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

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 during and at the end of a teaching period to make on-balance judgments about the qualities in student work that demonstrate the depth and breadth of their learning.

The Mathematics SEs have been organised using the Mathematical proficiencies. Performance across the five-point scale is frequently described in terms of complexity and familiarity of the standards descriptor being assessed. Across the standards elaborations in Year 3 to Year 6, this is described using: A — unfamiliar, B — complex familiar, C — simple familiar, D — some simple familiar, E — isolated and obvious.

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.

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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

Note: The Mathematics SEs are organised by the Mathematical proficiencies. The proficiencies represent the actions students demonstrate when working mathematically. The proficiencies are embedded as verbs in the achievement standard and related content descriptions. For further information about the connections between the achievement standard aspects and the standard elaborations see Table 1 on page 4.

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 unfamiliar, complex familiar, and simple familiar situations	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 in simple familiar situations	partial identification, representation and description of mathematical concepts and relationships in some simple familiar situations	fragmented identification, representation and description of mathematical concepts and relationships in isolated and obvious situations
	Fluency	choice, use and application of comprehensive facts, definitions, and procedures to find solutions in unfamiliar, complex familiar, and simple familiar situations	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 in simple familiar situations	choice and use of partial facts, definitions, and procedures to find solutions in some simple familiar situations	choice and use of fragmented facts, definitions and procedures to find solutions in isolated and obvious situations
	Reasoning	comprehensive explanation of mathematical thinking, strategies used, and conclusions reached in unfamiliar, complex familiar, and simple familiar situations	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 in simple familiar situations	partial explanation of mathematical thinking, strategies used, and conclusions reached in some simple familiar situations	fragmented explanation of mathematical thinking, strategies used, and conclusions reached in isolated and obvious situations
	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 Mathematical proficiencies. The Mathematical proficiencies include Understanding, Fluency, Reasoning and Problem-solving. The Mathematical proficiencies represent the valued features or assessable elements.

For a specific assessment task, the standard elaborations description (in the previous table) can be modified to include task-specific content. Task-specific content can be drawn from an aspect of the achievement standard and the related content description/s which are aligned to the Mathematical proficiencies being assessed. Table 1 provides examples of how content can be related to the standard elaborations valued features for task-specific marking guides at a C standard.

Table 2 helps clarify key terms from the standard descriptors in the Mathematics SEs and 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: Examples of how content can be related to the SE valued features for task-specific marking guides at a C standard

Aspect of the achievement standard	Related content description/s	SE valued features (Mathematical proficiencies)	Examples of how content can be related to the SE valued features
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	Understanding	• representing natural numbers beyond 10 000
		Fluency	• ordering natural numbers beyond 10 000
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	Fluency	• 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

Aspect of the achievement standard	Related content description/s	SE valued features (Mathematical proficiencies)	Examples of how content can be related to the SE valued features
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	Understanding	• modelling problems involving two- and three-digit numbers
		Fluency	• solving problems involving two- and three- digit numbers by extending and using single-digit addition and related subtraction facts, and applying additive strategies

Aspect of the achievement standard	Related content description/s	SE valued features (Mathematical proficiencies)	Examples of how content can be related to the SE valued features
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 facts for 3, 4, 5, 3, 4, 5 and 10; extend and apply facts to develop the related division facts AC9M3A03	Fluency	• solving practical problems involving single-digit multiplication and division, recalling multiplication facts for twos, threes, fours, fives and tens, using a range of strategies
		Problem-solving	• using mathematical modelling to solve practical problems
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	Understanding	• representing unit fractions and their multiples in different ways

Aspect of the achievement standard	Related content description/s	SE valued features (Mathematical proficiencies)	Examples of how content can be related to the SE valued features
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	Reasoning	• making estimates to determine the reasonableness of financial and other calculations
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	Fluency	• finding unknown values in number sentences involving addition and subtraction
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	Understanding	• exploring simple patterns
		Problem-solving	• creating algorithms to investigate numbers

Aspect of the achievement standard	Related content description/s	SE valued features (Mathematical proficiencies)	Examples of how content can be related to the SE valued features

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
		Fluency	• estimating and measuring the attributes of
			  – objects
			  – events
			using familiar metric units

		Reasoning	• comparing attributes of
			  – objects
			  – events
			using familiar metric units

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	Understanding	• identifying angles as measures of turn
		Reasoning	• comparing angles to right angles
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 clocks, and read the time to the nearest minute AC9M3M04	Fluency	• estimating measures of duration using formal units of time
		Reasoning	• comparing measures of duration using formal units of time
They represent money values in different ways.	**Measurement** • recognise the relationships between dollars and cents and represent money values in different ways AC9M3M06	Understanding	• representing money values in different ways

Aspect of the achievement standard	Related content description/s	SE valued features (Mathematical proficiencies)	Examples of how content can be related to the SE valued features
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	Understanding	• making objects using key features
		Fluency	• classifying objects using key features
		Reasoning	• comparing objects using key features
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	Understanding	• creating two-dimensional representations of familiar environments
		Reasoning	• interpreting 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.	**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	Reasoning	• interpreting results from statistical investigations in terms of the context
		Problem-solving	• conducting guided statistical investigations involving categorical and discrete numerical data
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	Understanding	• representing collected data
		Fluency	• recording collected data

Aspect of the achievement standard	Related content description/s	SE valued features (Mathematical proficiencies)	Examples of how content can be related to the SE valued features
	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	Reasoning	• comparing collected data
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	Understanding	• identifying outcomes and the likelihood of everyday events • describing outcomes and the likelihood of everyday events
		Fluency	• using practical activities, observation or experiment
		Reasoning	• explaining reasoning from practical activities, observations or experiments
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	Reasoning	• discussing variation in results from repeated chance experiments
		Problem-solving	• conducting repeated chance experiments

Table 2: Key terms used in Mathematics SEs

Term	Description

Simple familiar	Problems of this degree of difficulty require students to demonstrate knowledge and understanding of the subject matter and application of skills in a situation 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	Problems of this degree of difficulty require students to demonstrate knowledge and understanding of the subject matter and application of skills in a situation 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.
	Creating complex familiar examples may consist in making changes to any of the following, including the:
	• number of steps required to solve the problem/situation
	• changes to increments, benchmarks or scale
	• number of attributes considered.

Unfamiliar	Problems of this degree of difficulty require students to demonstrate knowledge and understanding of the subject matter and application of skills in a situation 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.
	Creating unfamiliar examples may consist in making changes to any of the following, including 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.