Year 6 plan — Australian Curriculum: Science

Implementation year: School name:

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| Identify curriculum | Year level description(highlighted aspects indicate differences from the previous year level) | The *Science Inquiry Skills* and *Science as a Human Endeavour* strands are described across a two-year band. In their planning, schools and teachers refer to the expectations outlined in the Achievement Standard and also to the content of the *Science Understanding* strand for the relevant year level to ensure that these two strands are addressed over the two-year period. The three strands of the curriculum are interrelated and their content is taught in an integrated way. The order and detail in which the content descriptions are organised into teaching/learning programs are decisions to be made by the teacher.Over Years 3 to 6, students develop their understanding of a range of systems operating at different time and geographic scales. In Year 6, students explore how changes can be classified in different ways. They learn about transfer and transformations of electricity, and continue to develop an understanding of energy flows through systems. They link their experiences of electric circuits as a system at one scale, to generation of electricity from a variety of sources at another scale and begin to see links between these systems. They develop a view of Earth as a dynamic system, in which changes in one aspect of the system impact on other aspects; similarly they see that the growth and survival of living things are dependent on matter and energy flows within a larger system. Students begin to see the role of variables in measuring changes and learn how look for patterns and relationships between variables. They develop explanations for the patterns they observe, drawing on evidence. |
| Achievement standard | By the end of Year 6, students compare and [classify](http://www.australiancurriculum.edu.au/Glossary?a=S&t=classify) different types of [observable](http://www.australiancurriculum.edu.au/Glossary?a=S&t=observable) changes to [materials](http://www.australiancurriculum.edu.au/Glossary?a=S&t=materials). They [analyse](http://www.australiancurriculum.edu.au/Glossary?a=S&t=analyse) requirements for the transfer of electricity and describe how energy can be transformed from one form to another to generate electricity. They explain how natural events cause rapid change to the Earth’s surface. They describe and predict the effect of environmental changes on individual living things. Students explain how scientific knowledge is used in decision making and identify contributions to the development of science by people from a range of cultures.Students follow procedures to develop investigable questions and [design](http://www.australiancurriculum.edu.au/Glossary?a=S&t=design) [investigations](http://www.australiancurriculum.edu.au/Glossary?a=S&t=investigations) into simple cause-and-effect [relationships](http://www.australiancurriculum.edu.au/Glossary?a=S&t=relationships). They identify [variables](http://www.australiancurriculum.edu.au/Glossary?a=S&t=variables) to be changed and measured and describe potential safety risks when planning methods. They collect, organise and interpret their [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data), identifying where improvements to their methods or [research](http://www.australiancurriculum.edu.au/Glossary?a=S&t=research) could improve the [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data). They describe and [analyse](http://www.australiancurriculum.edu.au/Glossary?a=S&t=analyse) [relationships](http://www.australiancurriculum.edu.au/Glossary?a=S&t=relationships) in [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data) using graphic representations and construct [multi-modal texts](http://www.australiancurriculum.edu.au/Glossary?a=S&t=multi-modal+texts) to communicate ideas, methods and findings. |
| Source: Australian Curriculum, Assessment and Reporting Authority (ACARA), *Australian Curriculum v3.0: Science for Foundation–10*, <www.australiancurriculum.edu.au/Science/Curriculum/F-10>. |
| Teaching and learning | Term overview | Term 1 | Term 2 | Term 3 | Term 4 |
| Making changesDuring this term students investigate changes that can be made to materials and how these changes are classified as reversible or irreversible. They explore the effects of reversible and non-reversible reactions in everyday materials and how this is used to solve problems facing society.Students will:* review (from Year 5) changes of state caused by heating or cooling
* discuss the difference between reversible and irreversible changes to materials
* investigate changes of state caused by heating and cooling and why these are classified as reversible changes
* investigate changes to material such as burning, rusting and composting and why these are classified as irreversible changes
* collate observations using a range of representations
* explore how reversible changes are affected by the physical properties of materials
* design a criteria/key to classify a change as reversible or irreversible
* apply the designed criteria/key and then suggest refinements and improvements
* pose questions to guide fair and safe investigations about how everyday irreversible reactions, such as rusting and composting, can be stopped or slowed down
 | A sustainable planetDuring this term students investigate how energy from a variety of sources can be used to generate electricity. They investigate personal and community choices to use sustainable energy sources. Students will:* revise the concept of energy in the context of electricity
* investigate the need for a complete circuit to allow electrical flow
* explore features of electrical circuits and use the associated equipment safely
* identify energy transformations and transferences in electrical circuits and everyday electrical devices
* investigate the difference between electrical conductors and insulators
* collect and compare data on household electricity use and practices that consume electrical energy
* select methods to investigate how moving air and water can be used to generate electricity
* research why sustainable sources of energy are being considered by communities
* measure and/or record data from investigations that compare different sources of electricity
* communicate ideas, explanations and processes in a variety of ways.
 | Exemplar unit: Our changing worldDuring this term students explore ways in which scientific understanding can assist in the early detection of natural disasters and in minimising their impact. They will recognise that science can inform choices about where people live and how they manage natural disasters. Students will:* research major geological and extreme weather events both in Australia and neighbouring countries
* engage with local media about recent geological and extreme weather events
* create models to demonstrate the effect of sudden geological events
* describe how scientists (including meteorologists, seismologists and vulcanologists) gather evidence to predict the effect of, and measure, significant geological and weather events
* research the scientific work being conducted in various centres around the world to advance global disaster alerts and communications
* discuss how scientific information gathered from geological and weather events is used to inform the future decisions of communities
* communicate ideas, explanations and processes in a variety of ways.
 | Life on EarthDuring this term students, through the context of a local environment, investigate the relationship between the growth and survival of living things and the physical conditions of their environment. Students will:* review (from Year 4) that living things depend on the environment to survive
* predict the impact on living things in the local environment if the physical conditions were altered
* carry out fair investigations to compare data with predictions and develop explanations
* research organisms that live in extreme environments
* explore and collect data about the physical conditions of a local environment and investigate how they support the growth and survival of living things in the environment
* communicate ideas, explanations and processes in a variety of ways.
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| **Teaching and learning** |  | * make predictions, measure and record data from investigations, compare predictions with collected data and develop explanations
* communicate ideas, explanations and processes in a variety of ways.
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| Aboriginal and Torres Strait Islander perspectives | Science 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
* Indigenous contexts in which Aboriginal and Torres Strait Islander peoples live
* Aboriginal peoples’ and Torres Strait Islander peoples’ contributions to Australian society and cultures.

Science provides opportunities to explore aspects of Australian Indigenous knowing with connection to, and guidance from, the communities who own them. Using a respectful inquiry approach, students have the opportunity to explore non-Indigenous science interpretations of Aboriginal and Torres Strait Islander lifestyles including knowledge of natural phenomena; native flora and fauna; and land, water and waste management. Using an inquiry approach enables students to learn science in contexts that are valued by Aboriginal and Torres Strait Islander students, their peers and communities, acknowledging their values and approaches to learning. |
| General capabilities and cross‑curriculum priorities | Opportunities to engage with:Description: Description: gc_literacy Description: Description: gc_numeracy Description: Description: gc_ict Description: Description: gc_critical Description: Description: gc_ethical Description: Description: gc_personal_socialDescription: Description: cc_sust | Opportunities to engage with:Description: Description: gc_literacy Description: Description: gc_numeracy Description: Description: gc_ict Description: Description: Description: gc_critical Description: Description: gc_ethical Description: Description: gc_personal_socialDescription: Description: cc_sust | Opportunities to engage with:Description: Description: gc_literacy Description: Description: gc_ict Description: Description: gc_critical Description: Description: gc_ethical Description: Description: gc_personal_social Description: Description: gc_interculturalDescription: Description: cc_asiaDescription: Description: cc_sust | Opportunities to engage with:Description: Description: gc_literacy Description: Description: gc_numeracy Description: Description: gc_ict Description: Description: Description: gc_criticalDescription: Description: cc_sust |
| Key to general capabilities and cross-curriculum priorities | Description: Description: gc_literacy Literacy  Description: Description: gc_numeracy Numeracy  Description: Description: gc_ict ICT capability  Description: Description: gc_critical Critical and creative thinking  Description: Description: gc_ethical Ethical behaviour  Description: Description: gc_personal_social Personal and social capability  Description: Description: gc_intercultural Intercultural understanding Aboriginal and Torres Strait Islander histories and cultures  Description: cc_asia Asia and Australia’s engagement with Asia  Description: cc_sust Sustainability |
| Develop assessment | AssessmentFor 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 | Supervised assessment: Short response (Written)Identify current knowledge with a diagnostic tool at the beginning of the unit and use formatively to consolidate and build upon prior knowledge. | 2–10 | Collection of work (Written) * science journal entries
* investigation methods
* predictions
* graphs and tables
* labelled diagrams
* written explanations
* drawing conclusions
* science reports.
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* drawing conclusions
* improvements to methods
* science reports.
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| 2–5 | Collection of work (Written) * science journal entries
* investigation methods
* predictions
* graphs and tables
* labelled diagrams
* written explanations
* drawing conclusions
* improvements to methods
* science reports.
 | 7–10 | Experimental investigation: Model building and report (Multimodal)Create and demonstrate an electrical device that operates by converting solar energy into electrical energy. Explain:* the energy transferences and transformations that are occurring
* situations where the device could be a useful alternative.
 | 6–10 | Research: Interview (Multimodal)In pairs, plan and present an interview about a sudden geological event or extreme weather condition. At least one of the students must be an “expert” on the subject. The assessment package *Changing coastlines* in the QSA Assessment Bank could be used as assessment in this unit. | 6–8 | Research: Report (Written/Multimodal)Design a zoo for a selection of animals ensuring the physical conditions of the enclosure support the survival of the animals. The assessment package *Mouldy science* in the QSA Assessment Bank could be used as assessment in this unit. |

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| Develop assessment |  | 6–8 | Experimental investigation: Scientific report (Written)Collaboratively plan and conduct a fair investigation to explore how everyday irreversible reactions can be stopped or slowed down. The assessment package *Investigating Australian natural dyes* in the QSA Assessment Bank could be used as assessment in this unit. |  |  | **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 co-mark tasks to ensure consistency of judgments. | Teachers develop tasks and plan units.Teachers select representative folios and meet to ensure consistency of judgments before marking tasks. | Teachers develop tasks and plan units.Teachers select representative folios and meet to ensure consistency of judgments before marking tasks.Teachers choose a selection of the QCATs to calibrate. They moderate to ensure consistency of judgments. | Teachers develop tasks and plan units.Teachers co-mark tasks to ensure consistency of judgments.Teachers participate in school and cluster moderation of the QCATs. |

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

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| Science Understanding | 1 | 2 | 3 | 4 |
| Biological sciences |
| The growth and survival of living things are affected by the physical conditions of their environment [(ACSSU094)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU094) |  |  |  | ✓ |
| Chemical sciences |  |  |  |  |
| Changes to materials can be reversible, such as melting, freezing, evaporating; or irreversible, such as burning and rusting [(ACSSU095)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU095) | ✓ |  |  |  |
| Earth and space sciences |  |  |  |  |
| Sudden geological changes or extreme weather conditions can affect Earth’s surface [(ACSSU096)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU096) |  |  | ✓ |  |
| Physical sciences |  |  |  |  |
| Electrical circuits provide a means of transferring and transforming electricity [(ACSSU097)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU097) |  | ✓ |  |  |
| Energy from a variety of sources can be used to generate electricity [(ACSSU219)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU219) |  | ✓ |  |  |

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| Science as a Human Endeavour | 1 | 2 | 3 | 4 |
| Nature and development of science |
| Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena [(ACSHE098)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE098) |  |  | ✓ | ✓ |
| Important contributions to the advancement of science have been made by people from a range of cultures [(ACSHE099)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE099) |  |  | ✓ |  |
| Use and influence of science |  |  |  |  |
| Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples’ lives [(ACSHE100)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE100) | ✓ |  | ✓ |  |
| Scientific knowledge is used to inform personal and community decisions [(ACSHE220)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE220) | ✓ | ✓ | ✓ |  |

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| Science Inquiry Skills | 1 | 2 | 3 | 4 |
| Questioning and predicting |
| With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be [(ACSIS232)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS232) | ✓ | ✓ |  | ✓ |
| Planning and conducting |
| With guidance, plan appropriate investigation methods to answer questions or solve problems [(ACSIS103)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS103) | ✓ | ✓ |  | ✓ |
| Decide which variable should be changed and measured in fair tests and accurately observe, measure and record data, using digital technologies as appropriate [(ACSIS104)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS104) | ✓ |  |  | ✓ |
| Use equipment and materials safely, identifying potential risks [(ACSIS105)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS105) | ✓ | ✓ |  | ✓ |
| Processing and analysing data and information |
| Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate [(ACSIS107)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS107) | ✓ | ✓ | ✓ | ✓ |
| Compare data with predictions and use as evidence in developing explanations [(ACSIS221)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS221) | ✓ |  |  | ✓ |
| Evaluating |
| Suggest improvements to the methods used to investigate a question or solve a problem [(ACSIS108)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS108) | ✓ |  |  | ✓ |
| Communicating |
| Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts [(ACSIS110)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS110) | ✓ | ✓ | ✓ | ✓ |

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