

# Australian Curriculum: Science — Year 9

| CURRICULUM              | SEMESTER 1  |  | SEMESTER 2   |  |
|-------------------------|---|--|--|--|
|                         | Unit 1  | Unit 2   | Unit 3   | Unit 4   |
| <b>Unit name</b>        | Heat, Light and Sound Energy  | Rock cycle and Changing Earth  | Body Balance and the Environment   | Elements and Chemical Patterns   |
| <b>Unit description</b> | In this unit students examine, inquire and explain ways in which energy can be transferred through different mediums using the particle model. Students will have opportunities to form hypotheses and investigate quantitative and qualitative data and information on the flow of electrical energy and heat energy. They use these findings, scientific knowledge and prior understanding to form conclusions. Students will evaluate explanations and claims using scientific knowledge. They will assess energy efficiencies in house design and use of electrical appliances for heating and cooling to make informed decisions about the influence of science and technology on energy use. In this unit students will build on their knowledge of energy transfer to include the wave-based models of energy transfer related to sound and light. Students investigate wave motion and how different mediums affect sound and light transfer. They explore ways in which humans have used and controlled sound and light energy transfer for practical purposes. Students design and conduct investigations to transmit a form of energy through a medium using available equipment and materials. They analyse experimental and second-hand data and identify relationships within the data. Students explore the structure and use of musical instruments by Australia's First Peoples. | In this unit students explore the historical development of the theory of plate tectonics. They model and investigate geological processes involved in Earth movement. Students compare different types of tectonic plate boundaries and the tectonic events that occur at these boundaries. Students will critically evaluate the sources of their researched information. They explore technological developments that have aided scientists in the study of tectonic plate movement and consider how these assist societies living in tectonic-event areas. Students research the impact of tectonic events such as earthquakes, tsunamis and volcanoes on humans and describe where science and technology are contributing to the development of safer buildings. | In this unit, students identify human body systems and the ways in which they work together in balance to support life. They outline how the functions of the systems are coordinated to provide the essential requirements for life. Students analyse and predict the effects of the environment on body systems, and discuss how the body responds to changes in the environment and to diseases. They research the positive and negative aspects of vaccination and use evidence to justify decisions related to vaccination. Students consider current and future developments in vaccine technology and reflect on how the needs of society influence the focus of scientific research. Students evaluate from a scientific perspective and use appropriate language and representations when communicating their ideas and findings. In this unit students will explore the concepts of change and sustainability within an ecosystem. They will understand that all life is connected through ecosystems and changes to its balance can have an effect on the populations, interrelationships and the flow of matter and energy. Students will formulate questions, analyse data and develop related recommendations, including ethical considerations. They will investigate and reflect upon the state of Australian environments, locally and nationally, and their individual and collective responsibility for the sustainability of ecosystems. | In this unit students will explore the development of scientific ideas about atoms and their subatomic particles, protons, neutrons and electrons. They will investigate the structure and uses of isotopes and consider the processes and products of radioactive decay including radiation and half-life. Students will understand that scientific knowledge and ideas about the structure of atoms and isotopes has changed as new evidence has become available. They will research the use of radioisotopes in a range of areas of society and consider the impacts of these uses on society, including the technology and occupations resulting from these uses. In this unit students will engage in the exploration of chemical reactions and the application of these in living and non-living systems. They will understand that chemical change involves the rearranging of atoms to form new substances. Students will examine energy transfer in reactions, the nature and reactions of acids as well as the conservation of mass in chemical reactions. Students will engage in investigations that examine photosynthesis and respiration, ocean acidification and instant cold packs, which continue to develop their scientific inquiry skills. They will also explore the reliability of acid/base indicators made from natural plant pigments. They will assess risk, control variables, gather and analyse primary data, identify anomalies, evaluate methods and make recommendations to improve the quality of evidence. |

| ASSESSMENT   |                     | SEMESTER 1                                  |  | SEMESTER 2                  |                             |
|--|---------------------|---|--|-----------------------------|-----------------------------|
|  |                     | Summative assessment task 1                 | Summative assessment task 2                              | Summative assessment task 3 | Summative assessment task 4 |
| <b>Range and balance of summative assessment conventions</b>   | <b>Technique</b>    | Cool House Investigation                    | Research Investigation: Earth Quake, Eruption or Tsunami | End Unit Exam               | End of Unit Exam            |
|  | <b>Type of text</b> | Multi modal with Experimental Report        | Multi Modal  | Short and Extended Response | Short and Extended Response |
|  | <b>Mode</b>         | Experimenting and Scientific Report writing | Scientific Research Assignment                           | Student Responses           | Student Responses           |
|  | <b>Conditions</b>   | 4 weeks                                     | 4 weeks  | 1 x 70 min                  | 1 x 70 min class            |
| <b>Aspects of the achievement standard</b>   |                     |   |  |                             |                             |
| Students explain chemical processes and natural radioactivity in terms of atoms and energy transfers and describe examples of important chemical reactions |                     |   |  |                             |                             |
| They describe models of energy transfer and apply these to explain phenomena   |                     |   |  |                             |                             |
| They explain global features and events in terms of geological processes and timescales  |                     |   |  |                             |                             |
| They analyse how biological systems function and respond to external changes with reference to interdependencies, energy transfers and flows of matter     |                     |   |  |                             |                             |



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| They describe social and technological factors that have influenced scientific developments and predict how future applications of science and technology may affect people's lives.             |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Students design questions that can be investigated using a range of inquiry skills   |  |  |  |  |  |  |  |  |
| They design methods that include the control and accurate measurement of variables and systematic collection of data and describe how they considered ethics and safety                          |  |  |  |  |  |  |  |  |
| They analyse trends in data, identify relationships between variables and reveal inconsistencies in results  |  |  |  |  |  |  |  |  |
| They analyse their methods and the quality of their data, and explain specific actions to improve the quality of their evidence.   |  |  |  |  |  |  |  |  |
| They evaluate others' methods and explanations from a scientific perspective and use appropriate language and representations when communicating their findings and ideas to specific audiences. |  |  |  |  |  |  |  |  |

Shaded cells indicate opportunities that summative assessments provide for students to demonstrate evidence against all aspects of the achievement standard

