

# Senior secondary

## Science



### Which subjects are available in the senior secondary Australian Curriculum: Science?

The Australian Curriculum: Science offers four senior secondary subjects:

**Biology** emphasises a systems approach to biological phenomena, connecting systems at sub-cellular scales to whole organisms systems and ecosystems, and exploring the relationships between structure and function, flows of matter and energy, and change and continuity.

**Chemistry** focuses on the big ideas of chemical structure and properties, energy and reaction, developing understanding of chemical models and theories and culminating in an exploration of system equilibrium and synthesis.

**Earth and Environmental Science** develops understanding of the Earth system model, and focuses on the formation, interaction and inter-dependencies of Earth's spheres, and how these interactions result in and impact Earth processes, environments and resources.

**Physics** focuses on building understanding of the key concepts, models and theories that enable explanation and prediction of physical systems. *Physics* emphasises how models and theories have been developed; how they are applied, particularly in a range of technologies; and how they have been challenged and reconceptualised over time.

### How are the senior secondary Australian Curriculum: Science subjects structured?

The senior secondary Australian Curriculum for each science subject specifies content and achievement standards:

- The content describes the knowledge, understanding and skills that are to be taught and learned within each subject.
- The achievement standards describe the quality of learning (the depth of understanding, extent of knowledge and sophistication of skill) expected of students who have studied the content for the subject.

The curriculum is designed to be taught over a two-year period. Each senior secondary subject is organised into four units with the final two units designed to be cognitively more challenging than the first two.

Content has been specified for each unit, and achievement standards are described for each pair of units (Units 1 and 2; Units 3 and 4).

The curriculum also includes a rationale and a set of aims for the subject, a description of how the subject is organised, how general capabilities and cross-curriculum priorities are represented, and a glossary of key terms.



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#### How do the senior secondary Science subjects align with the F-10 Australian Curriculum?

Each of the Australian Curriculum: Science subjects builds upon students' science knowledge, understanding and skills acquired from Foundation to Year 10 (F-10). In particular, the Science subjects continue to build students' *Science Inquiry Skills* and understanding of *Science as a Human Endeavour*, and each subject continues to develop the relevant 'key concepts' that structure the *Science Understanding* sub-strands in the F-10 Australian Curriculum: Science.

The senior secondary subjects continue to develop the general capabilities and cross-curriculum priorities introduced across Foundation to Year 10. Each subject includes a description of the opportunities for students to continue to develop their general capabilities and understanding of cross-curriculum priorities in ways that are relevant to the subject.

#### How do the senior secondary Science subjects relate to each other?

The four Australian Curriculum: Science subjects develop similar *Science Inquiry Skills* and understandings of *Science as a Human Endeavour*.

The *Science Understanding* content in each of the science subjects is complementary. Where similar science contexts are included across subjects, they are framed with the understanding and analytical approach of the particular discipline. For example, *Biology* and *Earth and Environmental Science* both explore environmental change, but *Biology* views this in terms of effects on individual organisms and ecosystem dynamics, and *Earth and Environmental Science* in terms of interactions between the Earth's spheres.

The strong connections between the four science subjects also encourage students to appreciate the multi-disciplinary studies and/or careers that characterise contemporary science.

#### What are the Mathematics demands of the senior secondary Science subjects?

The content in each science subject has been developed with the assumption that students have achieved the Year 10 achievement standard for the Australian Curriculum: Mathematics, and have developed appropriate numeracy skills through the *Science Inquiry Skills* strand of the F-10 Australian Curriculum: Science.

Where additional mathematics requirements (beyond those of the Year 10 achievement standard) have been identified, these are highlighted in the Organisation section as requiring explicit teaching.

#### How do the senior secondary Science subjects differ from those in states and territories?

ACARA continues to work with each of the state and territory curriculum, assessment and certification authorities to determine how senior secondary courses are aligned with their local courses in terms of content, achievement standards and the timeline for implementation.

For further information contact your local authority. Link to state and territory authorities here:

<b>ACT</b>	<a href="#">ACT Board of Senior Secondary Studies</a>
<b>NSW</b>	<a href="#">NSW Education Standards Authority</a>
<b>NT</b>	<a href="#">Northern Territory Board of Studies</a>
<b>Qld</b>	<a href="#">Queensland Curriculum and Assessment Authority</a>
<b>SA</b>	<a href="#">SACE Board of South Australia</a>
<b>Tas.</b>	<a href="#">Office of Tasmanian Assessment, Standards and Certification</a>
<b>Vic.</b>	<a href="#">Victorian Curriculum and Assessment Authority</a>
<b>WA</b>	<a href="#">School Curriculum and Standards Authority</a>

#### Which national and international research was drawn upon to develop the senior secondary Science subjects?

In developing the senior secondary Australian Curriculum for Science, ACARA reviewed national and international science curricula, including those of Canada (Ontario), New Zealand, Singapore, and the United Kingdom. ACARA's work was further guided by key national and international research.

As part of ACARA's curriculum development process and its focus on quality curriculum, the senior secondary Australian Curriculum subjects were reviewed by international experts and curriculum authorities from around Australia.

