

# Year 8 Science Curriculum and assessment plan

## Example A

Level description	Context and cohort considerations
<p>In Year 8 students are introduced to cells as microscopic structures that explain macroscopic features of living systems. They connect form and function at an organ level and explore the organisation of a body system in terms of flows of matter between interdependent organs. They continue to develop a view of Earth as a dynamic system, in which change occurs across a range of timescales. They classify different types of energy and describe the role of energy in causing change in systems, including the role of energy and forces in the geosphere. They learn to classify matter at the atomic level and distinguish between chemical and physical change. They understand that chemical reactions also involve energy. Students use experimentation to isolate relationships between components in systems and explain these relationships through increasingly complex representations. They consider the magnitude of properties and events and use appropriate units to describe proportional relationships.</p> <p>Inquiry questions can help excite students' curiosity and challenge their thinking. Following are examples of inquiry questions that could be used to prompt discussion and exploration:</p> <ul style="list-style-type: none"> <li>• Can we predict changes to the shape and position of continents?</li> <li>• Are facts enough? How much does science communication matter?</li> <li>• How can we tell if a substance has changed?</li> <li>• How can we best measure what we cannot directly see?</li> <li>• How is a leaf like a lung?</li> </ul>	<p>Year 8 Science is taught in 3 x 70-minute lessons each week. Each Year 8 class has laboratory access for two lessons each week. Further access for Term 4 may be negotiated.</p> <p>Students have access to their own digital device and a shared laptop bank. Use of the textbook (digital or hardcopy) is encouraged.</p> <p>Teacher aides support practical activities.</p>

Unit 1 — Our future health: Biological sciences	Unit 2 — Energy alternatives: Physical sciences	Unit 3 — Useful rocks: Earth and space sciences	Unit 4 — Does it matter? Chemical sciences
Duration: 10 weeks	Duration: 10 weeks	Duration: 10 weeks	Duration: 10 weeks
<p>Innovative technologies are being developed to support healthy living. In this unit, students investigate how understanding our organs at a cellular level can inform research and development of augmented or artificial organs.</p> <p>They identify the relationships between cell organelle structure and function. They transfer this understanding of the relationship between structure and function to tissues, organs and systems, in both plants and animals.</p> <p>To demonstrate this understanding, students create a physical 2D or 3D model that illustrates how the impact of disease or injury disrupts the function of an organ or system. They practise critical and creative thinking while developing their model and they explore ethical issues as they reflect on the development of augmented and artificial organs.</p> <p>By working in groups, students may further develop leadership and conflict resolution capabilities needed for practical work in laboratories in future years.</p>	<p>As technologies to generate electricity are proposed to replace established technologies should the claims of 'most efficient' and 'green energy' be examined? Solar, wind, hydro and geothermal energy are all potential alternatives in Australia and data is available for students to evaluate these claims.</p> <p>Students expand their understanding of energy from Year 6 and electrical circuits by exploring different types of energy transfer and transformation through the context of power generation to meet our future needs, including through the use of sustainable design practices.</p> <p>Students use science inquiry skills to evaluate claims around the capacity of different electricity generation technologies to meet society's energy demands.</p>	<p>Australia has some of the oldest visible geological features in the world and the study of rock formation provides an opportunity to identify potential new uses for old rocks.</p> <p>Students research the evidence supporting the theory of plate tectonics and the role of plate tectonics in the rock cycle. They use this research to demonstrate how scientific knowledge changes over time, as new evidence emerges.</p> <p>In this unit, students compare the geological processes occurring in Australia with other more active geological regions. Students make links between the processes of rock formation and the properties and subsequent uses of the rocks produced. This understanding of the properties of rocks is extended through research into the traditional geological knowledge and uses of rocks by First Nations Australians.</p> <p>While exploring this traditional knowledge, students engage in discussions on the ethical access to and use of secondary knowledge and data.</p>	<p>The language of chemistry allows us to understand and describe, at a molecular level, exactly what is happening in the physical world. Discovering new medicines, nano materials and new energy sources is beneficial if the discovery can be shared. Considering how to predict and represent chemical reactions supports innovation. Discovering new medicines from plants and removing environmental pollutants are possible by using the shared language of chemistry.</p> <p>This unit builds on students' prior understanding of the differences between pure substances and mixtures. Students apply the conventions of using models, symbols and formula, to represent different types of matter.</p> <p>They use the language of chemistry to represent elements, molecules and compounds, and compare chemical and physical changes in chemical reactions including identifying when energy changes occur in reactions.</p> <p>The focus on science inquiry through experimental investigation continues to develop personal and social capability and prepares students for Year 9 Chemical science.</p>

Unit 1 — Our future health: Biological sciences		Unit 2 — Energy alternatives: Physical sciences		Unit 3 — Useful rocks: Earth and space sciences		Unit 4 — Does it matter? Chemical sciences	
Assessment 1 — Investigation	Term/week	Assessment 2 — Examination	Term/week	Assessment 3 — Investigation	Term/week	Assessment 4 — Experimental investigation	Term/week
<p><b>Description:</b> Students create a physical 2D or 3D model to demonstrate their understanding of how the function of an organ or system may be impacted by injury or disease. They present their findings on the role of specialised cells, organs and body systems.</p> <p><b>Technique:</b> Investigation <b>Mode:</b> Multimodal <b>Conditions:</b></p> <ul style="list-style-type: none"> <li>• individual response</li> <li>• 1–2 minutes</li> </ul>	Week 9	<p><b>Description:</b> Students analyse second-hand data on alternative energy sources and evaluate claims against the provided data.</p> <p><b>Technique:</b> Examination <b>Mode:</b> Written <b>Conditions:</b></p> <ul style="list-style-type: none"> <li>• 70 minutes, plus 10 minutes planning</li> <li>• supervised</li> </ul>	Week 9	<p><b>Description:</b> Students research the evidence base that informs current understanding of plate tectonics and rock formation and use this to annotate historical explanations of the developing tectonic plate theory.</p> <p><b>Technique:</b> Investigation <b>Mode:</b> Written <b>Conditions:</b></p> <ul style="list-style-type: none"> <li>• 500–600 words</li> </ul>	Week 9	<p><b>Description:</b> Students plan and conduct an experiment to investigate physical and chemical changes and show how they can be represented.</p> <p><b>Technique:</b> Experimental investigation <b>Mode:</b> Practical and written <b>Conditions:</b></p> <ul style="list-style-type: none"> <li>• group work</li> <li>• individual response</li> <li>• 500–600 words</li> </ul>	Week 9
<p>By the end of Year 8 students explain the role of specialised cell structures and organelles in cellular function and analyse the relationship between structure and function at organ and body system levels. They apply an understanding of the theory of plate tectonics to explain patterns of change in the geosphere. They explain how the properties of rocks relate to their formation and influence their use. They compare different forms of energy and represent transfer and transformation of energy in simple systems. They classify and represent different types of matter and distinguish between physical and chemical change. Students analyse how different factors influence the development of, and lead to changes in, scientific knowledge. They analyse the key considerations that inform scientific responses and how these responses impact society. They analyse the importance of science communication in shaping viewpoints, policies and regulations.</p> <p>Students plan and conduct safe, reproducible investigations to test relationships and explore models. They describe potential ethical issues and intercultural considerations needed for specific field locations or use of secondary data. They select and use equipment to generate and record data with precision. They select and construct appropriate representations to organise and process data and information. They analyse data and information to describe patterns, trends and relationships and identify anomalies. They identify assumptions and sources of error in methods and analyse conclusions and claims with reference to conflicting evidence and unanswered questions. They construct evidence-based arguments to support conclusions and evaluate claims. 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Moderation	<b>Consensus:</b> Refer to QCAA moderation advice on the QCAA website under the Assessment tab in the learning area.	<b>Calibration:</b> Refer to QCAA moderation advice on the QCAA website under the Assessment tab in the learning area.	<b>Consensus:</b> Refer to QCAA moderation advice on the QCAA website under the Assessment tab in the learning area.	<b>Consensus:</b> Refer to QCAA moderation advice on the QCAA website under the Assessment tab in the learning area.

Content descriptions	Units				Content descriptions	Units				Content descriptions	Units			
	1	2	3	4		1	2	3	4		1	2	3	4
<b>Science understanding</b>					<b>Science as a human endeavour</b>					<b>Science inquiry</b>				
<b>Biological sciences</b> recognise cells as the basic units of living things, compare plant and animal cells, and describe the functions of specialised cell structures and organelles AC9S8U01	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Nature and development of science</b> explain how new evidence or different perspectives can lead to changes in scientific knowledge AC9S8H01	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>Questioning and predicting</b> develop investigable questions, reasoned predictions and hypotheses to explore scientific models, identify patterns and test relationships AC9S8I01	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
analyse the relationship between structure and function of cells, tissues and organs in a plant and an animal organ system and explain how these systems enable survival of the individual AC9S8U02	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	investigate how cultural perspectives and world views influence the development of scientific knowledge AC9S8H02	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>Planning and conducting</b> plan and conduct reproducible investigations to answer questions and test hypotheses, including identifying variables and assumptions and, as appropriate, recognising and managing risks, considering ethical issues, and recognising key considerations regarding heritage sites and artefacts on Country/Place AC9S8I02	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Earth and space sciences</b> investigate tectonic activity including the formation of geological features at divergent, convergent and transform plate boundaries and describe the scientific evidence for the theory of plate tectonics AC9S8U03	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>Use and influence of science</b> examine how proposed scientific responses to contemporary issues may impact on society and explore ethical, environmental, social and economic considerations AC9S8H03	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	select and use equipment to generate and record data with precision, using digital tools as appropriate AC9S8I03	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
describe the key processes of the rock cycle, including the timescales over which they occur, and examine how the properties of sedimentary, igneous, and metamorphic rocks reflect their formation and influence their use AC9S8U04	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	explore the role of science communication in informing individual viewpoints and community policies and regulations AC9S8H04	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>Processing, modelling, and analysing</b> select and construct appropriate representations, including tables, graphs, models and mathematical relationships, to organise and process data and information AC9S8I04	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Physical sciences</b> classify different types of energy as kinetic or potential and investigate energy transfer and transformations in simple systems AC9S8U05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						analyse data and information to describe patterns, trends and relationships and identify anomalies AC9S8I05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Chemical sciences</b> classify matter as elements, compounds or mixtures and compare different representations of these, including 2-dimensional and 3-dimensional models, symbols for elements and formulas for molecules and compounds AC9S8U06	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>						<b>Evaluating</b> analyse methods, conclusions and claims for assumptions, possible sources of error, conflicting evidence, and unanswered questions AC9S8I06	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Content descriptions	Units				Content descriptions	Units				Content descriptions	Units			
compare physical and chemical changes and identify indicators of energy change in chemical reactions AC9S8U07	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>						construct evidence-based arguments to support conclusions or evaluate claims and consider any ethical issues and cultural protocols associated with using or citing secondary data or information AC9S8I07	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
										<b>Communicating</b> write and create texts to communicate ideas, findings and arguments for specific purposes and audiences, including selection of appropriate language and text features, using digital tools as appropriate AC9S8I08	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

General capabilities	Units			
	1	2	3	4
Critical and creative thinking	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Digital literacy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ethical understanding	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Intercultural understanding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Literacy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Numeracy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal and social capability	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Cross-curriculum priorities	Units			
	1	2	3	4
Aboriginal and Torres Strait Islander histories and cultures	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Asia and Australia's engagement with Asia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sustainability	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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