reasonable. Students use the properties of odd and even numbers. They recognise equivalent fractions and make connections between fraction and decimal notations. Students count and represent fractions on a number line. They find unknown values in numerical equations involving addition and subtraction. Students follow and create algorithms that generate sets of numbers and identify emerging patterns. They use scaled instruments and appropriate units to measure length, mass, capacity and temperature. Students measure and approximate perimeters and areas. They convert between units of time when solving problems involving duration. <u>Students compare angles</u> relative to a right angle using angle names. They represent and approximate shapes and objects in the environment. Students create and interpret grid references. They identify line and rotational symmetry in plane shapes and create symmetrical patterns. Students create many-to-one data displays, assess the suitability of displays for representing data and discuss the shape of distributions and variation in data. They use surveys and digital tools to generate categorical or discrete numerical data in statistical investigations and communicate their findings in context. Students order events or the outcomes of chance experiments in terms of likelihood and identify whether events are independent or dependent. They conduct repeated chance experiments and describe the variation in results.	solve thancial and other practical problems, formulating the problem using number sentences, solving the problem choosing efficient strategies and interpreting results in terms of the situation. Students use their proficiency with addition and multiplication facts to add and subtract, multiply and divide numbers efficiently. They choose rounding and estimation strategies to determine whether results of calculations are reasonable. Students use the properties of odd and even numbers. They recognise equivalent fractions and make connections between fraction and decimal notations. Students count and represent fractions on a number line. They find unknown values in numerical equations involving addition and subtraction. Students follow and create algorithms that generate sets of numbers and identify emerging patterns. They use scaled instruments and appropriate units to measure length, mass, capacity and temperature. Students measure and approximate perimeters and areas. They convert between units of time when solving problems involving duration. Students compare angles relative to a right angle using angle names. They represent and approximate shapes and objects in the environment. Students create and interpret grid references. They identify line and rotational symmetry in plane shapes and create symmetrical patterns. Students create many-to-one data displays, assess the suitability of displays for representing data and discuss the shape of distributions and variation in data. They use surveys and digital tools to generate categorical or discrete numerical data in statistical investigations and communicate their findings in context. <u>Students order</u> events or the outcomes of chance experiments in terms of likelihood and identify whether events are independent or dependent. They conduct repeated chance experiments and describe the variation in results.	
Moderatio	Refer to QCAA moderation advice on the QCAA website under the Assessment tab in the learning area.	Refer to QCAA moderation advice on the QCAA website under the Assessment tab in the learning area.	F l

By the end of Year 4, students use their understanding of place value to represent tenths and hundredths in decimal form and to multiply natural numbers by multiples of 10. They use mathematical modelling to solve financial and other practical problems, formulating the problem using number sentences, solving the problem choosing efficient strategies and interpreting results in terms of the situation. Students use their proficiency with addition and multiplication facts to add and subtract, multiply and divide numbers efficiently. They choose rounding and estimation strategies to determine whether results of calculations are reasonable. Students use the properties of odd and even numbers. They recognise equivalent fractions and make connections between fraction and decimal notations. Students count and represent fractions on a number line. They find unknown values in numerical equations involving addition and subtraction. Students follow and create algorithms that generate sets of numbers and identify emerging patterns.

They use scaled instruments and appropriate units to measure length, mass, capacity and temperature. Students measure and approximate perimeters and areas. They convert between units of time when solving problems involving duration. Students compare angles relative to a right angle using angle names. They represent and approximate shapes and objects in the environment. Students create and interpret grid references. They identify line and rotational symmetry in plane shapes and create symmetrical patterns.

Students create many-to-one data displays, assess the suitability of displays for representing data and discuss the shape of distributions and variation in data. They use surveys and digital tools to generate categorical or discrete numerical data in statistical investigations and communicate their findings in context. Students order events or the outcomes of chance experiments in terms of likelihood and identify whether events are independent or dependent. They conduct repeated chance experiments and describe the variation in results.

Calibration:

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

By the end of Year 4, students use their understanding of place value to represent tenths and hundredths in decimal form and to multiply natural numbers by multiples of 10. They use mathematical modelling to solve financial and other practical problems, formulating the problem using number sentences, solving the problem choosing efficient strategies and interpreting results in terms of the situation. Students use their proficiency with addition and multiplication facts to add and subtract, multiply and divide numbers efficiently. They choose rounding and estimation strategies to determine whether results of calculations are reasonable. Students use the properties of odd and even numbers. They recognise equivalent fractions and make connections between fraction and decimal notations. Students count and represent fractions on a number line. They find unknown values in numerical equations involving addition and subtraction. Students follow and create algorithms that generate sets of numbers and identify emerging patterns. They use scaled instruments and appropriate units to measure length, mass, capacity and temperature. Students measure and approximate perimeters and areas. They convert between units of time when solving problems involving duration. Students compare angles

relative to a right angle using angle names. They represent and approximate shapes and objects in the environment. Students create and interpret grid references. They identify line and rotational symmetry in plane shapes and create symmetrical patterns. Students create many-to-one data displays, assess the suitability of displays for representing data and discuss

Consensus:

Year 4 Mathematics curriculum and assessment plan Example

Unit 4 — How can we model the problem?

the shape of distributions and variation in data. They use surveys and digital tools to generate categorical or discrete numerical data in statistical investigations and communicate their findings in context. Students order events or the outcomes of chance experiments in terms of likelihood and identify whether events are independent or dependent. They conduct repeated chance experiments and describe the variation in results.

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

Content descriptions		Units			Content descriptions		Ur	nits		Content descriptions		
Number	1	2	3	4	Algebra	1	2	3	4	Measurement		
recognise and extend the application of place value to tenths and hundredths and use the conventions of decimal notation to name and represent decimals AC9M4N01					find unknown values in numerical equations involving addition and subtraction, using the properties of numbers and operations AC9M4A01					interpret unmarked and partial measuring and comparing attri capacity, duration and tempera and digital instruments and ap AC9M4M01		
explain and use the properties of odd and even numbers AC9M4N02					recall and demonstrate proficiency with multiplication facts up to 10 x 10 and related division facts; extend and apply facts to develop efficient mental strategies for computation with larger numbers without a calculator AC9M4A02					recognise ways of measuring a perimeter and area of shapes using appropriate formal and ir AC9M4M02		
find equivalent representations of fractions using related denominators and make connections between fractions and decimal notation AC9M4N03										solve problems involving the d including situations involving "a conversions between units of t AC9M4M03		
count by fractions including mixed numerals; locate and represent these fractions as numbers on number lines AC9M4N04		V								estimate and compare angles including acute, obtuse, straigh revolution, and recognise their angle AC9M4M04		
solve problems involving multiplying or dividing natural numbers by multiples and powers of 10 without a calculator, using the multiplicative relationship between the place value of digits AC9M4N05												
develop efficient strategies and use appropriate digital tools for solving problems involving addition and subtraction, and multiplication and division where there is no remainder AC9M4N06				Ø								
choose and use estimation and rounding to check and explain the reasonableness of calculations including the results of financial transactions AC9M4N07												
use mathematical modelling to solve practical problems involving additive and multiplicative situations including financial contexts; formulate the problems using number sentences and choose efficient calculation strategies, using digital tools where appropriate; interpret and communicate solutions in terms of the situation AC9M4N08												
follow and create algorithms involving a sequence of steps and decisions that use addition or multiplication to generate sets of numbers; identify and describe any emerging patterns AC9M4N09												

	Units						
	1	2	3	4			
tial units when attributes of length, mass, perature, using scaled appropriate units		V					
ng and approximating the es and enclosed spaces, nd informal units			V				
e duration of time g "am" and "pm" and of time				V			
les using angle names aight angle, reflex and neir relationship to a right							

Content descriptions		Units			Content descriptions	Units		ts Content descriptions			Units			
Space	1	2	3	4	Statistics	1	2	3	4	Probability	1	2	3	4
represent and approximate composite shapes and objects in the environment, using combinations of familiar shapes and objects AC9M4SP01	V				acquire data for categorical and discrete numerical variables to address a question of interest or purpose, using digital tools; represent data using many-to-one pictographs, column graphs and other displays or visualisations; interpret and discuss the information that has been created AC9M4ST01			V		describe possible everyday events and the possible outcomes of chance experiments and order outcomes or events based on their likelihood of occurring; identify independent or dependent events AC9M4P01		V		
create and interpret grid reference systems using grid references and directions to locate and describe positions and pathways AC9M4SP02					analyse the effectiveness of different displays or visualisations in illustrating and comparing data distributions, then discuss the shape of distributions and the variation in the data AC9M4ST02			V		conduct repeated chance experiments to observe relationships between outcomes; identify and describe the variation in results AC9M4P02		Ø		
recognise line and rotational symmetry of shapes and create symmetrical patterns and pictures, using dynamic geometric software where appropriate AC9M4SP03	Ø				conduct statistical investigations, collecting data through survey responses and other methods; record and display data using digital tools; interpret the data and communicate the results AC9M4ST03			V						

General capabilities	Units				
	1	2	3	4	
Critical and creative thinking	V	\checkmark	\checkmark	V	
Digital literacy	V		\checkmark		
Ethical understanding					
Intercultural understanding					
Literacy		\checkmark			
Numeracy	V	V	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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