

Alignment with the Australian Curriculum: Science

This *Essential energy* 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.

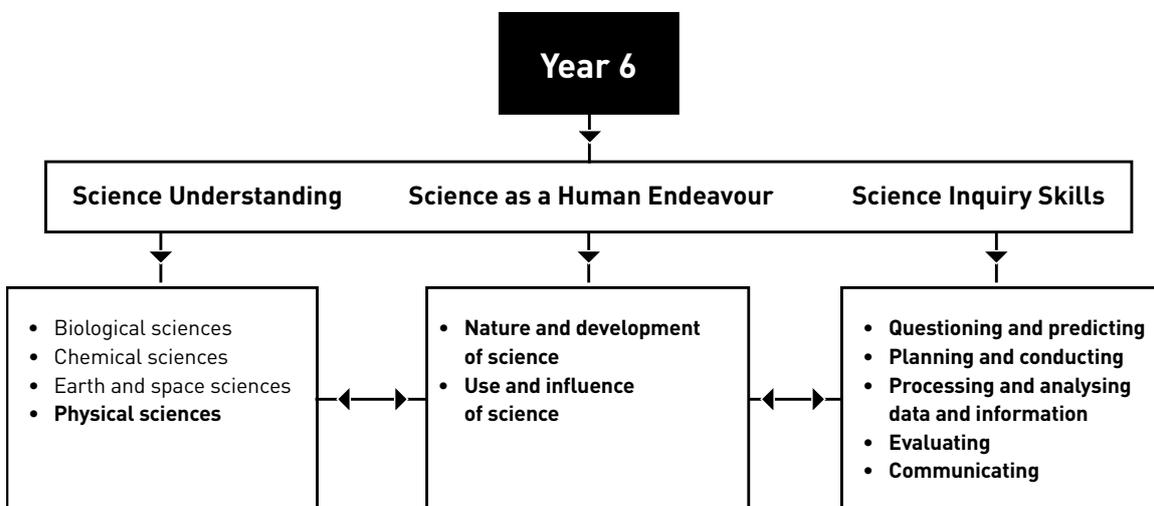
For ease of assessment the table below outlines the sub-strands and their aligned lessons.

Strand	Sub-strand	Code	Year 6 content descriptions	Lessons
Science Understanding	Physical sciences	ACSU219	Energy from a variety of sources can be used to generate electricity	1–8
		ACSU097	Electrical circuits provide a means of transferring and transforming electricity	1, 5, 6, 8
Science as a Human Endeavour	Nature and development of science	ACSHE098	Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena	1, 2, 3, 4, 7, 8
		ACSHE099	Important contributions to the advancement of science have been made by people from a range of cultures	4
	Use and influence of science	ACSHE100	Scientific understandings, discoveries and inventions are used to solve problems that directly affect people's lives	1–8
		ACSHE220	Scientific knowledge is used to inform personal and community decisions	4, 6, 7, 8
Science Inquiry Skills	Questioning and predicting	ACSIS232	With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be	1, 4, 7
	Planning and conducting	ACSIS103	With guidance, plan appropriate investigation methods to answer questions or solve problems	2, 3, 4, 7
		ACSIS104	Decide which variable should be changed and measured in fair tests and accurately observe, measure and record data, using digital technologies as appropriate	4, 7
		ACSIS105	Use equipment and materials safely, identifying potential risks	3, 4, 7
	Processing and analysing data and information	ACSIS107	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, 7
		ACSIS221	Compare data with predictions and use as evidence in developing explanations	2, 3, 4, 5, 7
	Evaluating	ACSIS108	Suggest improvements to the methods used to investigate a question or solve a problem	3, 4, 7, 8
	Communicating	ACSIS110	Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts	1–8

 All the material in the first four columns of this table is sourced from the Australian Curriculum.

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.



All the terms in this diagram are sourced from the Australian Curriculum.

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 *Essential energy*, these overarching ideas are represented by:

Overarching idea	Incorporation in <i>Essential energy</i>
Patterns, order and organisation	Students identify patterns of electricity usage in their everyday lives and classify energy types.
Form and function	Students examine the forms and functions of electrical appliances. They explore how modifications to the form of a waterwheel affect its ability to function.
Stability and change	Students explore how energy—in particular electrical energy—can be used to change the world around them.
Scale and measurement	Students conduct energy audits of appliances using correct units of measurement. They use formal measurement to compare rates of change or energy transfer when testing their waterwheels.
Matter and energy	Students identify, describe and classify different types of energy and are introduced to simple energy transfers and transformations, including the ways energy and matter interact.
Systems	Students explore simple systems of energy transfer and transformation in their homes and relate this to the larger system of energy production and distribution for a town.

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>Essential energy</i>
<p>Recognising questions that can be investigated scientifically and investigating them</p>	<p>Students discuss different forms of energy and pose questions for investigation on how electricity is used in the home and how it is generated. They use Science Inquiry Skills to conduct fair tests on how machines can transform energy more efficiently.</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 6 achievement standard.

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.

Essential energy—Australian Curriculum general capabilities

General capabilities	Australian Curriculum description	<i>Essential energy</i> 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>Essential energy</i> the literacy focuses are:</p> <ul style="list-style-type: none"> • science chat-boards • word walls • science journals • glossaries • tables • procedural texts • annotated diagrams • flow charts • factual texts.
 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"> • collect, interpret and represent data about forms of energy.
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 interactive resource technology to view, record and discuss information • use the internet to research further information about forms of energy.
 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"> • use reasoning to develop questions for inquiry • formulate, pose and respond to questions • develop evidence-based claims.
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"> • ask questions of others, respecting each other's point of view.
 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"> • work collaboratively in teams • participate in discussions.
 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.

 All the material in the first two columns of this table is sourced from the Australian Curriculum.

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.primaryconnections.org.au

Essential energy focuses on the Western science way of making evidence-based claims about energy, its sources (both renewable and non-renewable), and the way it is transferred between objects and transformed from one form to another. Indigenous cultures might have different explanations for understanding energy, its sources and behaviour.

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 *Essential energy*, students explore the concept of energy itself and the way it can be transferred from one place to another and transformed from one form to another. These concepts are at the centre of current energy debates, so prevalent in the world with its increasing population and the corresponding increase in demands for energy.

The unit provides students with opportunities to develop an understanding of some of the challenges facing humanity in the demand and supply of energy. 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, including energy sources.

Alignment with the Australian Curriculum: English and Mathematics

Strand	Sub-strand	Code	Year 6 content descriptions	Lessons
English— Language	Language variation and change	ACELA1515	Understand that different social and geographical dialects or accents are used in Australia in addition to Standard Australian English	1, 3, 4, 5, 6, 7, 8
	Language for interaction	ACELA1517	Understand the uses of objective and subjective language and bias	1, 3, 6
	Text structure and organisation	ACELA1518	Understand how authors often innovate on text structures and play with language features to achieve particular aesthetic, humorous and persuasive purposes and effects	1, 7, 8
	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	1, 3, 4, 5, 6, 7
		ACELA1525	Investigate how vocabulary choices, including evaluative language, can express shades of meaning, feeling and opinion	3, 4, 6, 7, 8
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	5, 8
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	1, 2, 3, 4, 6, 7, 8
		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	1–8
		ACELY1710	Plan, rehearse and deliver presentations, selecting and sequencing appropriate content and multi-modal elements for defined audiences and purposes, making appropriate choices for modality and emphasis	8
	Interpreting, analysing, evaluating	ACELY1713	Use comprehension strategies to interpret and analyse information and ideas, comparing content from a variety of textual sources including media and digital texts	1, 2, 3, 4, 5, 7, 8
		ACELY1801	Analyse strategies authors use to influence readers	8
	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	6, 7
	Mathematics	Number and Algebra	ACMNA123	Select and apply efficient mental and written strategies, and appropriate digital technologies to solve problems involving all four operations with whole numbers
Statistics and probability		ACMSP147	Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables	2
		ACMSP148	Interpret secondary data presented in digital media and elsewhere	5

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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.primaryconnections.org.au