The Australian Curriculum

Draft Senior Secondary Science - Frequently Asked Questions

What are the subjects in the senior secondary Australian Curriculum for science?

There are four senior secondary subjects for Science as part of the Australian Curriculum:

- Biology
- Chemistry
- Earth and Environmental Science
- Physics

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, synthesis and analysis.

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 do the draft senior secondary Science subjects follow on from the F-10 Australian Curriculum?

Each of the senior secondary Science subjects builds upon students' Science knowledge, understanding and skills acquired up from Foundation to Year 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.

How do the draft senior secondary Science subjects differ from senior secondary science courses in states and territories?

The draft senior secondary Science subjects contain similar content to that of senior secondary Science courses in Australian states and territories.

The draft senior secondary Science subjects place a greater emphasis on explicit teaching of *Science as a Human Endeavour* compared to some states and territories.

As states and territories have continuing responsibility for pedagogy, assessment and reporting, Science courses in states and territories may also include detailed eligibility requirements and assessment information, such as the inclusion of an extended scientific investigation.

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The Australian Curriculum

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

The four draft senior secondary science subjects all develop a similar suite of *Science Inquiry Skills* and understandings of *Science as a Human Endeavour*, contextualised within the particular discipline.

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 techniques of the particular discipline. For example, *Biology*, *Chemistry* and *Earth and Environmental Science* all explore environmental change, but *Biology* views this in terms of effects on individual organisms and ecosystem dynamics, *Chemistry* in terms of chemical systems, 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 draft secondary Science subjects?

The content in each draft secondary 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 in Physics and Chemistry, these are highlighted in the Organisation section as requiring explicit teaching.

What national and international curricula and research was drawn upon to develop the draft senior secondary Science subjects?

The senior secondary Science documents available in all Australian states and territories were considered when developing the draft senior secondary Australian Curriculum for Science.

Key international and national references that have guided the development of the senior secondary Science subjects included:

- Science curriculum from the United Kingdom, the United States, Ontario and New Zealand
- International Baccalaureate Diploma subjects in the sciences
- *A Framework for K-12 Science Education: Practices, Crosscutting Concepts and Core Ideas* (Committee on Conceptual Framework for the New K-12 Science Education Standards; National Research Council, USA, 2012).
- *The Status and Quality of Year 11 and 12 Science in Australian Schools* (Goodrum et al, Australian Academy of Science, 2012).
- *Australian School Science Education National Action Plan 2008* – 2012 (Goodrum & Rennie, 2007).
- *Re-imagining Science Education: Engaging students in science for Australia's future* (Tytler, 2007).

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