Year 6 plan — Australian Curriculum: Mathematics

Implementation year: School name:

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| Identify curriculum | Year level description | The proficiency strands *Understanding*, *Fluency*, *Problem* *Solving* and *Reasoning* are an integral part of mathematics content across the three content strands: *Number* *and* *Algebra*, *Measurement* *and* *Geometry*, and *Statistics* *and* *Probability*. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics.  At this year level:  *Understanding* includes 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  *Fluency* includes 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  *Problem* *Solving* includes formulating and solving authentic problems using fractions, decimals, percentages and measurements, interpreting secondary data displays, and finding the size of unknown angles  *Reasoning* includes explaining mental strategies for performing calculations, describing results for continuing number sequences, explaining the transformation of one shape into another, and why the actual results of chance experiments may differ from expected results. | | | |
| 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 evaluate 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 list and communicate probabilities using simple fractions, decimals and percentages. | | | |
| Source: Australian Curriculum, Assessment and Reporting Authority (ACARA), *Australian Curriculum v3.0: Mathematics for Foundation–10*, <www.australiancurriculum.edu.au/Mathematics/Curriculum/F-10>. | | | |
| Teaching and learning | Term overview | Term 1 | Term 2 | Term 3 | Term 4 |
| During this term students will:   * identify and describe prime, composite, square and triangular numbers * compare fractions with related denominators and represent them on a number line * add and subtract fractions with related denominators * add and subtract decimals * sequence whole numbers, fractions and decimals and describe the rule used * connect and convert metric units of length, mass and capacity * construct prisms and pyramids * revise and consolidate Year 5 concepts as required. | **Exemplar unit: The importance of zero**  During this term students will:   * revise and consolidate Term 1 concepts as required * use efficient mental and written strategies for all four operations with whole numbers * investigate positive and negative numbers * investigate fractions of a quantity * multiply and divide decimals by powers of ten * investigate order of operations * solve length and area problems * construct and interpret data displays * interpret secondary data. | During this term students will:   * revise and consolidate Terms 1 and 2 concepts as required * multiply decimals by whole numbers and perform divisions with terminating decimals * investigate fractions, decimals and percentage (equivalence) * calculate percentage discounts * investigate angles * describe probability (using fractions, decimals and percentage) * conduct chance experiments (observed and expected frequency). | During this term students will:   * revise and consolidate Terms 1, 2 and 3 concepts as required * connect volume and capacity * interpret and use timetables * investigate translations, reflections and rotations * be introduced to the Cartesian coordinate system. |

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| Teaching and learning | Aboriginal and Torres Strait Islander perspectives | Mathematics provides opportunities for students to strengthen their appreciation and understanding of Aboriginal peoples and Torres Strait Islander peoples and their living cultures. Specific content and skills within relevant sections of the curriculum can be drawn upon to encourage engagement with:   * Aboriginal and Torres Strait Islander frameworks of knowing and ways of learning * Social, historical and cultural contexts associated with different uses of mathematical concepts in Australian Indigenous societies * Aboriginal peoples’ and Torres Strait Islander peoples’ contributions to Australian society and cultures.   Mathematics provides opportunities to explore aspects of Australian Indigenous knowing in connection to, and with guidance from, the communities who own them. Using a respectful inquiry approach students have the opportunity to explore mathematical concepts in Aboriginal and Torres Strait Islander lifestyles including knowledge of number, space, measurement and time. Through these experiences, students have opportunities to learn that Aboriginal peoples and Torres Strait Islander peoples have sophisticated applications of mathematical concepts which may be applied in other peoples’ ways of knowing. | | | | | | | | |
| General capabilities and cross‑curriculum priorities | Opportunities to engage with:  gc_literacygc_numeracygc_ictgc_critical  cc_asia | | Opportunities to engage with:  gc_literacygc_numeracygc_ictgc_criticalgc_personal_social | | Opportunities to engage with:  gc_literacygc_numeracygc_ictgc_critical  cc_asia | | Opportunities to engage with:  gc_literacygc_numeracygc_ictgc_critical | | |
| Key to general capabilities and cross-curriculum priorities | gc_literacy Literacy  gc_numeracy Numeracy  gc_ict ICT capability  gc_critical Critical and creative thinking  gc_ethical Ethical behaviour  gc_personal_social Personal and social capability  gc_intercultural Intercultural understanding   Aboriginal and Torres Strait Islander histories and cultures  cc_asia Asia and Australia’s engagement with Asia  cc_sust Sustainability | | | | | | | | |
| Develop assessment | Assessment  For advice and guidelines on assessment, see [www.qsa.qld.edu.au](http://www.qsa.qld.edu.au) | A folio is a targeted selection of evidence of student learning and includes a range of responses to a variety of assessment techniques. A folio is used to make an overall on-balance judgment about student achievement and progress at appropriate points and informs the reporting process. | | | | | | | | |
| Term 1 | | Term 2 | | Term 3 | | Term 4 | | |
| Week | Assessment instrument | Week | Assessment instrument | Week | Assessment instrument | Week | Assessment instrument | |
| 1 | Initial assessment  Identify Year 6 consolidation needs and learning goals (e.g. KWL, teacher/student conference). | 3 | Supervised assessment: Short response (Written)  Solve problems related to:   * four operations * order of operations * multiplication and division of decimals by powers of ten. | 2 | Modelling and problem-solving task: Demonstration (Spoken/signed)  Calculate percentage discounts in practical situations. | 3 | | Supervised assessment: Short response (Written)  Interpret and use timetables. |
| 4–5 | Supervised assessment: Short response (Written)  Solve problems related to:   * addition and subtraction of fractions with a related denominator * special numbers * metric conversions. | 5–6 | Supervised assessment: Short response (Written)  Solve problems related to length, perimeter and area. | 4–5 | Mathematical investigation: Report (Written)  Conduct a chance experiment:   * collect data * analyse data * describe data using equivalent fractions, decimals and percentages. | 4–7 | | Mathematical investigation (Multimodal)  Investigate:   * coordinates on the Cartesian plane * angles, and use results to find unknown angles * translations, reflections and rotations. |
| 7–8 | Modelling and problem-solving task: Demonstration (Spoken/signed)  Construct 3-D objects. | 8–9 | Mathematical investigation (Multimodal)  Investigate the importance of zero, including data collection and presentation.  The assessment package *Goal difference* in the QSA Assessment Bank could be used in this unit. |  |  | 9 | | Supervised assessment: Short response (Written)  Solve problems related to volume and capacity. |
|  |  |  |  | **QCATs:** Identify the curriculum targeted by the QCAT and schedule its implementation appropriate to the sequence of learning. | | | | |
| Make judgments and use feedback | Moderation | Teachers develop tasks and plan units. | | Teachers develop tasks and plan units.  Teachers identify A–E samples before marking tasks, and moderate to ensure consistency of judgments.  Teachers co-mark tasks to ensure consistency of judgments.  Curriculum leaders randomly sample folios to check for consistency of judgments. | | Teachers develop tasks and plan units.  Teachers identify A–E samples before marking tasks, and moderate to ensure consistency of judgments.  Teachers co-mark tasks to ensure consistency of judgments.  Teachers moderate the QCATs to identify A–E samples to take to cluster moderation in Term 4. | | Teachers develop tasks and plan units.  Teachers identify A–E samples before marking tasks, and moderate to ensure consistency of judgments.  Curriculum leaders randomly sample folios to check for consistency of teacher judgments.  Teachers participate in cluster moderation of the QCATs. | | |

Year 6 Mathematics: review for balance and coverage of content descriptions

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| Number and Algebra | 1 | 2 | 3 | 4 |
| Number and place value | | | | |
| Identify and describe properties of prime, composite, square and triangular numbers  [(ACMNA122)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMNA122) | ✓ |  |  |  |
| Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers [(ACMNA123)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMNA123) |  | ✓ |  |  |
| Investigate everyday situations that use integers. Locate and represent these numbers on a number line [(ACMNA124)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMNA124) |  | ✓ |  |  |
| Fractions and decimals | | | | |
| Compare fractions with related denominators and locate and represent them on a number line [(ACMNA125)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMNA125) | ✓ |  |  |  |
| Solve problems involving addition and subtraction of fractions with the same or  related denominators [(ACMNA126)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMNA126) | ✓ |  |  |  |
| Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies [(ACMNA127)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMNA127) |  | ✓ |  |  |
| Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers [(ACMNA128)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMNA128) | ✓ |  |  |  |
| Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies [(ACMNA129)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMNA129) |  |  | ✓ |  |
| Multiply and divide decimals by powers of 10 [(ACMNA130)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMNA130) |  | ✓ |  |  |
| Make connections between equivalent fractions, decimals and percentages  [(ACMNA131)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMNA131) |  |  | ✓ |  |
| Money and financial mathematics | | | | |
| Investigate and calculate  percentage  discounts of 10%, 25% and 50% on sale items, with and without digital technologies [(ACMNA132)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMNA132) |  |  | ✓ |  |
| Patterns and algebra | | | | |
| Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence [(ACMNA133)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMNA133) | ✓ |  |  |  |
| Explore the use of brackets and order of operations to write number sentences [(ACMNA134)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMNA134) |  | ✓ |  |  |

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| **Measurement and Geometry** | **1** | **2** | **3** | **4** |
| Using units of measurement | | | | |
| Connect decimal representations to the metric system [(ACMMG135)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMMG135) | ✓ |  |  |  |
| Convert between common metric units of length, mass and capacity [(ACMMG136)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMMG136) | ✓ |  |  |  |
| Solve problems involving the comparison of lengths and areas using appropriate units  [(ACMMG137)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMMG137) |  | ✓ |  |  |
| Connect volume and capacity and their units of measurement [(ACMMG138)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMMG138) |  |  |  | ✓ |
| Interpret and use timetables [(ACMMG139)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMMG139) |  |  |  | ✓ |
| Shape | | | | |
| Construct simple prisms and pyramids  [(ACMMG140)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMMG140) | ✓ |  |  |  |
| Location and transformation | | | | |
| Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies [(ACMMG142)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMMG142) |  |  |  | ✓ |
| Introduce the Cartesian coordinate system using all four quadrants [(ACMMG143)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMMG143) |  |  |  | ✓ |
| Geometric reasoning | | | | |
| Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles [(ACMMG141)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMMG141) |  |  | ✓ |  |

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| **Statistics and Probability** | **1** | **2** | **3** | **4** |
| Chance | | | | |
| Describe probabilities using fractions, decimals and percentages [(ACMSP144)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMSP144) |  |  | ✓ |  |
| Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies [(ACMSP145)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMSP145) |  |  | ✓ |  |
| Compare observed frequencies across experiments with expected frequencies  [(ACMSP146)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMSP146) |  |  | ✓ |  |
| Data representation and interpretation | | | | |
| Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables [(ACMSP147)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMSP147) |  | ✓ |  |  |
| Interpret secondary data presented in digital media and elsewhere [(ACMSP148)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACMSP148) |  | ✓ |  |  |

Source: Australian Curriculum, Assessment and Reporting Authority (ACARA), *Australian Curriculum v3.0: Mathematics for Foundation–10*, <www.australiancurriculum.edu.au/Mathematics/Curriculum/F-10>.