

# Year 7 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 7 to Year 10, this is described using: A — complex 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.



### Year 7 Australian Curriculum: Mathematics achievement standard

By the end of Year 7, students represent natural numbers in expanded form and as products of prime factors, using exponent notation. They solve problems involving squares of numbers and square roots of perfect square numbers. Students solve problems involving addition and subtraction of integers. They use all 4 operations in calculations involving positive fractions and decimals, choosing efficient calculation strategies. Students choose between equivalent representations of rational numbers and percentages to assist in calculations. They use mathematical modelling to solve practical problems involving rational numbers, percentages and ratios, in financial and other applied contexts, justifying choices of representation. Students use algebraic expressions to represent situations, describe the relationships between variables from authentic data and substitute values into formulas to determine unknown values. They solve linear equations with natural number solutions. Students create tables of values related to algebraic expressions and formulas, and describe the effect of variation.

They apply knowledge of angle relationships and the sum of angles in a triangle to solve problems, giving reasons. Students use formulas for the areas of triangles and parallelograms and the volumes of rectangular and triangular prisms to solve problems. They describe the relationships between the radius, diameter and circumference of a circle. Students classify polygons according to their features and create an algorithm designed to sort and classify shapes. They represent objects two-dimensionally in different ways, describing the usefulness of these representations. Students use coordinates to describe transformations of points in the plane.

They plan and conduct statistical investigations involving discrete and continuous numerical data, using appropriate displays. Students interpret data in terms of the shape of distribution and summary statistics, identifying possible outliers. They decide which measure of central tendency is most suitable and explain their reasoning. Students list sample spaces for single step experiments, assign probabilities to outcomes and predict relative frequencies for related events. They conduct repeated single-step chance experiments and run simulations using digital tools, giving reasons for differences between predicted and observed results.

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-7?view=quick&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&load-extra-subject=MATMATY7&achievement-standard=03c879d2-7f52-4094-9156-a76c87cfeaf3>

**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 7 Mathematics standard elaborations

		A	B	C	D	E
<b>The folio of student work contains evidence of the following:</b>						
<b>Mathematical proficiencies</b>	<b>Understanding</b>	accurate and <b>consistent</b> identification, representation, description and connection of mathematical concepts and relationships in <b>complex unfamiliar</b> , complex familiar, and simple familiar situations	<b>accurate</b> identification, representation, description and connection of mathematical concepts and relationships in <b>complex familiar</b> and simple familiar situations	identification, representation, description and connection of mathematical concepts and relationships in simple familiar situations	<b>partial</b> identification, representation and description of mathematical concepts and relationships in <b>some</b> simple familiar situations	<b>fragmented</b> identification, representation and description of mathematical concepts and relationships in <b>isolated and obvious</b> situations
	<b>Fluency</b>	choice, use and application of <b>comprehensive</b> facts, definitions, and procedures to find solutions in <b>complex unfamiliar</b> , complex familiar, and simple familiar situations	choice, use and application of <b>effective</b> facts, definitions, and procedures to find solutions in <b>complex familiar</b> and simple familiar situations	choice, use and application of facts, definitions, and procedures to find solutions in simple familiar situations	choice and use of <b>partial</b> facts, definitions, and procedures to find solutions in <b>some</b> simple familiar situations	choice and use of <b>fragmented</b> facts, definitions and procedures to find solutions in <b>isolated and obvious</b> situations
	<b>Reasoning</b>	<b>comprehensive</b> explanation of mathematical thinking, strategies used, and conclusions reached in <b>complex unfamiliar</b> , complex familiar, and simple familiar situations	<b>detailed</b> explanation of mathematical thinking, strategies used, and conclusions reached in <b>complex familiar</b> and simple familiar situations	explanation of mathematical thinking, strategies used, and conclusions reached in simple familiar situations	<b>partial</b> explanation of mathematical thinking, strategies used, and conclusions reached in <b>some</b> simple familiar situations	<b>fragmented</b> explanation of mathematical thinking, strategies used, and conclusions reached in <b>isolated and obvious</b> situations
	<b>Problem-solving</b>	<b>purposeful</b> use of problem-solving approaches to find solutions to problems.	<b>effective</b> use of problem-solving approaches to find solutions to problems.	use of problem-solving approaches to find solutions to problems.	<b>partial</b> use of problem-solving approaches <b>to make progress towards</b> finding solutions to problems.	<b>fragmented</b> use of problem-solving approaches to make progress towards finding solutions to problems.
<b>Key</b>		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 represent natural numbers in expanded form and as products of prime factors, using exponent notation.	<p><b>Number</b></p> <ul style="list-style-type: none"> <li>represent natural numbers as products of powers of prime numbers using exponent notation AC9M7N02</li> <li>represent natural numbers in expanded notation using place value and powers of 10 AC9M7N03</li> </ul>	Understanding	<ul style="list-style-type: none"> <li>representing natural numbers               <ul style="list-style-type: none"> <li>in expanded form</li> <li>as products of prime factors, using exponent notation</li> </ul> </li> </ul>
They solve problems involving squares of numbers and square roots of perfect square numbers.	<p><b>Number</b></p> <ul style="list-style-type: none"> <li>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</li> </ul>	Fluency	<ul style="list-style-type: none"> <li>solving problems involving squares of numbers and square roots of perfect square numbers</li> </ul>
Students solve problems involving addition and subtraction of integers.	<p><b>Number</b></p> <ul style="list-style-type: none"> <li>compare, order and solve problems involving addition and subtraction of integers AC9M7N07</li> </ul>	Fluency	<ul style="list-style-type: none"> <li>solving problems involving addition and subtraction of integers</li> </ul>
They use all 4 operations in calculations involving positive fractions and decimals,	<p><b>Number</b></p> <ul style="list-style-type: none"> <li>round decimals to a given accuracy appropriate to the context and use appropriate rounding and estimation to</li> </ul>	Fluency	<ul style="list-style-type: none"> <li>using all 4 operations in calculations involving positive fractions and decimals choosing efficient calculation strategies</li> </ul>

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
choosing efficient calculation strategies.	check the reasonableness of solutions AC9M7N05 <ul style="list-style-type: none"> <li>• use the 4 operations with positive rational numbers including fractions, decimals and percentages to solve problems using efficient calculation strategies AC9M7N06</li> </ul>		
Students choose between equivalent representations of rational numbers and percentages to assist in calculations.	<b>Number</b> <ul style="list-style-type: none"> <li>• find equivalent representations of rational numbers and represent rational numbers on a number line AC9M7N04</li> <li>• use the 4 operations with positive rational numbers including fractions, decimals and percentages to solve problems using efficient calculation strategies AC9M7N06</li> </ul>	Fluency	<ul style="list-style-type: none"> <li>• choosing between equivalent representations of rational numbers and percentages to assist in calculations</li> </ul>
They use mathematical modelling to solve practical problems involving rational numbers, percentages and ratios, in financial and other applied contexts, justifying choices of representation.	<b>Number</b> <ul style="list-style-type: none"> <li>• find equivalent representations of rational numbers and represent rational numbers on a number line AC9M7N04</li> <li>• use the 4 operations with positive rational numbers including fractions, decimals and percentages to solve problems using efficient calculation strategies AC9M7N06</li> </ul>	Fluency	<ul style="list-style-type: none"> <li>• solving practical problems involving rational numbers, percentages and ratios, in financial and other applied contexts</li> </ul>

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
	<ul style="list-style-type: none"> <li>recognise, represent and solve problems involving ratios AC9M7N08</li> <li>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</li> </ul> <p><b>Measurement</b></p> <ul style="list-style-type: none"> <li>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 representation AC9M7M06</li> </ul>	Reasoning	<ul style="list-style-type: none"> <li>justifying choices of representation related to mathematical modelling problems</li> </ul>
		Problem-solving	<ul style="list-style-type: none"> <li>using mathematical modelling to solve practical problems</li> </ul>
Students use algebraic expressions to represent situations, describe the relationships between variables from authentic data and substitute values into formulas to determine unknown values.	<p><b>Algebra</b></p> <ul style="list-style-type: none"> <li>recognise and use variables to represent everyday formulas algebraically and substitute values into formulas to determine an unknown AC9M7A01</li> <li>formulate algebraic expressions using constants, variables, operations and brackets AC9M7A02</li> <li>describe relationships between variables represented in graphs of functions from authentic data AC9M7A04</li> <li>manipulate formulas involving several variables using digital tools, and describe the effect of systematic variation in the values of the variables AC9M7A06</li> </ul>	Understanding	<ul style="list-style-type: none"> <li>using algebraic expressions to represent situations</li> <li>describing the relationships between variables from authentic data</li> </ul>
		Fluency	<ul style="list-style-type: none"> <li>substituting values into formulas to determine unknown values</li> </ul>

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 solve linear equations with natural number solutions.	<b>Algebra</b> <ul style="list-style-type: none"> <li>• solve one-variable linear equations with natural number solutions; verify the solution by substitution AC9M7A03</li> </ul>	Fluency	<ul style="list-style-type: none"> <li>• solving linear equations with natural number solutions</li> </ul>
Students create tables of values related to algebraic expressions and formulas, and describe the effect of variation.	<b>Algebra</b> <ul style="list-style-type: none"> <li>• generate tables of values from visually growing patterns or the rule of a function; describe and plot these relationships on the Cartesian plane AC9M7A05</li> <li>• manipulate formulas involving several variables using digital tools, and describe the effect of systematic variation in the values of the variables AC9M7A06</li> </ul>	Understanding	<ul style="list-style-type: none"> <li>• describing the effect of variation of values related to algebraic expressions</li> </ul>
		Fluency	<ul style="list-style-type: none"> <li>• creating tables of values related to algebraic expressions and formulas</li> </ul>
They apply knowledge of angle relationships and the sum of angles in a triangle to solve problems, giving reasons.	<b>Measurement</b> <ul style="list-style-type: none"> <li>• 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</li> <li>• demonstrate that the interior angle sum of a triangle in the plane is <math>180^\circ</math> and apply this to determine the interior angle sum of other shapes and the size of unknown angles AC9M7M05</li> </ul>	Fluency	<ul style="list-style-type: none"> <li>• solving problems by <ul style="list-style-type: none"> <li>– applying knowledge of angle relationships</li> <li>– applying knowledge of the sum of angles in a triangle</li> </ul> </li> </ul>
		Reasoning	<ul style="list-style-type: none"> <li>• giving reasons by applying knowledge of angle relationships</li> </ul>
Students use formulas for the areas of triangles and parallelograms and the volumes of rectangular and triangular prisms to solve problems.	<b>Algebra</b> <ul style="list-style-type: none"> <li>• recognise and use variables to represent everyday formulas algebraically and substitute values into formulas to determine an unknown AC9M7A01</li> </ul> <b>Measurement</b> <ul style="list-style-type: none"> <li>• solve problems involving the area of triangles and parallelograms using established formulas and appropriate units AC9M7M01</li> <li>• solve problems involving the volume of right prisms including rectangular and triangular prisms, using established formulas and appropriate units AC9M7M02</li> </ul>	Fluency	<ul style="list-style-type: none"> <li>• using formulas for the areas of <ul style="list-style-type: none"> <li>– triangles</li> <li>– parallelograms</li> </ul> to solve problems</li> <li>• using formulas for volumes of <ul style="list-style-type: none"> <li>– rectangular prisms</li> <li>– triangular prisms</li> </ul> to solve problems</li> </ul>

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 describe the relationships between the radius, diameter and circumference of a circle.	<b>Measurement</b> <ul style="list-style-type: none"> <li>describe the relationship between <math>\pi</math> and the features of circles including the circumference, radius and diameter AC9M7M03</li> </ul>	Understanding	<ul style="list-style-type: none"> <li>describing the relationships between the radius, diameter, circumference of a circle</li> </ul>
Students classify polygons according to their features and create an algorithm designed to sort and classify shapes.	<b>Space</b> <ul style="list-style-type: none"> <li>classify triangles, quadrilaterals and other polygons according to their side and angle properties; identify and reason about relationships AC9M7SP02</li> <li>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</li> </ul>	Understanding	<ul style="list-style-type: none"> <li>classifying polygons according to their features</li> </ul>
		Problem-solving	<ul style="list-style-type: none"> <li>creating an algorithm designed to sort and classify shapes</li> </ul>
They represent objects two-dimensionally in different ways, describing the usefulness of these representations.	<b>Space</b> <ul style="list-style-type: none"> <li>represent objects in 2 dimensions; discuss and reason about the advantages and disadvantages of different representations AC9M7SP01</li> </ul>	Understanding	<ul style="list-style-type: none"> <li>representing objects two-dimensionally in different ways</li> <li>describing the usefulness of representing objects two-dimensionally in different ways</li> </ul>
Students use coordinates to describe transformations of points in the plane.	<b>Space</b> <ul style="list-style-type: none"> <li>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</li> </ul>	Understanding	<ul style="list-style-type: none"> <li>describing transformations of points in the plane using coordinates</li> </ul>
They plan and conduct statistical investigations involving discrete and continuous numerical data, using appropriate displays.	<b>Statistics</b> <ul style="list-style-type: none"> <li>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</li> <li>create different types of numerical data displays including stem and leaf plots using software where appropriate; describe and</li> </ul>	Fluency	<ul style="list-style-type: none"> <li>using appropriate displays in statistical investigations</li> </ul>
		Problem-solving	<ul style="list-style-type: none"> <li>planning and conducting statistical investigations involving discrete and continuous numerical data</li> </ul>



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
	<p>compare the distribution of data, commenting on the shape, centre and spread including outliers and determining the range, median, mean and mode AC9M7ST02</p> <ul style="list-style-type: none"> <li>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</li> </ul>		
Students interpret data in terms of the shape of distribution and summary statistics, identifying possible outliers.	<p><b>Statistics</b></p> <ul style="list-style-type: none"> <li>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</li> <li>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</li> </ul>	Understanding	<ul style="list-style-type: none"> <li>interpreting data in terms of the <ul style="list-style-type: none"> <li>shape of distribution</li> <li>summary statistics</li> </ul> </li> <li>identifying possible outliers</li> </ul>
They decide which measure of central tendency is most suitable and explain their reasoning.	<p><b>Statistics</b></p> <ul style="list-style-type: none"> <li>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</li> <li>create different types of numerical data displays including stem and leaf plots using software where appropriate; describe and compare the distribution of</li> </ul>	Reasoning	<ul style="list-style-type: none"> <li>deciding which measure of central tendency is most suitable, explaining reasoning</li> </ul>

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, commenting on the shape, centre and spread including outliers and determining the range, median, mean and mode AC9M7ST02		
Students list sample spaces for single step experiments, assign probabilities to outcomes and predict relative frequencies for related events.	<b>Probability</b> <ul style="list-style-type: none"> <li>identify the sample space for single-stage events; assign probabilities to the outcomes of these events and predict relative frequencies for related events AC9M7P01</li> </ul>	Understanding	<ul style="list-style-type: none"> <li>assigning probabilities to outcomes and predicting relative frequencies for related events</li> </ul>
		Fluency	<ul style="list-style-type: none"> <li>listing sample spaces for single step experiments</li> </ul>
They conduct repeated single-step chance experiments and run simulations using digital tools, giving reasons for differences between predicted and observed results.	<b>Probability</b> <ul style="list-style-type: none"> <li>identify the sample space for single-stage events; assign probabilities to the outcomes of these events and predict relative frequencies for related events AC9M7P01</li> <li>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</li> </ul>	Reasoning	<ul style="list-style-type: none"> <li>giving reasons for differences between predicted and observed results</li> </ul>
		Problem-solving	<ul style="list-style-type: none"> <li>conducting repeated single-step chance experiments and run simulations using digital tools</li> </ul>

Table 2: Key terms used in Mathematics SEs

Term	Description
Simple familiar	<p>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:</p> <ul style="list-style-type: none"> <li>relationships and interactions are obvious and have few elements; and</li> <li>all of the information to solve the problem is identifiable; that is               <ul style="list-style-type: none"> <li>the required procedure is clear from the way the problem is posed, or</li> <li>in a context that has been a focus of prior learning.</li> </ul> </li> </ul> <p>Students are not required to interpret, clarify and analyse problems to develop responses.</p>
Complex familiar	<p>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:</p> <ul style="list-style-type: none"> <li>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</li> <li>all of the information to solve the problem is identifiable; that is               <ul style="list-style-type: none"> <li>the required procedure is clear from the way the problem is posed, or</li> <li>in a context that has been a focus of prior learning.</li> </ul> </li> </ul> <p>Some interpretation, clarification and analysis will be required to develop responses.</p> <p>Creating complex familiar examples may include making changes to the:</p> <ul style="list-style-type: none"> <li>number of steps required to solve the problem/situation</li> <li>changes to increments, benchmarks or scale</li> <li>number of attributes considered.</li> </ul>
Complex unfamiliar	<p>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:</p> <ul style="list-style-type: none"> <li>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</li> <li>all the information to solve the problem is not immediately identifiable; that is               <ul style="list-style-type: none"> <li>the required procedure is not clear from the way the problem is posed, and</li> <li>in a context in which students have had limited prior experience.</li> </ul> </li> </ul> <p>Students interpret, clarify and analyse problems to develop responses.</p> <p>Creating unfamiliar examples may include making changes to the:</p> <ul style="list-style-type: none"> <li>context for application, e.g. financial, measurement, spatial or statistical</li> <li>type of representation, e.g. physical, visual or symbolic</li> <li>orientation of representation, e.g. horizontal or vertical</li> <li>merge of subject matter/concepts from across different strands.</li> </ul>

 © State of Queensland (QCAA) 2024

**Licence:** <https://creativecommons.org/licenses/by/4.0> | **Copyright notice:** [www.qcaa.qld.edu.au/copyright](http://www.qcaa.qld.edu.au/copyright) — lists the full terms and conditions, which specify certain exceptions to the licence. | **Attribution:** (include the link): © State of Queensland (QCAA) 2024

Unless otherwise indicated material from Australian Curriculum is © ACARA 2010–present, licensed under CC BY 4.0. For the latest information and additional terms of use, please check the [Australian Curriculum website](http://www.australiancurriculum.edu.au) and its [copyright notice](#).