Year 3 standard elaborations — Australian Curriculum v9.0: Mathematics

ACiQ | v9.0

Purpose

The standards elaborations (SEs) have been designed to support teachers to connect curriculum to evidence in assessment so that students are assessed on what they have had the opportunity to learn. The SEs can be used to:

- make consistent and comparable judgments, on a five-point scale, about the evidence of learning in a folio of student work across a year/band
- develop task-specific standards (or marking guides) for individual assessment tasks
- quality assure planning documents to ensure coverage of the achievement standard across a year/band.

Structure

The SEs have been developed using the Australian Curriculum achievement standard. The achievement standard for Mathematics describes what students are expected to know and be able to do at the end of each year. Teachers use the SEs to inform the development of assessment tasks and to make on-balance judgments about the qualities in student work that demonstrate the depth and breadth of their learning.

In Queensland, the achievement standard represents the C standard — a sound level of knowledge and understanding of the content, and application of skills. The SEs are presented in a matrix where the discernible differences and/or degrees of quality between each performance level are highlighted. Teachers match these discernible differences and/or degrees of quality to characteristics of student work to make judgments across a five-point scale. Terms are described in the Notes section following the matrix.

Year 3 Australian Curriculum: Mathematics achievement standard

By the end of Year 3, students order and represent natural numbers beyond 10 000. They partition, rearrange and regroup two- and three-digit numbers in different ways to assist in calculations. Students extend and use single-digit addition and related subtraction facts and apply additive strategies to model and solve problems involving two- and three-digit numbers. They use mathematical modelling to solve practical problems involving single-digit multiplication and division, recalling multiplication facts for twos, threes, fours, fives and tens, and using a range of strategies. Students represent unit fractions and their multiples in different ways. They make estimates and determine the reasonableness of financial and other calculations. Students find unknown values in number sentences involving addition and subtraction. They create algorithms to investigate numbers and explore simple patterns.

Students use familiar metric units when estimating, comparing and measuring the attributes of objects and events. They identify angles as measures of turn and compare them to right angles. Students estimate and compare measures of duration using formal units of time. They represent money values in different ways. Students make, compare and classify objects using key features. They interpret and create two-dimensional representations of familiar environments.

Students conduct guided statistical investigations involving categorical and discrete numerical data, and interpret their results in terms of the context. They record, represent and compare data they have collected. Students use practical activities, observation or experiment to identify and describe outcomes and the likelihood of everyday events explaining reasoning. They conduct repeated chance experiments and discuss variation in results.

Source: Australian Curriculum, Assessment and Reporting Authority (ACARA), *Australian Curriculum Version 9.0 Mathematics for Foundation–10*
https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/year-3?view=quick&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0

Year 3 Mathematics standard elaborations

		A	B	C	D	E
		The folio of student work contains evidence of the following:				
Mathematical proficiencies	**Understanding**	• accurate and consistent identification, representation, description and connection of mathematical concepts and relationships • in complex unfamiliar, complex familiar, and simple familiar situations, identification, representation, description and connection of mathematical concepts and relationships	• accurate identification, representation, description and connection of mathematical concepts and relationships • in complex familiar and simple familiar situations, identification, representation, description and connection of mathematical concepts and relationships	• identification, representation, description and connection of mathematical concepts and relationships • in simple familiar situations, identification, representation, description and connection of mathematical concepts and relationships	• partial identification, representation and description of mathematical concepts and relationships • in some simple familiar situations, identification, representation, description and connection of mathematical concepts and relationships	• fragmented identification, representation and description of mathematical concepts and relationships • in isolated and obvious situations, identification, representation, description and connection of mathematical concepts and relationships
	Fluency	• choice, use and application of comprehensive facts, definitions, and procedures to find solutions • in complex unfamiliar, complex familiar, and simple familiar situations, choice, use and application of facts, definitions, and procedures to find solutions	• choice, use and application of effective facts, definitions, and procedures to find solutions • in complex familiar and simple familiar situations, choice, use and application of facts, definitions, and procedures to find solutions	• choice, use and application of facts, definitions, and procedures to find solutions • in simple familiar situations, choice, use and application of facts, definitions, and procedures to find solutions	• choice and use of partial facts, definitions, and procedures to find solutions • in some simple familiar situations, choice, use and application of facts, definitions, and procedures to find solutions	• choice and use of fragmented facts, definitions and procedures to find solutions • in isolated and obvious situations, choice, use and application of facts, definitions, and procedures to find solutions

		A	B	C	D	E
		The folio of student work contains evidence of the following:				
	Reasoning	• comprehensive explanation of mathematical thinking, strategies used, and conclusions reached • in complex unfamiliar, complex familiar, and simple familiar situations, explanation of mathematical thinking, strategies used, and conclusions reached	• detailed explanation of mathematical thinking, strategies used, and conclusions reached • in complex familiar and simple familiar situations, explanation of mathematical thinking, strategies used, and conclusions reached	• explanation of mathematical thinking, strategies used, and conclusions reached • in simple familiar situations, explanation of mathematical thinking, strategies used, and conclusions reached	• partial explanation of mathematical thinking, strategies used, and conclusions reached • in some simple familiar situations, explanation of mathematical thinking, strategies used, and conclusions reached	• fragmented explanation of mathematical thinking, strategies used, and conclusions reached • in isolated and obvious situations, explanation of mathematical thinking, strategies used, and conclusions reached
	Problem-solving	• purposeful use of problem-solving approaches to find solutions to problems.	• effective use of problem-solving approaches to find solutions to problems.	• use of problem-solving approaches to find solutions to problems.	• partial use of problem-solving approaches to make progress towards finding solutions to problems.	• fragmented use of problem-solving approaches to make progress towards finding solutions to problems.

Key	shading emphasises the qualities that discriminate between the A–E descriptors

Notes

The SEs for Mathematics are organised using the four Mathematical proficiencies, Understanding, Fluency, Reasoning and Problem-solving. The proficiencies represent the actions students demonstrate when working mathematically. The proficiencies are embedded as verbs in the achievement standard and related content descriptions.

Table 1 shows how aspects of the Australian Curriculum achievement standard can be demonstrated as evidence (at the C standard) and related to the proficiencies.

In the Mathematics SEs, there are two types of qualifiers to describe performance across the five-point scale: those describing degrees of quality, and those describing degrees of difficulty. Table 2 describes degrees of difficulty, in terms of the complexity and familiarity of situations.

Tables 1 and 2 should be used in conjunction with the ACARA Australian Curriculum Mathematics glossary: https://v9.australiancurriculum.edu.au/content/dam/en/curriculum/ac-version-9/downloads/mathematics/mathematics-glossary-v9.docx

Table 1: Relationship between Australian Curriculum achievement standard and Mathematical proficiencies

Aspect of the achievement standard	Related content description/s	Examples of evidence	Mathematical proficiencies
Students order and represent natural numbers beyond 10 000.	**Number** • recognise, represent and order natural numbers using naming and writing conventions for numerals beyond 10 000 AC9M3N01	• representing natural numbers beyond 10 000	Understanding
		• ordering natural numbers beyond 10 000	Fluency
They partition, rearrange and regroup two- and three-digit numbers in different ways to assist in calculations.	**Number** • add and subtract two- and three-digit numbers using place value to partition, rearrange and regroup numbers to assist in calculations without a calculator AC9M3N03 **Algebra** • recognise and explain the connection between addition and subtraction as inverse operations, apply to partition numbers and find unknown values in number sentences AC9M3A01 **Measurement** • recognise the relationships between dollars and cents and represent money values in different ways AC9M3M06	• partitioning, rearranging and regrouping two-digit numbers in different ways to assist in calculations • partitioning, rearranging and regrouping three-digit numbers in different ways to assist in calculations	Fluency

Aspect of the achievement standard	Related content description/s	Examples of evidence	Mathematical proficiencies
Students extend and use single-digit addition and related subtraction facts and apply additive strategies to model and solve problems involving two- and three-digit numbers.	**Number** • add and subtract two- and three-digit numbers using place value to partition, rearrange and regroup numbers to assist in calculations without a calculator AC9M3N03 • use mathematical modelling to solve practical problems involving additive and multiplicative situations including financial contexts; formulate problems using number sentences and choose calculation strategies, using digital tools where appropriate; interpret and communicate solutions in terms of the situation AC9M3N06 **Algebra** • extend and apply knowledge of addition and subtraction facts to 20 to develop efficient mental strategies for computation with larger numbers without a calculator AC9M3A02	• modelling problems involving two- and three-digit numbers	Understanding
		• solving problems involving two- and three- digit numbers by extending and using single-digit addition and related subtraction facts, and applying additive strategies	Fluency
They use mathematical modelling to solve practical problems involving single-digit multiplication and division, recalling multiplication facts for twos, threes, fours, fives and tens, and using a range of strategies.	**Number** • multiply and divide one- and two-digit numbers, representing problems using number sentences, diagrams and arrays, and using a variety of calculation strategies AC9M3N04 • use mathematical modelling to solve practical problems involving additive and multiplicative situations including financial contexts; formulate problems using number sentences and choose calculation strategies, using digital tools where appropriate; interpret and communicate solutions in terms of the situation AC9M3N06 **Algebra** • recall and demonstrate proficiency with multiplication	• solving practical problems involving single-digit multiplication and division, recalling multiplication facts for twos, threes, fours, fives and tens, using a range of strategies	Fluency
		• using mathematical modelling to solve practical problems	Problem-solving

Aspect of the achievement standard	Related content description/s	Examples of evidence	Mathematical proficiencies
	facts for 3, 4, 5 and 10; extend and apply facts to develop the related division facts AC9M3A03		
Students represent unit fractions and their multiples in different ways.	**Number** • recognise and represent unit fractions including $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$ and $\frac{1}{10}$ and their multiples in different ways; combine fractions with the same denominator to complete the whole AC9M3N02	• representing unit fractions and their multiples in different ways	Understanding
They make estimates and determine the reasonableness of financial and other calculations.	**Number** • estimate the quantity of objects in collections and make estimates when solving problems to determine the reasonableness of calculations AC9M3N05 • use mathematical modelling to solve practical problems involving additive and multiplicative situations including financial contexts; formulate problems using number sentences and choose calculation strategies, using digital tools where appropriate; interpret and communicate solutions in terms of the situation AC9M3N06 **Measurement** • identify which metric units are used to measure everyday items; use measurements of familiar items and known units to make estimates AC9M3M01 • recognise the relationships between dollars and cents and represent money values in different ways AC9M3M06	• making estimates to determine the reasonableness of financial and other calculations	Reasoning

Aspect of the achievement standard	Related content description/s	Examples of evidence	Mathematical proficiencies
Students find unknown values in number sentences involving addition and subtraction.	**Algebra** • recognise and explain the connection between addition and subtraction as inverse operations, apply to partition numbers and find unknown values in number sentences AC9M3A01	• finding unknown values in number sentences involving addition and subtraction	Fluency
They create algorithms to investigate numbers and explore simple patterns.	**Algebra** • follow and create algorithms involving a sequence of steps and decisions to investigate numbers; describe any emerging patterns AC9M3N07	• exploring simple patterns	Understanding
		• creating algorithms to investigate numbers	Problem-solving
Students use familiar metric units when estimating, comparing and measuring the attributes of objects and events.	**Measurement** • identify which metric units are used to measure everyday items; use measurements of familiar items and known units to make estimates AC9M3M01 • measure and compare objects using familiar metric units of length, mass and capacity, and instruments with labelled markings AC9M3M02 • recognise and use the relationship between formal units of time including days, hours, minutes and seconds to estimate and compare the duration of events AC9M3M03	• estimating and measuring the attributes of – objects – events using familiar metric units	Fluency
		• comparing attributes of – objects – events using familiar metric units	Reasoning
They identify angles as measures of turn and compare them to right angles.	**Measurement** • identify angles as measures of turn and compare angles with right angles in everyday situations AC9M3M05	• identifying angles as measures of turn	Understanding
		• comparing angles to right angles	Reasoning
Students estimate and compare measures of duration using formal units of time.	**Measurement** • recognise and use the relationship between formal units of time including days, hours, minutes and seconds to estimate and compare the duration of events AC9M3M03 • describe the relationship between the hours and minutes on analog and digital	• estimating measures of duration using formal units of time	Fluency
		• comparing measures of duration using formal units of time	Reasoning

Aspect of the achievement standard	Related content description/s	Examples of evidence	Mathematical proficiencies
	clocks, and read the time to the nearest minute AC9M3M04		
They represent money values in different ways.	**Measurement** • recognise the relationships between dollars and cents and represent money values in different ways AC9M3M06	• representing money values in different ways	Understanding
Students make, compare and classify objects using key features.	**Space** • make, compare and classify objects, identifying key features and explaining why these features make them suited to their uses AC9M3SP01	• making objects using key features	Understanding
		• classifying objects using key features	Fluency
		• comparing objects using key features	Reasoning
They interpret and create two-dimensional representations of familiar environments.	**Space** • interpret and create two dimensional representations of familiar environments, locating key landmarks and objects relative to each other AC9M3SP02	• interpreting two-dimensional representations of familiar environments • creating two-dimensional representations of familiar environments	Understanding
Students conduct guided statistical investigations involving categorical and discrete numerical data, and interpret their results in terms of the context.	**Statistic** • acquire data for categorical and discrete numerical variables to address a question of interest or purpose by observing, collecting and accessing data sets; record the data using appropriate methods including frequency tables and spreadsheets AC9M3ST01 • create and compare different graphical representations of data sets including using software where appropriate; interpret the data in terms of the context AC9M3ST02 • conduct guided statistical investigations involving the collection, representation and interpretation of data for categorical and discrete numerical variables with respect to questions of interest AC9M3ST03	• interpreting results from statistical investigations in terms of the context	Reasoning
		• conducting guided statistical investigations involving categorical and discrete numerical data	Problem-solving

Aspect of the achievement standard	Related content description/s	Examples of evidence	Mathematical proficiencies
They record, represent and compare data they have collected.	**Statistics** • acquire data for categorical and discrete numerical variables to address a question of interest or purpose by observing, collecting and accessing data sets; record the data using appropriate methods including frequency tables and spreadsheets AC9M3ST01 • create and compare different graphical representations of data sets including using software where appropriate; interpret the data in terms of the context AC9M3ST02	• representing collected data	Understanding
		• recording collected data	Fluency
		• comparing collected data	Reasoning
Students use practical activities, observation or experiment to identify and describe outcomes and the likelihood of everyday events explaining reasoning.	**Probability** • identify practical activities and everyday events involving chance; describe possible outcomes and events as 'likely' or 'unlikely' and identify some events as 'certain' or 'impossible' explaining reasoning AC9M3P01 • conduct repeated chance experiments; identify and describe possible outcomes, record the results, recognise and discuss the variation AC9M3P02	• identifying outcomes and the likelihood of everyday events • describing outcomes and the likelihood of everyday events	Understanding
		• using practical activities, observation or experiment	Fluency
		• explaining reasoning from practical activities, observations or experiments	Reasoning
They conduct repeated chance experiments and discuss variation in results.	**Probability** • conduct repeated chance experiments; identify and describe possible outcomes, record the results, recognise and discuss the variation AC9M3P02	• discussing variation in results from repeated chance experiments	Reasoning
		• conducting repeated chance experiments	Problem-solving

Table 2: Key terms used in Mathematics SEs

Term	Description
Simple familiar	In questions of this degree of difficulty, students respond to situations where: • relationships and interactions are obvious and have few elements; and • all of the information to solve the problem is identifiable, that is – the required procedure is clear from the way the problem is posed, or – in a context that has been a focus of prior learning. Students are not required to interpret, clarify and analyse problems to develop responses.
Complex familiar	In questions of this degree of difficulty, students respond to situations where: • relationships and interactions have a number of elements, such that connections are made with subject matter within and/or across the strands of mathematics; and • all of the information to solve the problem is identifiable, that is – the required procedure is clear from the way the problem is posed, or – in a context that has been a focus of prior learning. Some interpretation, clarification and analysis will be required to develop responses. Shifting the level of complexity may include making changes to the: • amount of scaffolding • number of steps required to solve the problem/situation • changes to increments, benchmarks or scales on axes • number of attributes considered.
Complex unfamiliar	In questions of this degree of difficulty, students respond to situations where: • relationships and interactions have a number of elements, such that connections are made with subject matter within and/or across the strands of mathematics; and • all the information to solve the problem is not immediately identifiable, that is – the required procedure is not clear from the way the problem is posed, and – in a context in which students have had limited prior experience. Students interpret, clarify and analyse problems to develop responses. Shifting the level of familiarity may include making changes to the: • context for application, e.g. financial, measurement, spatial or statistical • type of representation, e.g. physical, visual or symbolic • orientation of representation, e.g. horizontal or vertical • merge of subject matter/concepts from across different strands.