Prep–Year 10 Science

ACiQ | v9.0

Australian Curriculum Version 9.0: Sequence of achievement standards aspects

This resource provides a sequence of achievement standards aspects, for Prep–Year 10 Science, organised by strands and sub-strands.

By breaking each achievement standard into discrete aspects, the increasing complexity of the achievement standard can be seen across Prep–Year 10. This supports teachers to identify the knowledge, understanding and skills that come before and after the enrolled year level/band.

When planning teaching, learning and assessment, teachers can use this resource to:

- plan for the range of students within a single year level
- determine appropriate curriculum access points for all students
- better understand aspects of achievement standards through consideration of where they are introduced, their progression and where they conclude.

		Prep Students:	Year 1 Students:	Year 2 Students:	Year 3 Students:	Year 4 Students:	Year 5 Students:	Year 6 Students:	Year 7 Students:	Year 8 Students:	Year 9 Students:	Year 10 Students:
Science understanding	Biological sciences	group plants and animals based on external features	identify how living things meet their needs in the places they live	No related achievement standard aspect for Year 2.	classify and compare living and non-living things and different life cycles	identify the roles of organisms in a habitat and construct food chains	explain how the form and behaviour of living things enables survival	explain how changes in physical conditions affect living things	explain how biological diversity is ordered and organised represent flows of matter and energy in ecosystems and predict the effects of environmental changes	explain the role of specialised cell structures and organelles in cellular function analyse the relationship between structure and function at organ and body system levels	explain how body systems provide a coordinated response to stimuli describe how the processes of sexual and asexual reproduction enable survival of the species	explain the processes that underpin heredity and genetic diversity describe the evidence supporting the theory of evolution by natural selection
	Earth and space sciences	This aspect of the achievement standard begins in Year 1.	identify daily and seasonal changes and describe ways these changes affect their everyday life	identify celestial objects and describe patterns they observe in the sky	describe the observable properties of soils, rocks and minerals and describe their importance as resources	identify key processes in the water cycle and describe how water cycles through the environment	describe key processes that change Earth's surface	model the relationship between the sun and planets of the solar system and explain how the relative positions of Earth and the sun relate to observed phenomena on Earth	model cycles in the Earth-sun-moon system and explain the effects of these cycles on Earth phenomena	apply an understanding of the theory of plate tectonics to explain patterns of change in the geosphere explain how the properties of rocks relate to their formation and influence their use	explain how interactions within and between Earth's spheres affect the carbon cycle	sequence key events in the origin and evolution of the universe and describe the supporting evidence for the big bang theory describe trends in patterns of global climate change and identify causal factors
	Physical sciences	identify factors that influence the movement of objects	describe how different pushes and pulls change the motion and shape of objects	demonstrate how different sounds can be produced and describe the effect of sound energy on objects	identify sources of heat energy and examples of heat transfer and explain changes in the temperature of objects	identify forces acting on objects and describe their effect	identify sources of light and model the transfer of light to explain observed phenomena	identify the role of circuit components in the transfer and transformation of electrical energy	represent and explain the effects of forces acting on objects	compare different forms of energy and represent transfer and transformation of energy in simple systems	analyse energy conservation in simple systems and apply wave and particle models to describe energy transfer	explain how Newton's laws describe motion and apply them to predict motion of objects in a system

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Science as a human endeavour	Chemical sciences	describe the observable properties of the materials that make up objects	No related achievement standard aspect for Year 1.	identify ways to change materials without changing their material composition	classify solids and liquids based on observable properties and describe how to cause a change of state	relate the uses of materials to their properties	relate the particulate arrangement of solids, liquids and gases to their observable properties	classify and compare reversible and irreversible changes to substances	use particle theory to explain the physical properties of substances develop processes that separate mixtures	classify and represent different types of matter distinguish between physical and chemical change	explain observable chemical processes in terms of changes in atomic structure, atomic rearrangement and mass	explain patterns and trends in the periodic table predict the products of reactions and the effect of changing reactant and reaction conditions
	Nature and development of science	This aspect of the achievement standard begins in Year 3.			describe how people use data to develop explanations	explain the role of data in science inquiry	describe examples of collaboration leading to advances in science, and scientific knowledge that has changed over time	explain why science is often collaborative and describe different individuals' contributions to scientific knowledge	identify the factors that can influence development of and lead to changes in scientific knowledge	analyse how different factors influence development of and lead to changes in scientific knowledge	explain the role of publication and peer review in the development of scientific knowledge explain the relationship between science, technologies and engineering	analyse the importance of publication and peer review in the development of scientific knowledge analyse the relationship between science, technologies and engineering
	Use and influence of science	identify examples of people using observation and questioning to learn about the natural world	describe situations where they use science in their daily lives and identify examples of people making scientific predictions	describe how people use science in their daily lives and how people use patterns to make scientific predictions	identify solutions that use scientific explanations	identify solutions based on scientific explanations and describe the needs these meet	identify examples where scientific knowledge informs the actions of individuals and communities	describe how individuals and communities use scientific knowledge	explain how scientific responses are developed and can impact society explain the role of science communication in shaping viewpoints, policies and regulations	analyse the key considerations that inform scientific responses and how these responses impact society analyse the importance of science communication in shaping viewpoints, policies and regulations	analyse the different ways in which science and society are interconnected	analyse the key factors that influence interactions between science and society
Science inquiry	Questioning and predicting	pose questions and make predictions based on their experiences	pose questions to explore observations and make predictions based on experiences	pose questions to explore observed patterns or relationships and make predictions based on experience	pose questions to explore patterns and relationships and make predictions based on observations	pose questions to identify patterns and relationships and make predictions based on observations	plan safe investigations to identify patterns and relationships and make reasoned predictions*	plan safe, repeatable investigations to identify patterns and test relationships and make reasoned predictions*	plan and conduct safe, reproducible investigations to test relationships and aspects of scientific models*	plan and conduct safe, reproducible investigations to test relationships and explore models*	plan and conduct safe, reproducible investigations to test or identify relationships and models*	plan and conduct safe, valid and reproducible investigations to test relationships or develop explanatory models*
							*These aspects of the achievement standard also apply to the Planning and conducting sub-strand.					

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Planning and conducting	engage in investigations and make observations safely	follow safe procedures to make and record observations	suggest steps to be followed in an investigation and follow safe procedures to make and record observations	use scaffolds to plan safe investigations and fair tests	plan investigations using planning scaffolds, identify key elements of fair tests and describe how they conduct investigations safely	identify risks associated with investigations and key intercultural considerations when planning field work identify variables to be changed and measured	describe risks associated with investigations and key intercultural considerations when planning field work identify variables to be changed, measured and controlled	identify potential ethical issues and intercultural considerations required for field locations or use of secondary data	describe potential ethical issues and intercultural considerations needed for specific field locations or use of secondary data	describe how they have addressed any ethical and intercultural considerations when generating or using primary and secondary data	explain how they have addressed any ethical and intercultural considerations when generating or using primary and secondary data
				use familiar classroom instruments to make measurements	use simple procedures to make accurate formal measurements	use equipment to generate data with appropriate precision	use equipment to generate and record data with appropriate precision	use equipment to generate and record data with precision	select and use equipment to generate and record data with precision	select and use equipment to generate and record replicable data with precision	select equipment and use it efficiently to generate and record appropriate sample sizes and replicable data with precision
Processing, modelling and analysing	with guidance, represent observations and identify patterns	use provided tables and organisers to sort and order data and information and, with guidance, represent patterns	use provided tables and organisers to sort and order data and represent patterns in data	organise data and information using provided scaffolds and identify patterns and relationships	construct representations to organise data and information and identify patterns and relationships	construct representations to organise data and information and describe patterns, trends and relationships	construct representations to organise and process data and information and describe patterns, trends and relationships	select and construct appropriate representations to organise data and information	select and construct appropriate representations to organise and process data and information	select and construct appropriate representations to organise, process and summarise data and information	select and construct effective representations to organise, process and summarise data and information
								process data and information and analyse it to describe patterns, trends and relationships	analyse data and information to describe patterns, trends and relationships and identify anomalies	analyse and connect data and information to identify and explain patterns, trends, relationships and anomalies	analyse and connect a variety of data and information to identify and explain patterns, trends, relationships and anomalies
Evaluating	with guidance, compare their observations with their predictions	with guidance, compare observations with predictions and identify further questions	with guidance, compare their observations with those of others, identify whether their investigation was fair and identify further questions	compare their findings with those of others, explain how they kept their investigation fair, identify further questions and draw conclusions	compare their findings with those of others, assess the fairness of their investigation, identify further questions for investigation and draw conclusions	compare their methods and findings to those of others, identify possible sources of error in their investigation, pose questions for further investigation and draw reasoned conclusions	identify possible sources of error in their own and others' methods and findings, pose questions for further investigation and select evidence to support reasoned conclusions	identify possible sources of error in methods and identify unanswered questions in conclusions and claims	identify assumptions and sources of error in methods and analyse conclusions and claims with reference to conflicting evidence and unanswered questions	analyse the impact of assumptions and sources of error in methods and evaluate the validity of conclusions and claims	evaluate the validity and reproducibility of methods, and the validity of conclusions and claims

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									identify evidence to support their conclusions and construct arguments to support or dispute claims	construct evidence-based arguments to support conclusions and evaluate claims	construct logical arguments based on evidence to support conclusions and evaluate claims	construct logical arguments based on analysis of a variety of evidence to support conclusions and evaluate claims
	Communicating	share questions, predictions, observations and ideas about their experiences with others	use everyday vocabulary to communicate observations, findings and ideas	use everyday and scientific vocabulary to communicate observations, findings and ideas	communicate ideas and findings for an identified purpose, including using scientific vocabulary when appropriate	communicate ideas and findings for an identified audience and purpose, including using scientific vocabulary when appropriate	use language features that reflect their purpose and audience when communicating their ideas and findings	select and use language features effectively for their purpose and audience when communicating their ideas and findings	select and use language and text features appropriately for their purpose and audience when communicating their ideas and findings	select and use language and text features appropriately for their purpose when communicating their ideas, findings and arguments to specific audiences	select and use content, language and text features effectively to achieve their purpose when communicating their ideas, findings and arguments to specific audiences	select and use content, language and text features effectively to achieve their purpose when communicating their ideas, findings and arguments to diverse audiences

* indicates achievement standards aspect relating to two or more sub-strands

More information

If you would like more information, please visit the QCAA website www.qcaa.qld.edu.au or email the K–10 Curriculum and Assessment Branch at australiancurriculum@qcaa.qld.edu.au.