

# Year 9 standard elaborations — Australian Curriculum v9.0: Science

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## Purpose

The standards elaborations (SEs) support teachers to connect curriculum to evidence in assessment so that students are assessed on what they have had the opportunity to learn. The SEs can be used to:

- make consistent and comparable judgments, on a five-point scale, about the evidence of learning in a folio of student work across a year/band
- develop task-specific standards (or marking guides) for individual assessment tasks
- quality assure planning documents to ensure coverage of the achievement standard across a year/band.

## Structure

The SEs have been developed using the Australian Curriculum achievement standard. The achievement standard for Science describes what students are expected to know and be able to do at the end of each year. Teachers use the SEs during and at the end of a teaching period to make on-balance judgments about the qualities in student work that demonstrate the depth and breadth of their learning.

In Queensland, the achievement standard represents the C standard — a sound level of knowledge and understanding of the content, and application of skills. The SEs are presented in a matrix where the discernible differences and/or degrees of quality between each performance level are highlighted. Teachers match these discernible differences and/or degrees of quality to characteristics of student work to make judgments across a five-point scale.



## Year 9 Australian Curriculum: Science achievement standard

By the end of Year 9 students explain how body systems provide a coordinated response to stimuli. They describe how the processes of sexual and asexual reproduction enable survival of the species. They explain how interactions within and between Earth's spheres affect the carbon cycle. They analyse energy conservation in simple systems and apply wave and particle models to describe energy transfer. They explain observable chemical processes in terms of changes in atomic structure, atomic rearrangement and mass. Students explain the role of publication and peer review in the development of scientific knowledge and explain the relationship between science, technologies and engineering. They analyse the different ways in which science and society are interconnected.

Students plan and conduct safe, reproducible investigations to test or identify relationships and models. They describe how they have addressed any ethical and intercultural considerations when generating or using primary and secondary data. They select and use equipment to generate and record replicable data with precision. They select and construct appropriate representations to organise, process and summarise data and information. They analyse and connect data and information to identify and explain patterns, trends, relationships and anomalies. They analyse the impact of assumptions and sources of error in methods and evaluate the validity of conclusions and claims. They construct logical arguments based on evidence to support conclusions and evaluate claims. They select and use content, language and text features effectively to achieve their purpose when communicating their ideas, findings and arguments to specific audiences.

Source: Australian Curriculum, Assessment and Reporting Authority (ACARA), *Australian Curriculum Version 9.0 Science for Foundation–10*  
<https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/science/year-9>

## Year 9 Science standard elaborations

		A	B	C	D	E
		<b>The folio of student work contains evidence of the following:</b>				
Science understanding	Biological sciences	<u>thorough</u> explanation of how body systems provide a coordinated response to stimuli	<u>detailed</u> explanation of how body systems provide a coordinated response to stimuli	explanation of how body systems provide a coordinated response to stimuli	<u>description</u> of body systems that provide a coordinated response to stimuli	<u>identification</u> of a body system's coordinated response to stimuli
		<u>thorough</u> description of how the processes of sexual and asexual reproduction enable survival of the species	<u>detailed</u> description of how the processes of sexual and asexual reproduction enable survival of the species	description of how the processes of sexual and asexual reproduction enable survival of the species	description of how the processes of sexual or asexual reproduction enable survival of the species	description of how reproduction enables survival of the species

		A	B	C	D	E
	Earth and space sciences	<u>reasoned</u> explanation of how interactions within and between Earth's spheres affect the carbon cycle	<u>informed</u> explanation of how interactions within and between Earth's spheres affect the carbon cycle	explanation of how interactions within and between Earth's spheres affect the carbon cycle	<u>partial</u> explanation of how interactions within and between Earth's spheres affect the carbon cycle	<u>description</u> of the carbon cycle
	Physical sciences	<ul style="list-style-type: none"> <li>• <u>thorough</u> analysis of energy conservation in simple systems</li> <li>• <u>thorough</u> description of energy transfer through application of wave and particle models</li> </ul>	<ul style="list-style-type: none"> <li>• <u>detailed</u> analysis of energy conservation in simple systems</li> <li>• <u>detailed</u> description of energy transfer through application of wave and particle models</li> </ul>	<ul style="list-style-type: none"> <li>• analysis of energy conservation in simple systems</li> <li>• description of energy transfer through application of wave and particle models</li> </ul>	<ul style="list-style-type: none"> <li>• <u>partial</u> analysis of energy conservation in simple systems</li> <li>• description of energy transfer through application of wave <u>or</u> particle models</li> </ul>	<ul style="list-style-type: none"> <li>• <u>description</u> of energy conservation</li> <li>• <u>identification</u> of energy transfer</li> </ul>
	Chemical sciences	<u>thorough</u> explanation of observable chemical processes in terms of changes in atomic structure, atomic rearrangement and mass	<u>detailed</u> explanation of observable chemical processes in terms of changes in atomic structure, atomic rearrangement and mass	explanation of observable chemical processes in terms of changes in atomic structure, atomic rearrangement and mass	<u>description</u> of observable chemical processes in terms of changes in atomic structure, atomic rearrangement and mass	<u>description</u> of observable chemical processes
Science as a human endeavour	Nature and development of science	<ul style="list-style-type: none"> <li>• <u>considered</u> explanation of the role of publication and peer review in the development of scientific knowledge</li> <li>• <u>considered</u> explanation of the relationship between science, technologies and engineering</li> </ul>	<ul style="list-style-type: none"> <li>• <u>informed</u> explanation of the role of publication and peer review in the development of scientific knowledge</li> <li>• <u>informed</u> explanation of the relationship between science, technologies and engineering</li> </ul>	<ul style="list-style-type: none"> <li>• explanation of the role of publication and peer review in the development of scientific knowledge</li> <li>• explanation of the relationship between science, technologies and engineering</li> </ul>	<ul style="list-style-type: none"> <li>• <u>description</u> of the role of publication and peer review in science</li> <li>• <u>description</u> of the relationship between science, technologies and engineering</li> </ul>	<ul style="list-style-type: none"> <li>• <u>statement/s about</u> publication and peer review</li> <li>• <u>statement/s about</u> science, technologies <u>or</u> engineering</li> </ul>

		A	B	C	D	E
Science inquiry	Use and influence of science	<b>thorough</b> analysis of the different ways in which science and society are interconnected	<b>detailed</b> analysis of the different ways in which science and society are interconnected	analysis of the different ways in which science and society are interconnected	<b>description</b> of ways in which science and society are interconnected	<b>identification</b> of ways in which science and society are interconnected
	Questioning and predicting	<b>purposeful</b> planning of investigations to test or identify relationships and models	<b>plausible</b> planning of investigations to test or identify relationships and models	planning of investigations to test or identify relationships and models	planning of investigations to test or identify relationships and models, <b>with guidance</b>	planning of investigations to test or identify relationships and models, <b>with direction</b>
	Planning and conducting	<b>thorough</b> planning and conducting of safe, reproducible investigations	<b>detailed</b> planning and conducting of safe, reproducible investigations	planning and conducting of safe, reproducible investigations	planning and conducting of safe investigations	conducting of safe investigations
		<b>considered</b> description of how they have addressed any ethical and intercultural considerations when generating or using primary and secondary data	<b>informed</b> description of how they have addressed any ethical and intercultural considerations when generating or using primary and secondary data	description of how they have addressed any ethical and intercultural considerations when generating or using primary and secondary data	description of ethical and intercultural considerations when generating or using primary and secondary data	<b>identification</b> of ethical and intercultural considerations when generating or using primary and secondary data
	selection and use of equipment for the <b>purposeful</b> generation and recording of replicable data with precision	selection and use of equipment for the <b>effective</b> generation and recording of replicable data with precision	selection and use of equipment for the generation and recording of replicable data with precision	selection and use of equipment for the generation and recording of replicable data	use of equipment for the generation and recording of data	

		A	B	C	D	E
	Processing, modelling and analysing	selection and <b>purposeful</b> construction of appropriate representations to organise, process and summarise data and information	selection and <b>effective</b> construction of appropriate representations to organise, process and summarise data and information	selection and construction of appropriate representations to organise, process and summarise data and information	construction of representations to organise, process and summarise data and information	construction of representations to organise data and information
		<b>thorough</b> analysis and connection of data and information to: <ul style="list-style-type: none"> <li>identify patterns, trends, relationships and anomalies</li> <li>explain patterns, trends, relationships and anomalies</li> </ul>	<b>detailed</b> analysis and connection of data and information to: <ul style="list-style-type: none"> <li>identify patterns, trends, relationships and anomalies</li> <li>explain patterns, trends, relationships and anomalies</li> </ul>	analysis and connection of data and information to: <ul style="list-style-type: none"> <li>identify patterns, trends, relationships and anomalies</li> <li>explain patterns, trends, relationships and anomalies</li> </ul>	analysis and connection of data and information to identify patterns, trends, relationships <b>or</b> anomalies	connection of data and information to identify patterns, trends, relationships <b>or</b> anomalies
	Evaluating	<ul style="list-style-type: none"> <li><b>considered</b> analysis of the impact of assumptions and sources of error in methods</li> <li><b>considered</b> evaluation of the validity of conclusions and claims</li> <li><b>purposeful</b> construction of logical arguments based on evidence to support conclusions and evaluate claims</li> </ul>	<ul style="list-style-type: none"> <li><b>informed</b> analysis of the impact of assumptions and sources of error in methods</li> <li><b>informed</b> evaluation of the validity of conclusions and claims</li> <li><b>informed</b> construction of logical arguments based on evidence to support conclusions and evaluate claims</li> </ul>	<ul style="list-style-type: none"> <li>analysis of the impact of assumptions and sources of error in methods</li> <li>evaluation of the validity of conclusions and claims</li> <li>construction of logical arguments based on evidence to support conclusions and evaluate claims</li> </ul>	<ul style="list-style-type: none"> <li><b>description</b> of the impact of assumptions and sources of error in methods</li> <li><b>partial</b> evaluation of the validity of conclusions and claims</li> <li>construction of arguments based on evidence to support conclusions and evaluate claims</li> </ul>	<ul style="list-style-type: none"> <li><b>identification</b> of errors <b>or</b> assumptions in methods</li> <li><b>description</b> of the validity of conclusions and claims</li> <li>construction of arguments to support conclusions and evaluate claims</li> </ul>

	A	B	C	D	E
Communicating	selection and use of content, language and text features effectively to achieve their purpose for <u>considered</u> communication of their ideas, findings and arguments to specific audiences.	selection and use of content, language and text features effectively to achieve their purpose for <u>informed</u> communication of their ideas, findings and arguments to specific audiences.	selection and use of content, language and text features effectively to achieve their purpose when communicating their ideas, findings and arguments to specific audiences.	selection and use of content, language and text features to achieve their purpose when communicating their ideas, findings and arguments to audiences.	use of content, language <u>or</u> text features when communicating their ideas, findings and arguments to audiences.

<b>Key</b>	shading emphasises the <u>qualities that discriminate between the A–E descriptors</u>
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