

Alignment with the Australian Curriculum: Science

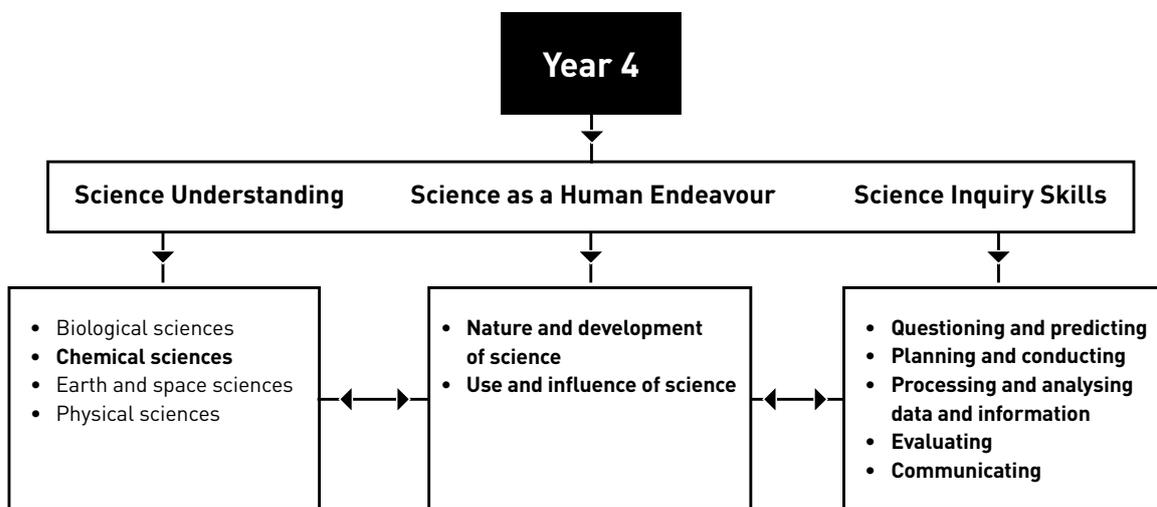
This *Material world* unit embeds all three strands of the Australian Curriculum: Science. The table below lists sub-strands and their content for Year 4. This unit is designed to be taught in conjunction with other Year 4 units to cover the full range of the Australian Curriculum: Science content for Year 4.

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

Strand	Sub-strand	Code	Year 4 content descriptions	Lessons
Science Understanding (SU)	Chemical sciences	ACSSU074	Natural and processed materials have a range of physical properties; These properties can influence their use	1–7
Science as a Human Endeavour (SHE)	Nature and development of science	ACSHE061	Science involves making predictions and describing patterns and relationships	1–7
	Use and influence of science	ACSHE062	Science knowledge helps people to understand the effect of their actions	1, 2, 3, 4, 5, 7
Science Inquiry Skills (SIS)	Questioning and predicting	ACSIS064	With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge	2, 3, 4, 6
	Planning and conducting	ACSIS065	Suggest ways to plan and conduct investigations to find answers to questions	6
		ACSIS066	Safely use appropriate materials, tools or equipment to make and record observations, using formal measurements and digital technologies as appropriate	2, 3, 4, 6
	Processing and analysing data and information	ACSIS068	Use a range of methods including tables and simple column graphs to represent data and to identify patterns and trends	2, 3, 4, 6
		ACSIS216	Compare results with predictions, suggesting possible reasons for findings	4, 6
	Evaluating	ACSIS069	Reflect on the investigation; including whether a test was fair or not	2, 3, 4, 6
	Communicating	ACSIS071	Represent and communicate ideas and findings in a variety of ways such as diagrams, physical representations and simple reports	1, 6, 7

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 *Material world* these overarching ideas are represented by:

Overarching idea	Incorporation in <i>Material world</i>
Patterns, order and organisation	Students conduct repeat fair tests and look for patterns in results to inform their choices of materials for particular purposes.
Form and function	Students investigate the physical properties of materials and their suitability for particular uses.
Stability and change	Students explore how the speed of decomposition of a material depends on environmental conditions and their chemical nature.
Scale and measurement	Students use formal units of measurement and equipment to measure the temperature of water to decide if materials are good insulators.
Matter and energy	Students identify physical properties used by scientists to identify the suitability of materials used to make clothes and bags.
Systems	Students consider the environmental effects of using recycled materials and plastics for making bags.

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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>Material world</i>
<p>Recognising questions that can be investigated scientifically and investigating them</p>	<p>Students use fair tests to investigate decomposition, absorbency, tensile strength and thermal insulation capacity of materials and develop explanations based on their results.</p>

Achievement standards

The achievement standards of the Australian Curriculum: Science indicate 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 this unit, teachers will be able to make evidence-based judgments on whether the students are achieving below, at or above the Australian Curriculum: Science Year 4 achievement standard. Rubrics to help teachers make these judgments 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 unit-specific information see the next page. For further information see:

www.australiancurriculum.edu.au

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

Material world—Australian Curriculum general capabilities

General capabilities	Australian Curriculum description	Material world 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>Material world</i> the literacy focuses are:</p> <ul style="list-style-type: none"> • science journals • word walls • glossaries • annotated drawings • tables • role-plays • factual texts • graphs.
 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"> • record results in a table • use a tally system • use a thermometer accurately • record findings in a graph.
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 observations.
 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"> • give reasons for choices • predict and give reasons for predictions • discuss ideas • brainstorm variables • give possible solutions • analyse and compare graphs.
Ethical behaviour	<p>Students develop ethical behaviour as they explore ethical principles and guidelines in gathering evidence and consider the ethical implications of their investigations on others and the environment.</p>	<p>Students:</p> <ul style="list-style-type: none"> • ask questions respecting each other's point of view • discuss the environmental implications of using plastics.
 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"> • participate in discussions • work collaboratively in teams • use equipment safely.
 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

Material world focuses on the Western science way of making evidence-based claims about the way materials have properties that influence their use.

Aboriginal and Torres Strait Islander Peoples might have other explanations for the observed phenomenon of physical properties of natural and processed materials.

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

The *Material world* unit provides opportunities for students to develop an understanding of how natural and processed materials have different physical properties that affect their use. People combine materials to make them more useful and scientists develop new materials based on their properties. This can assist students 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 4 content descriptions	Lessons
English– Language	Language for interaction	ACELA1488	Understand that social interactions influence the way people engage with ideas and respond to others for example when exploring and clarifying the ideas of others, summarising their own views and reporting them to a larger group	1, 2, 4, 6, 7
		ACELA1489	Understand differences between the language of opinion and feeling and the language of factual reporting or recording	1, 2, 4, 6, 7
	Expressing and developing ideas	ACELA1498	Incorporate new vocabulary from a range of sources into students' own texts including vocabulary encountered in research	1–7
English– Literacy	Interacting with others	ACELY1688	Use interaction skills such as acknowledging another's point of view and linking students' response to the topic, using familiar and new vocabulary and a range of vocal effects such as tone, pace, pitch and volume to speak clearly and coherently	1, 2, 4, 6, 7
		ACELY1689	Plan, rehearse and deliver presentations incorporating learned content and taking into account the particular purposes and audiences	5
Mathematics– Measurement and Geometry	Using units of measurement	ACMMG084	Use scaled instruments to measure and compare lengths, masses, capacities and temperatures	6
Mathematics– Statistics and Probability	Data representation and interpretation	ACMSP096	Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data values	2, 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).