

Alignment with the Australian Curriculum: Science

This *Change detectives* unit embeds all three strands of the Australian Curriculum: Science. The table below lists sub-strands and their content for Year 6. This unit is designed to be taught in conjunction with other Year 6 units to cover the full range of the Australian Curriculum: Science content for Year 6.

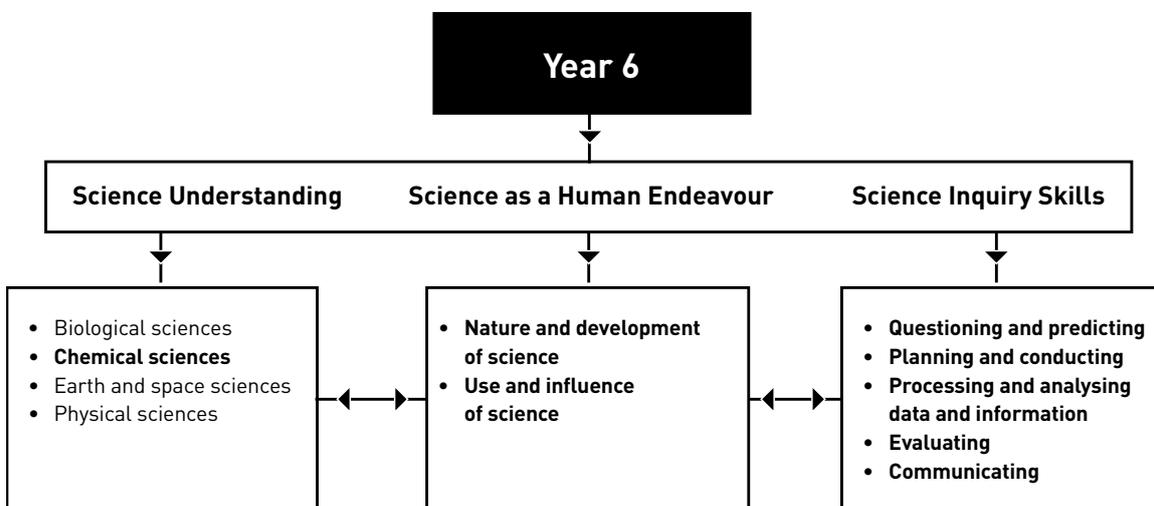
For ease of assessment the table below outlines the sub-strands and their aligned lessons.

Strand	Sub-strand	Code	Year 6 content descriptions	Lessons
Science Understanding (SU)	Chemical sciences	ACSSU095	Changes to materials can be reversible, such as melting, freezing, evaporating; or irreversible, such as burning and rusting	1, 2, 3, 4, 5, 7
Science as a Human Endeavour (SHE)	Use and influence of science	ACSHE100	Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples' lives	5, 7
Science Inquiry Skills (SIS)	Questioning and predicting	AC SIS232	With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be	2, 3, 6
		AC SIS103	With guidance, plan appropriate investigation methods to answer questions or solve problems	6
		AC SIS104	Decide which variable should be changed and measured in fair tests and accurately observe, measure and record data, using digital technologies as appropriate	3, 6
		AC SIS105	Use equipment and materials safely, identifying potential risks	3, 4, 6
	Processing and analysing data and information	AC SIS107	Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate	2, 3, 4, 6
		AC SIS221	Compare data with predictions and use as evidence in developing explanations	3, 6
	Evaluating	AC SIS108	Suggest improvements to the methods used to investigate a question or solve a problem	6
	Communicating	AC SIS110	Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts	1, 7

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Interrelationship of the science strands

The interrelationship between the three strands—Science Understanding, Science as a Human Endeavour and Science Inquiry Skills—and their sub-strands is shown below. Sub-strands covered in this unit are in bold.



Relationship to overarching ideas

In the Australian Curriculum: Science, six overarching ideas support the coherence and developmental sequence of science knowledge within and across year levels.

In *Change detectives*, these overarching ideas are represented by:

Overarching idea	Incorporation in <i>Change detectives</i>
Patterns, order and organisation	Students investigate and classify physical and chemical changes to materials. They develop explanations for the patterns they observe, drawing on evidence.
Form and function	Students role-play the movement of particles to represent their understanding of the effect of temperature on phase changes. They explore the usefulness of materials as related to their state, for example, a solid or a liquid form at room temperature.
Stability and change	Students investigate how heating or cooling causes change. They identify reversible and irreversible changes through hands-on activities. They investigate factors that influence the rate of change of a reaction.
Scale and measurement	Students make observations and represent their findings about changes using line graphs. They consider how materials are composed at a particle level using marbles to represent particles in a model of a substance.
Matter and energy	Students describe reversible and irreversible changes and the factors that affect such changes, for example, the addition or removal of heat energy.
Systems	Students explore the interrelationship between the production of new substances and the consumption of original substances during a chemical change.

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Curriculum focus

The Australian Curriculum: Science is described by year level, but provides advice across four year groupings on the nature of learners. Each year grouping has a relevant curriculum focus.

Curriculum focus Years 3–6	Incorporation in <i>Change detectives</i>
Recognising questions that can be investigated scientifically and investigating them	Students formulate a testable question with guidance and make predictions about what factors affect the speed of a chemical reaction. They plan and conduct a fair test of a chemical reaction and identify patterns in their findings.

Achievement standards

The achievement standards of the Australian Curriculum: Science indicates the quality of learning that students typically demonstrate by a particular point in their schooling, for example, at the end of a year level. These standards will be reviewed regularly by ACARA and are available from the ACARA website.

By the end of the unit, teachers will be able to make evidence-based judgements on whether the students are achieving below, at or above the Australian Curriculum: Science Year 6 achievement standard. Rubrics to help teachers make these judgements will be available on the website (www.science.org.au/primaryconnections).

General capabilities

The skills, behaviours and attributes that students need to succeed in life and work in the 21st century have been identified in the Australian Curriculum as general capabilities. There are seven general capabilities and they are embedded throughout the units. For further information see: www.australiancurriculum.edu.au

For examples of our unit-specific general capabilities information see the next page.

Change detectives—Australian Curriculum general capabilities

General capabilities	Australian Curriculum description	Change detectives examples
Literacy	<p>Literacy knowledge specific to the study of science develops along with scientific understanding and skills.</p> <p>Primary Connections learning activities explicitly introduce literacy focuses and provide students with the opportunity to use them as they think about, reason and represent their understanding of science.</p>	<p>In <i>Change detectives</i> the literacy focuses are:</p> <ul style="list-style-type: none"> • science journal • summaries • reports • word walls • tables • role-plays • procedural texts • graphs • Venn diagrams.
 Numeracy	<p>Elements of numeracy are particularly evident in Science Inquiry Skills. These include practical measurement and the collection, representation and interpretation of data.</p>	<p>Students:</p> <ul style="list-style-type: none"> • Use measurement (volume, capacity and time) • calculate averages • collect, interpret and represent data through tables and graphs • use measurement equipment appropriately (timer, cup measure, teaspoon measure).
Information and communication technology (ICT) competence	<p>ICT competence is particularly evident in Science Inquiry Skills. Students use digital technologies to investigate, create, communicate, and share ideas and results.</p>	<p>Students are given optional opportunities to:</p> <ul style="list-style-type: none"> • use a digital camera to record the mess scene images • use online digital resources to explore dissolving • create a digital Venn diagram • create a digital report.
 Critical and creative thinking	<p>Students develop critical and creative thinking as they speculate and solve problems through investigations, make evidence-based decisions, and analyse and evaluate information sources to draw conclusions. They develop creative questions and suggest novel solutions.</p>	<p>Students:</p> <ul style="list-style-type: none"> • brainstorm variables for investigations • devise testable questions • respond to teacher questions • discuss initial ideas • create classification groupings.
Ethical behaviour	<p>Students develop ethical behaviour as they explore principles and guidelines in gathering evidence and consider the implications of their investigations on others and the environment.</p>	<p>Students:</p> <ul style="list-style-type: none"> • respect each other's ideas during discussions.
 Personal and social competence	<p>Students develop personal and social competence as they learn to work effectively in teams, develop collaborative methods of inquiry, work safely, and use their scientific knowledge to make informed choices.</p>	<p>Students:</p> <ul style="list-style-type: none"> • identify ways to reduce risk and follow safety rules in the classroom during investigations • work in collaborative learning teams performing a role and practising team skills • discuss individual results with other team members • role-play science phenomena with other members of the class.
 Intercultural understanding	<p>Intercultural understanding is particularly evident in Science as a Human Endeavour. Students learn about the influence of people from a variety of cultures on the development of scientific understanding.</p>	<ul style="list-style-type: none"> • 'Cultural perspectives' opportunities are highlighted where relevant • Important contributions made to science by people from a range of cultures are highlighted where relevant.

Cross-curriculum priorities

There are three cross-curriculum priorities identified by the Australian Curriculum:

- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability.

For further information see: www.australiancurriculum.edu.au



Aboriginal and Torres Strait Islander histories and cultures

The PrimaryConnections Indigenous perspectives framework supports teachers' implementation of Aboriginal and Torres Strait Islander histories and cultures in science. The framework can be accessed at: www.science.org.au/primaryconnections

Change Detectives focuses on the Western science way of making evidence-based claims about the way objects change, whether physically, chemically or through the gaining or losing of heat energy to cause a change of state.

Aboriginal and Torres Strait Islander Peoples might have other explanations for the observed phenomenon of materials changing from liquids to solids or vice versa.

PrimaryConnections recommends working with Aboriginal and Torres Strait Islander community members to access local and relevant cultural perspectives. Protocols for engaging with Aboriginal and Torres Strait Islander community members are provided in state and territory education guidelines. Links to these are provided on the PrimaryConnections website.

Sustainability

In the *Change detectives* unit students learn about how changes to materials can be reversible or irreversible. This provides opportunities for students to understand why and how substances change and how the world is made up of constantly moving particles. A deeper understanding of the composition of everyday materials and the factors that influence change can assist them to develop knowledge, skills and values for making decisions about individual and community actions that contribute to sustainable patterns of use of the Earth's natural resources.

Alignment with the Australian Curriculum: English and Mathematics

Strand	Sub-strand	Code	Year 6 content descriptions	Lessons
English– Language	Language for interaction	ACELA1516	Understand that strategies for interaction become more complex and demanding as levels of formality and social distance increase	1, 5, 7
		ACELA1517	Understand the uses of objective and subjective language and bias	7
	Expressing and developing ideas	ACELA1524	Identify and explain how analytical images like figures, tables, diagrams, maps and graphs contribute to our understanding of verbal information in factual and persuasive texts	2, 3, 4, 5, 7
		ACLEA1526	Understand how to use banks of known words, word origins, base words, suffixes and prefixes, morphemes, spelling patterns and generalisations to learn and spell new words, for example technical words and words adopted from other languages	1, 7
English– Literature	Literature and context	ACELT1613	Make connections between students' own experiences and those of characters and events represented in texts drawn from different historical, social and cultural contexts	1
	Creating literature	ACELT1618	Create literary texts that adapt or combine aspects of text students have experienced in innovative ways	1
		ACELT1800	Experiment with text structures and language features and their effects in creating literary texts, for example, using imagery, sentence variation, metaphor and word choice	1

Strand	Sub-strand	Code	Year 6 content descriptions	Lessons
English–Literacy	Interacting with others	ACELY1709	Participate in and contribute to discussions, clarifying and interrogating ideas, developing and supporting arguments, sharing and evaluating information, experiences and opinions	2, 3, 4, 5, 6, 7
		ACELY1816	Use interaction skills, varying conventions of spoken interactions such as voice volume, tone, pitch and pace, according to group size, formality of interaction and needs and expertise of the audience	2, 3, 4, 5, 6, 7
	Interpreting, analysing, evaluating	ACELY1711	Analyse how text structures and language features work together to meet the purpose of a text	1, 7
		ACELY1801	Analyse strategies authors use to influence readers	7
English–Literacy (continued)	Creating texts	ACELY1714	Plan, draft and publish imaginative, informative and persuasive texts, choosing and experimenting with text structures, language features, images and digital resources appropriate to purpose and audience	7
		ACELY1715	Reread and edit students' own and others' work using agreed criteria and explaining editing choices	7
		ACELY1716	Develop a handwriting style that is legible, fluent and automatic and varies according to audience and purpose	7
		ACELY1717	Use a range of software, including word processing programs, learning new functions as required to create texts	7
Mathematics–Measurement and Geometry	Using units of measurement	ACMMG138	Connect volume and capacity and their units of measurement	3, 4
Mathematics–Statistics and Probability	Data representation and interpretation	ACMSP147	Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables	3, 4
		ACMSP148	Interpret data presented in digital media and elsewhere	3, 4
	Chance	ACMSP146	Compare observed frequencies across experiments with expected frequencies	6

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Other links are highlighted at the end of lessons where possible. These links will be revised and updated on the website (www.science.org.au/primaryconnections).