

## Year 9 Science (full year and semester students)

### Achievement

By the end of Year 9, 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 inter-dependencies, energy transfers and flows of matter. 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.

### Assessment Criteria

An overall level of achievement in this subject is determined by the teacher's on-balance judgment of the evidence presented in students' summative assessment across the following:

- **Science Understanding:** Biological Sciences, Chemical Sciences, Earth and Space Sciences, Physical Sciences.
- **Science as a Human Endeavour:** Nature and development of science, use and influence of science.
- **Science Inquiry Skills:** Questioning and predicting, Planning and conducting, Processing and analysing data and information, Evaluating, Communicating.

### Delivery (mode, time requirements, lessons)

Students have access to a one hour scheduled lesson and a one hour tutorial each week. Lessons are delivered via Collaborate and teleconferencing. Students are also expected to undertake independent study to complete tasks and assessment in accordance with the Work Rate Calendar. Course materials can be accessed in Blackboard.

### Student Requirements

Computer, access to internet, email, printer, scanner, telephone or headset with microphone, exercise book, stationery and the science kit.

## Year 9 Science (Semester 1)

		<b>Units and Learning Experiences, Summative Assessment, Criteria Assessed, Approximate timing/due date of summative assessment</b>
<b>Semester 1</b>	<b>Term 1</b>	<p><b>Physics unit: Energy on the move</b> Students examine, enquire and explain ways in which energy can be transferred through different mediums using the particle model. They will have opportunities to form hypotheses and investigate quantitative and qualitative data and information on the transfer of electrical energy and heat energy. Students will use their findings, scientific knowledge and prior understanding to form and support conclusions. They will design and conduct an investigation about energy transfer in home insulation and analyse data to draw conclusions about a factor that impacts on the effectiveness of an insulation material.</p>
		<p><b>Physics unit: Making waves</b> In this unit students build on their knowledge of energy transfer to include the wave-based model of energy transfer by considering sound and light energy types. They investigate wave motion and the variations to sound and light transfer caused by differing materials. Students explore ways in which humans have used and controlled sound and light energy transfer for practical purposes. They design investigations using available materials to transmit a form of energy through a medium.</p>
		<p><b>Summative assessment, criteria assessed, approximate timing/due date:</b></p> <ul style="list-style-type: none"> <li>• Task – investigating thermal insulation (Physical sciences, Questioning and predicting thermal insulation (Physical sciences, Questioning and predicting and Planning and conducting, Processing and analysing data and information, Evaluating, Communicating) Week 6.</li> <li>• Exam - The transfer of light and sound (Physical sciences, Planning and conducting, Processing and analysing data and information, Communicating).</li> </ul>
	<b>Term 2</b>	<p><b>Chemistry unit: It's elementary</b> Students will explore the development of scientific ideas about atoms and the subatomic particles; electrons, neutrons and protons. They will investigate isotopes and their uses and consider the process of radioactive decay and its products including radiation and half-life. Students engage in the exploration of chemical reactions and their application in everyday life. They investigate the application of the chemical concepts to methods used by Australian Indigenous people to detoxify food, food production and the use of acid/base indicators. Students design and conduct investigations, assess risk and gather first hand data. They analyse data, identifying inconsistencies and describe specific ways to improve the quality of data obtained in their investigations.</p>
		<p><b>Chemistry unit: Heat and Eat</b> Students explore chemical reactions and their applications in everyday life. They investigate the application of the chemical concepts to methods used by Australian Indigenous people to detoxify food, food production and the use of acid/base indicators. Students design and conduct investigations, assess risk and gather first hand data. They analyse data, identifying inconsistencies and describe specific ways to improve the quality of data obtained in their investigations.</p>
		<p><b>Summative assessment, criteria assessed, approximate timing/due date:</b></p> <ul style="list-style-type: none"> <li>• Experiment investigation - Heat and eat (Chemical sciences, Planning and conducting, Processing and analysing data and information, Evaluating, Communicating).</li> </ul>

## Year 9 Science (Semester 2)

		<b>Units and Learning Experiences, Summative Assessment, Criteria Assessed, Approximate timing/due date of summative assessment</b>
<b>Semester 2</b>	<b>Term 3</b>	<p><b>Biology unit: My life in balance</b> Students identify human body systems and the ways in which they work together in balance to support life. The outline how essential requirements for life are provided internally through a coordinated approach. Students analyse and predict the effects of the environment on body systems, and discuss the body's response 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.</p>
		<p><b>Biology unit: Responding to change</b> In this unit students explore concepts of change and sustainability within an ecosystem. They focus on the understanding that all life is connected through ecosystems and that changes the balance of ecosystems can have an effect on the populations and interrelationships that exist in it. The unit provides students with an opportunity to reflect upon the state of Australian environments, locally and nationally, and on individual and collective responsibility for the sustainability of ecosystems.</p>
		<p><b>Summative assessment, criteria assessed, approximate timing/due date:</b></p> <ul style="list-style-type: none"> <li>• Exam/Test – Body systems, vaccines and immunity (Biological sciences, Nature and development of science, Use and influence of science, Communicating).</li> <li>• Assignment/Project Evaluating the impact of change on an ecosystem (Biological sciences, Questioning and predicting, Planning and conducting, Processing and analysing data, Communicating).</li> </ul>
	<b>Term 4</b>	<p><b>Earth and space unit: Changing Earth</b> Students will explore the historical development of the scientific plate tectonic theory and consider how it has helped to understand our planet. They will investigate the geological processes that are believed to control Earth movements. Students will analyse data and evaluate how it provides evidence for the theory of plate tectonics. They will explore technological developments that have helped scientists study plate movement, and the impact on humans of events such as earthquakes, tsunamis and volcanoes.</p>
		<p>Exam – Plate tectonics (Earth and Space sciences, Nature and development of science, Processing and analysing data and information, Evaluating, Communicating).</p>

**Disclaimer** All of the above information is accurate at the time of development.