

Mapping tool – preamble for Science

This mapping tool matches essential content elements from two curriculum frameworks: *Every chance to learn* ELA 19, ELA 2 and ELA 20 to the Australian Curriculum (Science) V1.1. Teachers using this tool are reminded to consider the underlying principles and philosophy as well.

The **Overview** of each ELA in *Every chance to learn* discusses the scope, features, concepts, values and attitudes of

- ELA 19 *The student understands and applies scientific knowledge*
- ELA 2 *The student understands and applies the inquiry process*
- ELA 20 *The student acts for an environmentally sustainable future*

The **Rationale** of the Australian Curriculum (Science) reminds readers that the interrelated strands have different intentions:

- The *Science Understanding* strand refers to *the facts, concepts, laws theories and models that have been established by scientists over time.*
- The *Science as a Human Endeavour* strand *highlights the development of science as a unique way of knowing and doing, and the role of science in contemporary decision making and problem solving.*
- The *Science Inquiry Skills* strand outlines the process of working scientifically.

As Sustainability is a cross-curriculum priority, the elaborations of all phase 1 learning areas provide examples of how sustainability may be embedded within content.

Given that the documents are differently organised, the similarity of some essential content in both documents may appear superficial. These types of matches have been identified using a paler font colour.

Further information can be inferred from

- **strand** and **sub-stand** headings
- opening **hyperlinked codes** to the Australian Curriculum, and pasting them into the 'search' function to identify content elaborations, general capabilities and links to cross-curriculum priorities.

Science – Early Adolescence

Every chance to learn		Australian Curriculum		
19. The student understands and applies scientific knowledge		AC Strand/s		
		SU = science understanding SHE = Science as a Human Endeavour SIS = Science Inquiry Skills		
		Year 6	Year 7	Year 8
19.EA.1	how science and its applications have changed the ways people live	<ul style="list-style-type: none"> • Use and Influence of science (ACSHE100) Scientific understandings, discoveries and inventions are used to solve problems that directly affect people's lives 	<ul style="list-style-type: none"> • Use and influence of science (ACSHE121) Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management 	<ul style="list-style-type: none"> • Use and influence of science (ACSHE136) Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management
19.EA.2	scientific work as rewarding for a variety of reasons and contemporary Australian work in science	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Use and influence of science (ACSHE224) People use understanding and skills from across the disciplines of science in their occupations 	<ul style="list-style-type: none"> • Use and influence of science (ACSHE227) People use understanding and skills from across the disciplines of science in their occupations

<p>19.EA.3</p>	<p>how scientific understandings have changed over time and that different cultures may have different views in relation to scientific practice (e.g. traditional cultural explanations of phenomena and practices in areas such as medicine)</p>	<ul style="list-style-type: none"> • Nature and development of science <p>(ACSHE099) Important contributions to the advancement of science have been made by people from a range of cultures</p>	<ul style="list-style-type: none"> • Nature and development of science <p>(ACSHE119) Scientific knowledge changes as new evidence becomes available, and some scientific discoveries have significantly changed people's understanding of the world</p> <ul style="list-style-type: none"> • Use and influence of science <p>(ACSHE120) Science and technology contribute to finding solutions to a range of contemporary issues; these solutions may impact on other areas of society and involve ethical considerations</p>	<ul style="list-style-type: none"> • Nature and development of science <p>(ACSHE134) Scientific knowledge changes as new evidence becomes available, and some scientific discoveries have significantly changed people's understanding of the world</p> <ul style="list-style-type: none"> • Use and influence of science <p>(ACSHE135) Science and technology contribute to finding solutions to a range of contemporary issues; these solutions may impact on other areas of society and involve ethical considerations</p>
<p>19.EA.4</p>	<p>forces acting in the same or different directions and so supporting or opposing each other (e.g. floating and sinking, simple machines, speeding up and slowing down)</p>	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Physical sciences <p>(ACSSU117) Change to an object's motion is caused by unbalanced forces acting on the object</p>	<ul style="list-style-type: none"> •

19.EA.5	ways in which different forms of energy can be transferred or stored (e.g. electrical circuits, batteries)	<ul style="list-style-type: none"> • Physical Sciences (ACSSU097) Electrical circuits provide a means of transferring and transforming electricity (ACSSU219) Energy from a variety of sources can be used to generate electricity 	•	<ul style="list-style-type: none"> • Physical sciences (ACSSU155) Energy appears in different forms including movement (kinetic energy), heat and potential energy, and causes change within systems
19.EA.6	a particle model to explain solids, liquids and gases	•	•	<ul style="list-style-type: none"> • Chemical sciences (ACSSU151) The properties of the different states of matter can be explained in terms of the motion and arrangement of particles
19.EA.7	relationships between properties, composition and use of different materials (e.g. strength, solubility, porosity, viscosity, absorbency and conductivity)	•	•	•
19.EA.8	features of physical and chemical changes and the reversibility of change (e.g. dissolving, crystallising, decomposing)	<ul style="list-style-type: none"> • Chemical Sciences (ACSSU095) Changes to materials can be reversible, such as melting, freezing or evaporating; or irreversible, such as burning or rusting. 	<ul style="list-style-type: none"> • Chemical sciences (ACSSU113) Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques 	<ul style="list-style-type: none"> • Chemical sciences (ACSSU225) Chemical change involves substances reacting to form new substances

19.EA.9	the cell as the basic unit of all living things	•	•	<ul style="list-style-type: none"> • Biological sciences <p>(ACSSU149) Cells are the basic units of living things and have specialised structures and functions</p>
19.EA.10	biological classification systems and their applications	•	<ul style="list-style-type: none"> • Biological sciences <p>(ACSSU111) There are differences within and between groups of organisms; classification helps organise this diversity</p>	
19.EA.11	why some living things are better suited to their environment than others	<ul style="list-style-type: none"> • Biological Sciences <p>(ACSSU094) The growth a survival of living things are affected by the physical conditions of their environment</p>	•	•
19.EA.12	food chains and webs as models of relationships within living communities	•	<ul style="list-style-type: none"> • Biological sciences <p>(ACSSU112) Interactions between organisms, , can be described in terms of food chains and food webs; human activity can affect these interactions</p>	

<p>19.EA.13</p>	<p>relationships between the Earth, moon and sun and the existence of gravitational attraction between all the objects in the solar system</p>	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Earth and space sciences <p>(ACSSU115) Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the sun, Earth and the moon</p> <ul style="list-style-type: none"> • Physical Sciences <p>(ACSSU118) Earth's gravity pulls objects towards the centre of the Earth</p>	<ul style="list-style-type: none"> •
<p>19.EA.14</p>	<p>Earth's changes occurring over different time scales and use of geological evidence to interpret past events</p>	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Earth and space sciences <p>(ACSSU153) Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within the Earth over a variety of timescales</p>
<p>19.EA.15</p>	<p>explore, identify and model relationships (e.g. solar system, food chains and webs) to explain interrelationships and predict change</p>	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Biological sciences <p>(ACSSU112) Interactions between organisms, can be described in terms of food chains and food webs; human activity can affect these interactions</p>	<ul style="list-style-type: none"> •

19.EA.16	apply scientific knowledge and language in interpreting information and forming explanations, arguments and lines of reasoning	•	•	•
19.EA.17	safely and correctly use laboratory equipment	<ul style="list-style-type: none"> • Planning and conducting (AC SIS105) Use equipment and materials safely, identifying potential risks 	•	•
19.EA.18	use their scientific understandings to consider and respond to appropriate ethical and social issues relevant to them (e.g. those related to health and well-being)	<ul style="list-style-type: none"> • Use and Influence of science (AC SHE220) Scientific knowledge is used to inform personal and community decisions 	•	•
NEW MATERIAL	<ul style="list-style-type: none"> • Earth and Space Sciences (AC SSU096) Sudden geological changes or extreme weather conditions can affect the Earth's surface 	<ul style="list-style-type: none"> • Earth and space sciences (AC SSU222) Water is an important resource that cycles through the environment 	<ul style="list-style-type: none"> • Biological sciences (AC SSU150) Multi-cellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce 	

		•	•	<ul style="list-style-type: none"> Chemical sciences (ACSSU152) Differences between elements, compounds and mixtures can be described at a particle level
			<ul style="list-style-type: none"> Nature and development of science (ACSHE223) Science knowledge can develop through collaboration and connecting ideas across the disciplines of science 	<ul style="list-style-type: none"> Nature and development of science (ACSHE226) Science knowledge can develop through collaboration and connecting ideas across the disciplines of science
Every chance to learn	Australian Curriculum			
2. The student understands and applies the inquiry process	AC Strand/s SU = science understanding SHE = Science as a Human Endeavour SIS = Science Inquiry Skills			
	Year 6	Year 7	Year 8	
2 EA.1	understand variations of the inquiry process used in particular disciplines (e.g. in historical research, scientific testing, mathematical analysis)	•	•	•

<p>2.EA.2</p>	<p>select and use appropriate forms of the inquiry process for particular purposes, including a range of investigative, modelling and problem-solving strategies</p>	<ul style="list-style-type: none"> • Planning and conducting (AC SIS103) With guidance, select appropriate investigation methods to answer questions or solve problems 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<p>2.EA.3</p>	<p>formulate questions, predictions or propositions suitable for investigation and clarify the inquiry focus</p>	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Questioning and predicting (AC SIS124) Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge 	<ul style="list-style-type: none"> • Questioning and predicting (AC SIS139) Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge
<p>2.EA.4</p>	<p>plan steps to conduct the inquiry, including equipment, safety, time and level of collaboration required</p>	<ul style="list-style-type: none"> • Planning and conducting 	<ul style="list-style-type: none"> • Planning and conducting (AC SIS125) Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed 	<ul style="list-style-type: none"> • Planning and conducting (AC SIS140) Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed

2 EA.5	determine data or information needs and devise suitable methods to collect the data or information required	<ul style="list-style-type: none"> • Planning and conducting (AC SIS103) With guidance, select appropriate investigation methods to answer questions or solve problems • Nature and development of science (ACSHE098) Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena 	•	•
2.EA.6	plan and conduct scientific investigations with an understanding of the requirements of fair testing (e.g. maintain the same conditions, identify the variable to be changed and the variable to be measured)	<ul style="list-style-type: none"> • Planning and conducting (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 	<ul style="list-style-type: none"> • Planning and conducting (AC SIS126) In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task 	<ul style="list-style-type: none"> • Planning and conducting (AC SIS141) In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task
2.EA.7	collect and assemble relevant data or information taking steps to minimise error (e.g. systematic observation, repeated trials)	<ul style="list-style-type: none"> • 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 	•	•

<p>2.EA.8</p>	<p>access and interpret a range of primary and/or secondary sources of information (e.g. historical documents, images, oral histories, biographies, articles, media sources, statistical data sets)</p>	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<p>2 EA.9</p>	<p>evaluate the accuracy, relevance, completeness and credibility of data and information and their sources (e.g. recognise evidence, opinion, bias and perspective; identify credentials of authors or websites)</p>	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<p>2.EA.10</p>	<p>develop mathematical models, test propositions, hypotheses and conjectures, and identify key assumptions and conditions that apply to working mathematically in different contexts</p>	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •

<p>2.EA.11</p>	<p>organise and analyse data or information (e.g. using ICT), summarise and explain patterns in data, or compare and synthesise information from different sources</p>	<ul style="list-style-type: none"> • Processing and analysing data and information <p>(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</p> <p>(AC SIS221) Compare data with predictions and use as evidence in developing explanations</p>	<ul style="list-style-type: none"> • Processing and analysing data and information <p>(AC SIS129) Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships , including using digital technologies as appropriate</p>	<ul style="list-style-type: none"> • Processing and analysing data and information <p>(AC SIS144) Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships , including using digital technologies as appropriate</p>
<p>2.EA.12</p>	<p>review their understanding in light of new information</p>	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<p>2 EA.13</p>	<p>draw reasonable conclusions based on analysis of data and information</p>	<ul style="list-style-type: none"> • Processing and analysing data and information <p>(AC SIS221) Compare data with predictions and use as evidence in developing explanations</p> <ul style="list-style-type: none"> • Nature and development of science <p>(AC SHE098) Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena</p>	<ul style="list-style-type: none"> • Evaluating <p>(AC SIS132) Use scientific knowledge and findings from investigations to evaluate claims</p>	<ul style="list-style-type: none"> • Evaluating <p>(AC SIS234) Use scientific knowledge and findings from investigations to evaluate claims</p>

2.EA.14	systematically check reasoning and follow simple deductions to explore the possible truth of mathematical statements and justify generalisations	•	•	•
2.EA.15	present the inquiry focus, problems, background, ideas and approaches and report on results, findings and conclusions using suitable representations and discipline-based terminology	<ul style="list-style-type: none"> • Communicating (AC SIS110) Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts 	<ul style="list-style-type: none"> • Communicating (AC SIS133) Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate 	<ul style="list-style-type: none"> • Communicating (AC SIS148) Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate
2.EA.16	discuss and compare their results with those of others for the same investigation, suggest reasons for any differences, and make suggestions to improve their investigations or conduct further investigations	<ul style="list-style-type: none"> • Processing and analysing data and information (AC SIS221) Compare data with predictions and use as evidence in developing explanations 	<ul style="list-style-type: none"> • Processing and analysing data and information (AC SIS130) Summarise data, from students' own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions 	<ul style="list-style-type: none"> • Processing and analysing data and information (AC SIS145) Summarise data, from students' own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions

2.EA.17	reflect on the appropriateness of methods of presenting data in terms of clarity and/or ease of analysis	<ul style="list-style-type: none"> Evaluating (AC SIS108) Suggest improvements to the methods used to investigate a question and solve a problem. 	<ul style="list-style-type: none"> Evaluating (AC SIS131) Reflect on the method used to investigate a question or solve a problem, including evaluating the quality of the data collected, and identify improvements to the method 	<ul style="list-style-type: none"> Evaluating (AC SIS146) Reflect on the method used to investigate a question or solve a problem, including evaluating the quality of the data collected, and identify improvements to the method
2.EA.18	acknowledge sources of information using bibliographies.	•	•	•

Every chance to learn		Australian Curriculum		
20. The student acts for an environmentally sustainable future		AC Strand/s SU = science understanding SHE = Science as a Human Endeavour SIS = Science Inquiry Skills		
		Year 6	Year 7	Year 8
20.EA.1	concepts of interdependence of living things, habitat and ecosystem	•	<ul style="list-style-type: none"> Biological sciences (ACSSU112) Interactions between organisms, , can be described in terms of food chains and food webs; human activity can affect these interactions (Repeats 19.EA.12) 	•

20.EA.2	some of the processes by which human activities change natural environments in positive and negative ways (e.g. reducing feral animal populations, tourism, deforestation)	<ul style="list-style-type: none"> • Biological sciences (ACSSU094) The growth and survival of living things are affected by the physical conditions of their environment 	•	•
20.EA.3	population growth impacts on environmental systems (e.g. urbanisation, locust, cane toad or weed infestation)	•	•	•
20.EA.4	responsibilities of global citizenship for individuals, organisations and governments and the roles and responsibilities of companies, producers and consumers in relation to sustainability	•	•	•
20.EA.5	how countries work together to protect the environment	•	•	•

20.EA.6	conduct case study investigations into local and/or national ecosystems to identify changes and predict their impacts	•	•	•
20.EA.7	compare the use of renewable and non-renewable energy sources and investigate which of Earth's resources they use are reusable, renewable or neither	•	<ul style="list-style-type: none"> • Earth and space sciences (ACSSU116) Some of Earth's resources are renewable, but others are non-renewable 	•
20.EA.8	investigate practical ways for individuals, households or communities to conserve resources (e.g. waste recycling, energy and water saving) and evaluate their practicality and effectiveness	•	•	•
20.EA.9	participate in raising awareness about environmental issues	•	•	•

20.EA.10	examine issues of sustainability of the natural, built or social environment, extending from local to global perspectives (e.g. investigate arguments and studies about climate change and its effects; generate probable, possible and preferred scenarios for future sustainable living)	•	•	•
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