

Year 5 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 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 5 Australian Curriculum: Mathematics achievement standard

By the end of Year 5, students use place value to write and order decimals including decimals greater than one. They express natural numbers as products of factors and identify multiples. Students order and represent, add and subtract fractions with the same or related denominators. They represent common percentages and connect them to their fraction and decimal equivalents. Students use their proficiency with multiplication facts and efficient calculation strategies to multiply large numbers by one- and two-digit numbers and divide by single-digit numbers. They check the reasonableness of their calculations using estimation. Students use mathematical modelling to solve financial and other practical problems, formulating and solving problems, choosing arithmetic operations and interpreting results in terms of the situation. They apply properties of numbers and operations to find unknown values in numerical equations involving multiplication and division. Students create and use algorithms to identify and explain patterns in the factors and multiples of numbers.

They choose and use appropriate metric units to measure the attributes of length, mass and capacity, and to solve problems involving perimeter and area. Students convert between 12- and 24-hour time. They estimate, construct and measure angles in degrees. Students use grid coordinates to locate and move positions. They connect objects to their two-dimensional nets. Students perform and describe the results of transformations and identify any symmetries.

They plan and conduct statistical investigations that collect nominal and ordinal categorical and discrete numerical data using digital tools. Students identify the mode and interpret the shape of distributions of data in context. They interpret and compare data represented in line graphs. Students conduct repeated chance experiments, list the possible outcomes, estimate likelihoods and make comparisons between those with and without equally likely outcomes.

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-5?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 5 Mathematics standard elaborations

		A	B	C	D	E
		The folio of student work contains evidence of the following:				
Mathematical proficiencies	Understanding	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> identification, representation, description and connection of mathematical concepts and relationships in simple familiar situations, identification, representation, description and connection of mathematical concepts and relationships 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • explanation of mathematical thinking, strategies used, and conclusions reached • in simple familiar situations, explanation of mathematical thinking, strategies used, and conclusions reached 	<ul style="list-style-type: none"> • partial explanation of mathematical thinking, strategies used, and conclusions reached • in some simple familiar situations, explanation of mathematical thinking, strategies used, and conclusions reached 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • purposeful use of problem-solving approaches to find solutions to problems. 	<ul style="list-style-type: none"> • effective use of problem-solving approaches to find solutions to problems. 	<ul style="list-style-type: none"> • use of problem-solving approaches to find solutions to problems. 	<ul style="list-style-type: none"> • partial use of problem-solving approaches to make progress towards finding solutions to problems. 	<ul style="list-style-type: none"> • 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 use place value to write and order decimals including decimals greater than one.	Number <ul style="list-style-type: none"> interpret, compare and order numbers with more than 2 decimal places, including numbers greater than one, using place value understanding; represent these on a number line AC9M5N01 	<ul style="list-style-type: none"> using place value to write and order decimals including decimals greater than one 	Fluency
They express natural numbers as products of factors and identify multiples.	Number <ul style="list-style-type: none"> express natural numbers as products of their factors, recognise multiples and determine if one number is divisible by another AC9M5N02 	<ul style="list-style-type: none"> identifying multiples 	Understanding
		<ul style="list-style-type: none"> expressing natural numbers as products of factors 	Fluency
Students order and represent, add and subtract fractions with the same or related denominators.	Number <ul style="list-style-type: none"> compare and order fractions with the same and related denominators including mixed numerals, applying knowledge of factors and multiples; represent these fractions on a number line AC9M5N03 	<ul style="list-style-type: none"> representing fractions with the same or related denominators 	Understanding
		<ul style="list-style-type: none"> ordering fractions with the same or related denominators adding fractions with the same or related denominators subtracting fractions with the same or related denominators 	Fluency

Aspect of the achievement standard	Related content description/s	Examples of evidence	Mathematical proficiencies
They represent common percentages and connect them to their fraction and decimal equivalents.	Number <ul style="list-style-type: none"> recognise that 100% represents the complete whole and use percentages to describe, represent and compare relative size; connect familiar percentages to their decimal and fraction equivalents AC9M5N04 	<ul style="list-style-type: none"> representing common percentages connecting percentages to their fraction and decimal equivalents 	Understanding
Students use their proficiency with multiplication facts and efficient calculation strategies to multiply large numbers by one- and two-digit numbers and divide by single-digit numbers.	Number <ul style="list-style-type: none"> solve problems involving multiplication of larger numbers by one- or two-digit numbers, choosing efficient calculation strategies and using digital tools where appropriate; check the reasonableness of answers AC9M5N06 solve problems involving division, choosing efficient strategies and using digital tools where appropriate; interpret any remainder according to the context and express results as a whole number, decimal or fraction AC9M5N07 Algebra <ul style="list-style-type: none"> recognise and explain the connection between multiplication and division as inverse operations and use this to develop families of number facts AC9M5A01 	<ul style="list-style-type: none"> multiplying large numbers by one-digit numbers using proficiency with multiplication facts and efficient calculation strategies multiplying large numbers by two-digit numbers using proficiency with multiplication facts and efficient calculation strategies dividing large numbers by single-digit numbers using proficiency with multiplication facts and efficient calculation strategies 	Fluency
They check the reasonableness of their calculations using estimation.	Number <ul style="list-style-type: none"> check and explain the reasonableness of solutions to problems including financial contexts using estimation strategies appropriate to the context AC9M5N08 	<ul style="list-style-type: none"> checking the reasonableness of calculations using estimation 	Reasoning

Aspect of the achievement standard	Related content description/s	Examples of evidence	Mathematical proficiencies
Students use mathematical modelling to solve financial and other practical problems, formulating and solving problems, choosing arithmetic operations and interpreting results in terms of the situation.	Number <ul style="list-style-type: none"> solve problems involving division, choosing efficient strategies and using digital tools where appropriate; interpret any remainder according to the context and express results as a whole number, decimal or fraction AC9M5N07 use mathematical modelling to solve practical problems involving additive and multiplicative situations including financial contexts; formulate the problems, choosing operations and efficient calculation strategies, using digital tools where appropriate; interpret and communicate solutions in terms of the situation AC9M5N09 	<ul style="list-style-type: none"> formulating financial and other practical problems 	Understanding
		<ul style="list-style-type: none"> solving financial and other practical problems, choosing arithmetic operations 	Fluency
		<ul style="list-style-type: none"> interpreting results related to mathematical modelling problems in terms of the situation 	Reasoning
		<ul style="list-style-type: none"> using mathematical modelling to solve financial and other practical problems 	Problem-solving
They apply properties of numbers and operations to find unknown values in numerical equations involving multiplication and division.	Algebra <ul style="list-style-type: none"> recognise and explain the connection between multiplication and division as inverse operations and use this to develop families of number facts AC9M5A01 find unknown values in numerical equations involving multiplication and division using the properties of numbers and operations AC9M5A02 	<ul style="list-style-type: none"> applying properties of numbers and operations to find unknown values in numerical equations involving multiplication and division 	Fluency
Students create and use algorithms to identify and explain patterns in the factors and multiples of numbers.	Algebra <ul style="list-style-type: none"> create and use algorithms involving a sequence of steps and decisions and digital tools to experiment with factors, multiples and divisibility; identify, interpret and describe emerging patterns AC9M5N010 	<ul style="list-style-type: none"> identifying patterns in the factors and multiples of numbers 	Understanding
		<ul style="list-style-type: none"> using algorithms to identify patterns in the factors and multiples of numbers 	Fluency
		<ul style="list-style-type: none"> explaining patterns in the factors and multiples of numbers 	Reasoning
		<ul style="list-style-type: none"> creating algorithms 	Problem-solving

Aspect of the achievement standard	Related content description/s	Examples of evidence	Mathematical proficiencies
They choose and use appropriate metric units to measure the attributes of length, mass and capacity, and to solve problems involving perimeter and area.	Measurement <ul style="list-style-type: none"> choose appropriate metric units when measuring the length, mass and capacity of objects; use smaller units or a combination of units to obtain a more accurate measure AC9M5M01 solve practical problems involving the perimeter and area of regular and irregular shapes using appropriate metric units AC9M5M02 	<ul style="list-style-type: none"> choosing and using appropriate metric units to measure the attributes of <ul style="list-style-type: none"> length mass capacity solving problems involving <ul style="list-style-type: none"> perimeter area 	Fluency
Students convert between 12- and 24-hour time.	Measurement <ul style="list-style-type: none"> compare 12- and 24-hour time systems and solve practical problems involving the conversion between them AC9M5M03 	<ul style="list-style-type: none"> converting between 12- and 24-hour time 	Fluency
They estimate, construct and measure angles in degrees.	Measurement <ul style="list-style-type: none"> estimate, construct and measure angles in degrees, using appropriate tools including a protractor, and relate these measures to angle names AC9M5M04 	<ul style="list-style-type: none"> estimating and measuring angles in degrees constructing angles in degrees 	Fluency
Students use grid coordinates to locate and move positions.	Space <ul style="list-style-type: none"> construct a grid coordinate system that uses coordinates to locate positions within a space; use coordinates and directional language to describe position and movement AC9M5SP02 	<ul style="list-style-type: none"> using grid coordinates to <ul style="list-style-type: none"> locate positions move positions 	Fluency
They connect objects to their two-dimensional nets.	Space <ul style="list-style-type: none"> connect objects to their nets and build objects from their nets using spatial and geometric reasoning AC9M5SP01 	<ul style="list-style-type: none"> connecting objects to their two-dimensional nets 	Understanding
Students perform and describe the results of transformations and identify any symmetries.	Space <ul style="list-style-type: none"> describe and perform translations, reflections and rotations of shapes, using dynamic geometric software where appropriate; recognise what changes and what remains the same, and identify any symmetries AC9M5SP03 	<ul style="list-style-type: none"> describing the results of transformations identifying any symmetries 	Understanding
		<ul style="list-style-type: none"> performing transformations 	Fluency

Aspect of the achievement standard	Related content description/s	Examples of evidence	Mathematical proficiencies
They plan and conduct statistical investigations that collect nominal and ordinal categorical and discrete numerical data using digital tools.	Statistics <ul style="list-style-type: none"> acquire, validate and represent data for nominal and ordinal categorical and discrete numerical variables, to address a question of interest or purpose using software including spreadsheets; discuss and report on data distributions in terms of highest frequency (mode) and shape, in the context of the data AC9M5ST01 plan and conduct statistical investigations by posing questions or identifying a problem and collecting relevant data; choose appropriate displays and interpret the data; communicate findings within the context of the investigation AC9M5ST03 	<ul style="list-style-type: none"> collecting nominal and ordinal categorical and discrete numerical data using digital tools 	Fluency
		<ul style="list-style-type: none"> planning and conducting statistical investigations 	Problem-solving
Students identify the mode and interpret the shape of distributions of data in context.	Statistics <ul style="list-style-type: none"> acquire, validate and represent data for nominal and ordinal categorical and discrete numerical variables, to address a question of interest or purpose using software including spreadsheets; discuss and report on data distributions in terms of highest frequency (mode) and shape, in the context of the data AC9M5ST01 	<ul style="list-style-type: none"> identifying the mode 	Understanding
		<ul style="list-style-type: none"> interpreting the shape of distributions of data in context 	Reasoning
They interpret and compare data represented in line graphs.	Statistics <ul style="list-style-type: none"> interpret line graphs representing change over time; discuss the relationships that are represented and conclusions that can be made AC9M5ST02 	<ul style="list-style-type: none"> interpreting data represented in line graphs 	Understanding
		<ul style="list-style-type: none"> comparing data represented in line graphs 	Reasoning
Students conduct repeated chance experiments, list the possible outcomes, estimate likelihoods and make comparisons between those with	Probability <ul style="list-style-type: none"> list the possible outcomes of chance experiments involving equally likely outcomes and compare to those which are not equally likely AC9M5P01 	<ul style="list-style-type: none"> listing possible outcomes estimating likelihoods 	Fluency
		<ul style="list-style-type: none"> making comparisons between outcomes with and without equal likelihoods 	Reasoning

Aspect of the achievement standard	Related content description/s	Examples of evidence	Mathematical proficiencies
and without equally likely outcomes.	<ul style="list-style-type: none"> conduct repeated chance experiments including those with and without equally likely outcomes, observe and record the results; use frequency to compare outcomes and estimate their likelihoods AC9M5P02	<ul style="list-style-type: none"> conducting repeated chance experiments 	Problem-solving

Table 2: Key terms used in Mathematics SEs

Term	Description
Simple familiar	<p>In questions of this degree of difficulty, students respond to situations where:</p> <ul style="list-style-type: none"> relationships and interactions are obvious and have few elements; and all of the information to solve the problem is identifiable, that is <ul style="list-style-type: none"> the required procedure is clear from the way the problem is posed, or in a context that has been a focus of prior learning. <p>Students are not required to interpret, clarify and analyse problems to develop responses.</p>
Complex familiar	<p>In questions of this degree of difficulty, students respond to situations where:</p> <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> the required procedure is clear from the way the problem is posed, or in a context that has been a focus of prior learning. <p>Some interpretation, clarification and analysis will be required to develop responses.</p> <p>Shifting the level of complexity may include making changes to the:</p> <ul style="list-style-type: none"> 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	<p>In questions of this degree of difficulty, students respond to situations where:</p> <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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. <p>Students interpret, clarify and analyse problems to develop responses.</p> <p>Shifting the level of familiarity may include making changes to the:</p> <ul style="list-style-type: none"> 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.



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