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|  | Year 6 standard elaborations — Australian Curriculum: Mathematics |

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| 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[[1]](#footnote-1) 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. |
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| 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. | |
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| **Source** | Australian Curriculum, Assessment and Reporting Authority (ACARA), Australian Curriculum Version 8 Mathematics for Foundation–10, [www.australiancurriculum.edu.au/Mathematics/Curriculum/F-10](http://www.australiancurriculum.edu.au/Mathematics/Curriculum/F-10) |

## Year 6 Mathematics standard elaborations

|  | | A | B | C | D | E |
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|  | | The folio of a student’s work has the following characteristics: | | | | |
| Number and algebra | Understanding | recognition and explanation of the properties of prime, composite, square and triangular numbers in unfamiliar situations | recognition and explanation of the properties of prime, composite, square and triangular numbers | recognition of the properties of prime, composite, square and triangular numbers | recognition of aspects of the properties of prime, composite, square and triangular numbers | directed recognition of aspects of the properties of prime, composite, square and triangular numbers |
| description of the use of integers in unfamiliar situations | description of the use of integers in complex familiar situations | description of the use of integers in everyday contexts | guided description of the use of integers in everyday contexts | directed description of the use of integers in everyday contexts |
| connection of fractions, decimals and percentages as different representations of the same number and explanation of the connections in unfamiliar situations | connection of fractions, decimals and percentages as different representations of the same number and explanation of the connections | connection of fractions, decimals and percentages as different representations of the same number | connection of aspects of fractions, decimals and percentages as different representations of the same number | directed connection of aspects of 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 to solve problems in unfamiliar situations | making of connections between the powers of 10 and the multiplication and division of decimals to solve problems | making of connections between the powers of 10 and the multiplication and division of decimals | making of partial connections between the powers of 10 and the multiplication and division of decimals | directed making of partial connections between the powers of 10 and the multiplication and division of decimals |
| location of fractions and integers on an open number line and explanation of placement | location of fractions and integers on a number line and explanation of placement | location of fractions and integers on a number line | location of aspects of fractions and aspects of integers on a number line | directed location of aspects of fractions and aspects of integers on a number line |
| 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 |
| Number and algebra | Reasoning | writing of and explanation of correct number sentences using brackets and order of operations in unfamiliar situations | writing of and explanation of correct number sentences using brackets and order of operations | writing of correct number sentences using brackets and order of operations | guided writing of number sentences using brackets and aspects of order of operations | directed writing of number sentences using brackets |
| description of rules used in sequences involving whole numbers, fractions and decimals in unfamiliar contexts | description of rules used in sequences involving whole numbers, fractions and decimals in complex familiar situations | description of rules used in sequences involving whole numbers, fractions and decimals | description of rules used in aspects of sequences involving whole numbers, fractions and decimals | directed description of rules used in aspects of sequences involving whole numbers, fractions and decimals |
| Measurement and geometry | Understanding | making of connections between capacity and volume and their units of measurement in unfamiliar contexts | making of connections between capacity and volume and their units of measurement | making of connections between capacity and volume | guided making of connections between capacity and volume | directed making of connections between capacity and volume |
| construction of prisms and pyramids using a range of representations, making connections between different representations | construction of simple prisms and pyramids using a range of representations | construction of simple prisms and pyramids | guided construction of simple prisms and pyramids | directed construction of simple prisms and pyramids |
| Fluency | connection of decimal representations to the metric system in unfamiliar situations | connection of decimal representations to the metric system in complex familiar situations | connection of decimal representations to the metric system | connection of aspects of decimal representations to the metric system | directed connection of aspects of decimal representations to the metric system |
| choice and explanation of appropriate units of measurement to perform a calculation | choice and description of 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 aspects of a calculation | directed choice of units of measurement to perform aspects of a calculation |
| Measurement and geometry | Fluency | interpretation and use of timetables in unfamiliar situations | interpretation and use of timetables | interpretation of timetables | interpretation of aspects of timetables | directed interpretation of aspects of timetables |
| location of an ordered pair in any one of the four quadrants on the Cartesian plane in unfamiliar situations | location of an ordered pair in any one of the four quadrants on the Cartesian plane in complex familiar situations | location of an ordered pair in any one of the four quadrants on the Cartesian plane | partial location of an ordered pair in any one of the four quadrants on the Cartesian plane | directed location of an ordered pair in any one of the four quadrants on the Cartesian plane |
| Problem-solving | use of efficient strategies in the solving of problems involving length and area in unfamiliar situations | use of efficient strategies in the solving of problems involving length and area | solving of problems involving length and area | solving of aspects of problems involving length and area | directed solving of aspects of problems involving length and area |
| use of efficient strategies in the solving of problems using the properties of angles in unfamiliar situations | use of efficient strategies in the solving of problems using the properties of angles | solving of problems using the properties of angles | solving of aspects of problems using the properties of angles | directed solving of aspects of problems using the properties of angles |
| Reasoning | description of combinations of transformations in unfamiliar situations | description of combinations of transformations in complex familiar situations | description of combinations of transformations | partial description of combinations of transformations | statements about aspects of combinations of transformations |
| Statistics and probability | Understanding | description of probabilities using fractions, decimals and percentages in unfamiliar situations | description of probabilities using fractions, decimals and percentages in complex familiar situations | description of probabilities using fractions, decimals and percentages | partial description of probabilities using fractions, decimals and percentages | directed description of probabilities using fractions, decimals and percentages |
| Fluency | Fluency is critical across all content strands in Mathematics.  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. | | | | |
| Problem-solving | reasoned interpretation of secondary data displayed in the media | thorough interpretation of secondary data displayed in the media | interpretation of secondary data displayed in the media | guided interpretation of secondary data displayed in the media | directed interpretation of secondary data displayed in the media |
| Reasoning | comparison of observed and expected frequencies and reasoned explanation of differences | comparison of observed and expected frequencies and explanation of differences | comparison of observed and expected frequencies | partial comparison of observed and expected frequencies | directed comparison of observed and expected frequencies |
| reasoned interpretation and detailed comparison of a variety of data displays including those displays for two categorical variables | interpretation and detailed 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 | partial interpretation and comparison of a variety of data displays including those displays for two categorical variables | directed interpretation and comparison of a variety of data displays |
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| Key | | shading emphasises the qualities that discriminate between A–E descriptors | | | | |

## 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.

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| 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](https://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, fluency 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 |
| 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, problem-solving 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, reasoning 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, understanding 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 |

1. 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. [↑](#footnote-ref-1)