

Year 6 standard elaborations — Australian Curriculum: Mathematics

- Purpose** The standard elaborations (SEs) provide additional clarity when using the Australian Curriculum achievement standard to make judgments on a five-point scale. They promote and support:
- aligning curriculum, assessment and reporting, connecting curriculum and evidence in assessment, so that what is assessed relates directly to what students have had the opportunity to learn
 - continuing skill development from one year of schooling to another
 - making judgments on a five-point scale based on evidence of learning in a folio of student work
 - developing task-specific standards and grading guides.

Structure The SEs are developed using the **Australian Curriculum achievement standard**. In Prep* to Year 6, the Mathematics SEs have been organised using the **content and proficiency strands**. Performance is frequently represented in terms of complexity and familiarity of the standard being assessed. Across the elaborations this is described according to:

A — unfamiliar, B — complex familiar, C — simple familiar, D — some simple familiar, E — partial, isolated and obvious.

The Mathematics achievement standard describes the learning expected of students at each year level. Teachers use the achievement standard during and at the end of a period of teaching to make on-balance judgments about the quality of learning students demonstrate.

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**. The **discernible differences** or degrees of quality associated with the five-point scale are highlighted to identify the characteristics of student work on which teacher judgments are made. Terms are described in the Notes section following the matrix.

Year 6 Australian Curriculum: Mathematics achievement standard

By the end of Year 6, students recognise the properties of prime, composite, square and triangular numbers. They describe the use of integers in everyday contexts. They solve problems involving all four operations with whole numbers. Students connect fractions, decimals and percentages as different representations of the same number. They solve problems involving the addition and subtraction of related fractions. Students make connections between the powers of 10 and the multiplication and division of decimals. They describe rules used in sequences involving whole numbers, fractions and decimals. Students connect decimal representations to the metric system and choose appropriate units of measurement to perform a calculation. They make connections between capacity and volume. They solve problems involving length and area. They interpret timetables. Students describe combinations of transformations. They solve problems using the properties of angles. Students compare observed and expected frequencies. They interpret and compare a variety of data displays including those displays for two categorical variables. They interpret secondary data displayed in the media.

Students locate fractions and integers on a number line. They calculate a simple fraction of a quantity. They add, subtract and multiply decimals and divide decimals where the result is rational. Students calculate common percentage discounts on sale items. They write correct number sentences using brackets and order of operations. Students locate an ordered pair in any one of the four quadrants on the Cartesian plane. They construct simple prisms and pyramids. Students describe probabilities using simple fractions, decimals and percentages.

Source Australian Curriculum, Assessment and Reporting Authority (ACARA), *Australian Curriculum Version 8 Mathematics for Foundation–10*, www.australiancurriculum.edu.au/Mathematics/Curriculum/F-10

* Prep in Queensland is the Foundation Year of the Australian Curriculum and refers to the year before Year 1. Children beginning Prep in January must be five years of age by 30 June.

Year 6 Mathematics standard elaborations

		A	B	C	D	E
The folio of a student's work has the following characteristics:						
Number and algebra	Understanding	recognition <u>and explanation</u> of the properties of prime, composite, square and triangular numbers <u>in unfamiliar situations</u>	recognition <u>and explanation</u> of the properties of prime, composite, square and triangular numbers	recognition of the properties of prime, composite, square and triangular numbers	recognition of <u>aspects of</u> the properties of prime, composite, square and triangular numbers	<u>directed</u> recognition of <u>aspects of</u> the properties of prime, composite, square and triangular numbers
		description of the use of integers in <u>unfamiliar situations</u>	description of the use of integers in <u>complex familiar situations</u>	description of the use of integers in everyday contexts	<u>guided</u> description of the use of integers in everyday contexts	<u>directed</u> description of the use of integers in everyday contexts
		connection of fractions, decimals and percentages as different representations of the same number <u>and explanation of the connections in unfamiliar situations</u>	connection of fractions, decimals and percentages as different representations of the same number <u>and explanation of the connections</u>	connection of fractions, decimals and percentages as different representations of the same number	connection of <u>aspects of</u> fractions, decimals and percentages as different representations of the same number	<u>directed</u> connection of <u>aspects of</u> fractions, decimals and percentages as different representations of the same number
		making of connections between the powers of 10 and the multiplication and division of decimals <u>to solve problems in unfamiliar situations</u>	making of connections between the powers of 10 and the multiplication and division of decimals <u>to solve problems</u>	making of connections between the powers of 10 and the multiplication and division of decimals	making of <u>partial</u> connections between the powers of 10 and the multiplication and division of decimals	<u>directed</u> making of partial connections between the powers of 10 and the multiplication and division of decimals
		location of fractions and integers on an <u>open number line and explanation of placement</u>	location of fractions and integers on a number line <u>and explanation of placement</u>	location of fractions and integers on a number line	location of <u>aspects of</u> fractions and <u>aspects of</u> integers on a number line	<u>directed</u> location of <u>aspects of</u> fractions and <u>aspects of</u> integers on a number line

		A	B	C	D	E
Number and algebra	Fluency	use of efficient strategies for calculation of a fraction of a quantity	calculation of a fraction of a quantity	calculation of a simple fraction of a quantity	guided calculation of a simple fraction of a quantity	directed calculation of a simple fraction of a quantity
		calculation of percentage discounts on sale items in unfamiliar situations	calculation of percentage discounts on sale items	calculation of common percentage discounts on sale items	calculation of aspects of common percentage discounts on sale items	directed calculation of aspects of common percentage discounts on sale items
	Problem-solving	use of a range of efficient strategies to solve problems involving all four operations with whole numbers in unfamiliar situations	use of a range of efficient strategies to solve problems involving all four operations with whole numbers in complex familiar situations	solving of problems involving all four operations with whole numbers	solving of aspects of problems involving all four operations with whole numbers	directed use of strategies to solve aspects of simple problems involving all four operations with whole numbers
		addition and subtraction of decimals in unfamiliar situations	addition and subtraction of decimals in complex familiar situations	addition and subtraction of decimals	addition and subtraction of aspects of decimals	directed addition and subtraction of aspects of decimals
		multiplication of decimals and division of decimals where the result is rational in unfamiliar situations	multiplication of decimals and division of decimals where the result is rational in complex familiar situations	multiplication of decimals and division of decimals where the result is rational	guided multiplication of decimals and division of decimals where the result is rational	directed multiplication of decimals and division of decimals where the result is rational
		solving of problems involving the addition and subtraction of related fractions in unfamiliar situations	solving of problems involving the addition and subtraction of related fractions in complex familiar situations	solving of problems involving the addition and subtraction of related fractions	solving of aspects of problems involving the addition and subtraction of related fractions	directed solving of aspects of problems involving the addition and subtraction of related fractions

		A	B	C	D	E
Number and algebra	Reasoning	writing of <u>and explanation of</u> correct number sentences using brackets and order of operations <u>in unfamiliar situations</u>	writing of <u>and explanation of</u> correct number sentences using brackets and order of operations	writing of correct number sentences using brackets and order of operations	<u>guided</u> writing of number sentences using brackets and <u>aspects of</u> order of operations	<u>directed</u> writing of number sentences using brackets
		description of rules used in sequences involving whole numbers, fractions and decimals <u>in unfamiliar contexts</u>	description of rules used in sequences involving whole numbers, fractions and decimals <u>in complex familiar situations</u>	description of rules used in sequences involving whole numbers, fractions and decimals	description of rules used in <u>aspects of</u> sequences involving whole numbers, fractions and decimals	<u>directed</u> description of rules used in <u>aspects of</u> sequences involving whole numbers, fractions and decimals
Measurement and geometry	Understanding	making of connections between capacity and volume <u>and their units of measurement in unfamiliar contexts</u>	making of connections between capacity and volume <u>and their units of measurement</u>	making of connections between capacity and volume	<u>guided</u> making of connections between capacity and volume	<u>directed</u> making of connections between capacity and volume
		construction of prisms and pyramids using a range of representations, <u>making connections between different representations</u>	construction of simple prisms and pyramids <u>using a range of representations</u>	construction of simple prisms and pyramids	<u>guided</u> construction of simple prisms and pyramids	<u>directed</u> construction of simple prisms and pyramids
	Fluency	connection of decimal representations to the metric system <u>in unfamiliar situations</u>	connection of decimal representations to the metric system <u>in complex familiar situations</u>	connection of decimal representations to the metric system	connection of <u>aspects of</u> decimal representations to the metric system	<u>directed</u> connection of <u>aspects of</u> decimal representations to the metric system
		choice <u>and explanation of</u> appropriate units of measurement to perform a calculation	choice <u>and description of</u> appropriate units of measurement to perform a calculation	choice of appropriate units of measurement to perform a calculation	choice of units of measurement to perform <u>aspects of</u> a calculation	<u>directed</u> choice of units of measurement to perform <u>aspects of</u> a calculation

		A	B	C	D	E
Measurement and geometry	Fluency	interpretation <u>and use of timetables in unfamiliar situations</u>	interpretation <u>and use of timetables</u>	interpretation of timetables	interpretation of <u>aspects of timetables</u>	<u>directed</u> interpretation of <u>aspects of timetables</u>
		location of an ordered pair in any one of the four quadrants on the Cartesian plane <u>in unfamiliar situations</u>	location of an ordered pair in any one of the four quadrants on the Cartesian plane <u>in complex familiar situations</u>	location of an ordered pair in any one of the four quadrants on the Cartesian plane	<u>partial</u> location of an ordered pair in any one of the four quadrants on the Cartesian plane	<u>directed</u> location of an ordered pair in any one of the four quadrants on the Cartesian plane
	Problem-solving	<u>use of efficient strategies in the solving of problems involving length and area in unfamiliar situations</u>	<u>use of efficient strategies in the solving of problems involving length and area</u>	solving of problems involving length and area	solving of <u>aspects of problems involving length and area</u>	<u>directed</u> solving of <u>aspects of problems involving length and area</u>
		<u>use of efficient strategies in the solving of problems using the properties of angles in unfamiliar situations</u>	<u>use of efficient strategies in the solving of problems using the properties of angles</u>	solving of problems using the properties of angles	solving of <u>aspects of problems using the properties of angles</u>	<u>directed</u> solving of <u>aspects of problems using the properties of angles</u>
	Reasoning	description of combinations of transformations <u>in unfamiliar situations</u>	description of combinations of transformations <u>in complex familiar situations</u>	description of combinations of transformations	<u>partial</u> description of combinations of transformations	<u>statements about aspects of combinations of transformations</u>

		A	B	C	D	E
Statistics and probability	Understanding	description of probabilities using fractions, decimals and percentages <u>in unfamiliar situations</u>	description of probabilities using fractions, decimals and percentages <u>in complex familiar situations</u>	description of probabilities using fractions, decimals and percentages	<u>partial</u> description of probabilities using fractions, decimals and percentages	<u>directed</u> description of probabilities using fractions, decimals and percentages
	Fluency	<p><i>Fluency</i> is critical across all content strands in Mathematics.</p> <p>In Year 6, fluency of statistics and probability is not explicitly identified in the achievement standard. It appears in the content descriptions so there are opportunities to strengthen student fluency.</p>				
	Problem-solving	<u>reasoned</u> interpretation of secondary data displayed in the media	<u>thorough</u> interpretation of secondary data displayed in the media	interpretation of secondary data displayed in the media	<u>guided</u> interpretation of secondary data displayed in the media	<u>directed</u> interpretation of secondary data displayed in the media
	Reasoning	comparison of observed and expected frequencies and <u>reasoned explanation of differences</u>	comparison of observed and expected frequencies and <u>explanation of differences</u>	comparison of observed and expected frequencies	<u>partial</u> comparison of observed and expected frequencies	<u>directed</u> comparison of observed and expected frequencies
		<u>reasoned</u> interpretation and <u>detailed</u> comparison of a variety of data displays including those displays for two categorical variables	interpretation and <u>detailed</u> comparison of a variety of data displays including those displays for two categorical variables	interpretation and comparison of a variety of data displays including those displays for two categorical variables	<u>partial</u> interpretation and comparison of a variety of data displays including those displays for two categorical variables	<u>directed</u> interpretation and comparison of a variety of data displays
Key	<u>shading</u> emphasises the <u>qualities that discriminate between A–E descriptors</u>					

Notes

Australian Curriculum common dimensions

The SEs describe the qualities of achievement in the two dimensions common to all Australian Curriculum learning area achievement standards — understanding and skills.

Dimension	Description
understanding	the concepts underpinning and connecting knowledge in a learning area, related to a student's ability to appropriately select and apply knowledge to solve problems in that learning area
skills	the specific techniques, strategies and processes in a learning area

Terms used in Year 6 Mathematics SEs

The following terms are used in the Year 6 Mathematics SEs. Definitions are drawn from the ACARA Australian Curriculum Mathematics glossary (www.australiancurriculum.edu.au/f-10-curriculum/mathematics/glossary) and from other sources to ensure consistent understanding.

Term	Description
aspects	particular parts or features
comparison; compare	estimate, measure or note how things are similar or dissimilar
complex familiar	students are required to choose and apply procedures in a situation involving a number of elements, components or steps in a context that has been a focus of prior learning
connection; connect	establish a link
description; descriptive; describe	give an account of characteristics or features
directed; direction	following the instructions of the facilitator
effective	meeting the assigned purpose in a considered and/or efficient manner to produce a desired or intended result
efficient	in a well-organised and competent way; in the context of mathematics this means solving a problem using minimal steps
explanation; explanatory; explain	provide additional information that demonstrates understanding of reasoning and/or application; in mathematics this could include showing working to justify a response
fluency	students develop skills in choosing appropriate procedures; carrying out procedures flexibly, accurately, efficiently and appropriately; and recalling factual knowledge and concepts readily; students are fluent when they calculate answers efficiently, when they recognise robust ways of answering questions, when they choose appropriate methods and approximations, when they recall definitions and regularly use facts, and when they can manipulate expressions and equations to find solutions; in Year 6, <i>fluency</i> includes such things as representing integers on a number line, calculating simple percentages, using brackets appropriately, converting between fractions and decimals, using operations with fractions, decimals and percentages, measuring using metric units and interpreting timetables

Term	Description
guided; guidance	visual and/or verbal prompts to facilitate or support independent action
partial	incomplete, half-done, unfinished
interpretation; interpret	explaining the meaning of information or actions; in the context of Mathematics, this involves giving meaning to information presented in various forms, e.g. words, symbols, diagrams, graphs
problem-solving	students develop the ability to make choices, interpret, formulate, model and investigate problem situations, and communicate solutions effectively; students formulate and solve problems when they use mathematics to represent unfamiliar or meaningful situations, when they design investigations and plan their approaches, when they apply their existing strategies to seek solutions, and when they verify that their answers are reasonable; in Year 6, <i>problem-solving</i> includes such things as formulating and solving authentic problems using fractions, decimals, percentages and measurements, interpreting secondary data displays and finding the size of unknown angles
reasoning	students develop an increasingly sophisticated capacity for logical thought and actions, such as analysing, proving, evaluating, explaining, inferring, justifying and generalising; students are reasoning mathematically when they explain their thinking, when they deduce and justify strategies used and conclusions reached, when they adapt the known to the unknown, when they transfer learning from one context to another, when they prove that something is true or false and when they compare and contrast related ideas and explain their choices; in Year 6, <i>reasoning</i> includes such things as explaining mental strategies for performing calculations, describing results for continuing number sequences, explaining the transformation of one shape into another and explaining why the actual results of chance experiments may differ from expected results
reasons; reasoned	logical and sound; presented with justification
represent	use words, images, symbols or signs to convey meaning
statement; state	a sentence or assertion
thorough	demonstrating depth and breadth, inclusive of relevant detail
understanding	students build a robust knowledge of adaptable and transferable mathematical concepts; they make connections between related concepts and progressively apply the familiar to develop new ideas; they develop an understanding of the relationship between the 'why' and the 'how' of mathematics; students build understanding when they connect related ideas, when they represent concepts in different ways, when they identify commonalities and differences between aspects of content, when they describe their thinking mathematically and when they interpret mathematical information; in Year 6, <i>understanding</i> includes such things as describing properties of different sets of numbers, using fractions and decimals to describe probabilities, representing fractions and decimals in various ways and describing connections between them, and making reasonable estimations
unfamiliar	students are required to choose and apply procedures in a situation involving a number of elements, components or steps in a context in which students have had limited prior experience
use; use of	to operate or put into effect