Prep to Year 7 unit overview for multiple year levels
Australian Curriculum: Science

Source: Australian Curriculum, Assessment and Reporting Authority (ACARA), *Australian Curriculum v3.0: Science for Foundation–10*, <www.australiancurriculum.edu.au/Science/Curriculum/F-10>.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| School name | Conceptual thread | Unit title | Year levels | Duration of unit |
| Our School | Energy | The sustainable home | Prep to Year 7 | One term |

| Unit outline |
| --- |
| Through the context of the sustainable home, children/students will:* investigate where science is used in their everyday lives and how energy sources such as light, sound and heat are sensed
* explore the role of energy through the phenomena of light, sound, heat and electricity in everyday objects and devices
* explore how science knowledge helps people to develop sustainable practices
* examine how scientific understandings, discoveries and inventions are used to solve energy issues throughout society.

Questions that shape the inquiry could include: * How do we see energy at work?
* What do scientists mean by the word “energy”?
* What are some different types of energy? What is heat energy? What is light energy? What is sound energy? What is electrical energy?
* What are the sources of different types of energy?
* How are the sources of energy detected?
* Where can you see energy being changed from one form to another?
* Where is energy used at home?
* What are the design features of an energy-efficient home?
* Why is energy efficiency important to society?
 |

Outlining the conceptual threads

|  |
| --- |
| Energy conceptual threadThe conceptual thread is taught through a “Year A” or “Year B” rotation of contextual units. The units are planned this way to encourage interest in subject matter as well as allow for concepts to be built upon that have been covered the previous year. |
| Prep to Year 2 | Years 3 to 5 | Years 6 to 7 |
| * Light and sound are produced by a range of sources and can be sensed
 | * Heat can be produced in many ways and can move from one object to another
* Light from a source forms shadows and can be absorbed, reflected and refracted
 | * Electrical circuits provide a means of transferring and transforming electricity
* Energy from a variety of sources can be used to generate electricity
 |
|  |
| Elements of the conceptual thread across Prep to Year 5 |  | Elements of the conceptual thread across Years 3 to 7 |
| * Light and sound are produced by a range of sources and can be sensed
* Heat can be produced in many ways and can move from one object to another
* Light from a source forms shadows and can be absorbed, reflected and refracted
 | * Heat can be produced in many ways and can move from one object to another
* Light from a source forms shadows and can be absorbed, reflected and refracted
* Electrical circuits provide a means of transferring and transforming electricity
* Energy from a variety of sources can be used to generate electricity
 |
|  |
|  | Elements of the conceptual thread across Prep to Year 7 |  |
| * Light and sound are produced by a range of sources and can be sensed
* Heat can be produced in many ways and can move from one object to another
* Light from a source forms shadows and can be absorbed, reflected and refracted
* Electrical circuits provide a means of transferring and transforming electricity
* Energy from a variety of sources can be used to generate electricity
 |

Context for the unit

The sustainable home

| Identify curriculum |
| --- |
| Content descriptions to be taught |
| Prep to Year 2 |
| Science Understanding | Science as a Human Endeavour | Science Inquiry Skills |
| * Light and sound are produced by a range of sources and can be sensed [(ACSSU020)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU020)
 | Prep* Science involves exploring and observing the world using the [senses](http://www.australiancurriculum.edu.au/Glossary?a=S&t=senses) [(ACSHE013)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE013)

Year 1 to Year 2* Science involves asking questions about, and describing changes in, objects and events [(ACSHE021)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE021) [(ACSHE034)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE034)
* People use science in their daily lives, including when caring for their environment and living things [(ACSHE022)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE022) [(ACSHE035)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE035)
 | Prep* Respond to questions about familiar objects and events [(ACSIS014)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS014)
* Explore and make observations by using the [senses](http://www.australiancurriculum.edu.au/Glossary?a=S&t=senses) [(ACSIS011)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS011)
* Engage in discussions about observations and use methods such as drawing to represent ideas [(ACSIS233)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS233)
* Share observations and ideas [(ACSIS012)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS012)

Year 1 to Year 2* Respond to and pose questions, and make predictions about familiar objects and events [(ACSIS024)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS024) [(ACSIS037)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS037)
* Participate in different types of guided investigations to explore and answer questions, such as manipulating materials, testing ideas, and accessing information sources [(ACSIS025)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS025) [(ACSIS038)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS038)
* Use informal measurements in the collection and recording of observations, with the assistance of digital technologies as appropriate [(ACSIS026)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS026) [(ACSIS039)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS039)
* Use a range of methods to sort information, including drawings and provided tables [(ACSIS027)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS027) [(ACSIS040)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS040)
* Through discussion, compare observations with predictions [(ACSIS212)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS212)  [(ACSIS214)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS214)
* Compare observations with those of others [(ACSIS213)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS213) [(ACSIS041)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS041)
* Represent and communicate observations and ideas in a variety of ways such as oral and written language, drawing and role play [(ACSIS029)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS029) [(ACSIS042)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS042)
 |

| Identify curriculum |
| --- |
| Content descriptions to be taught |
| Years 3 to 5 |
| Science Understanding | Science as a Human Endeavour | Science Inquiry Skills |
| * Heat can be produced in many ways and can move from one object to another [(ACSSU049)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU049)
* Light from a source forms shadows and can be absorbed, reflected and refracted [(ACSSU080)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU080)
 | Year 3 to Year 4* Science involves making predictions and describing patterns and relationships [(ACSHE050)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE050) [(ACSHE061)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE061)

Year 5* Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena [(ACSHE081)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE081)
* Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples’ lives [(ACSHE083)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE083)
* Scientific knowledge is used to inform personal and community decisions [(ACSHE217)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE217)
 | Year 3 to Year 4* With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge [(ACSIS053)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS053) [(ACSIS064)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS064)
* Suggest ways to plan and conduct investigations to find answers to questions [(ACSIS054)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS054) [(ACSIS065)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS065)
* Safely use appropriate materials, tools or equipment to make and record observations, using formal measurements and digital technologies as appropriate [(ACSIS055)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS055) [(ACSIS066)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS066)
* Use a range of methods including [tables](http://www.australiancurriculum.edu.au/Glossary?a=S&t=tables) and simple column [graphs](http://www.australiancurriculum.edu.au/Glossary?a=S&t=graphs) to represent [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data) and to identify [patterns](http://www.australiancurriculum.edu.au/Glossary?a=S&t=patterns) and [trends](http://www.australiancurriculum.edu.au/Glossary?a=S&t=trends) [(ACSIS057)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS057) [(ACSIS068)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS068)
* Compare results with predictions, suggesting possible reasons for findings [(ACSIS215)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS215) [(ACSIS216)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS216)
* Reflect on the investigation, including whether a test was fair or not [(ACSIS058)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS058) [(ACSIS069)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS069)
* Represent and communicate ideas and findings in a variety of ways such as diagrams, physical representations and simple reports  [(ACSIS060)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS060) [(ACSIS071)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS071)

Year 5* With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be [(ACSIS231)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS231)
* With guidance, plan appropriate investigation methods to answer questions or solve problems [(ACSIS086)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS086)
* Decide which variable should be changed and measured in fair tests and accurately observe, measure and record data, using digital technologies as appropriate [(ACSIS087)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS087)
* Use equipment and materials safely, identifying potential risks [(ACSIS088)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS088)
* 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 [(ACSIS090)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS090)
* Compare data with predictions and use as evidence in developing explanations [(ACSIS218)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS218)
* Suggest improvements to the methods used to investigate a question or solve a problem [(ACSIS091)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS091)
* Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts [(ACSIS093)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS093)
 |

| Identify curriculum |
| --- |
| Content descriptions to be taught |
| Years 6 to 7 |
| Science Understanding | Science as a Human Endeavour | Science Inquiry Skills |
| * Electrical circuits provide a means of transferring and transforming electricity [(ACSSU097)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU097)
* Energy from a variety of sources can be used to generate electricity [(ACSSU219)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU219)
 | Year 6* Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena [(ACSHE098)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE098)
* Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples’ lives [(ACSHE100)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE100)
* Scientific knowledge is used to inform personal and community decisions [(ACSHE220)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE220)

Year 7* Scientific knowledge changes as new evidence becomes available, and some scientific discoveries have significantly changed people’s understanding of the world [(ACSHE119)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE119)
* 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 [(ACSHE120)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSHE120)
 | Year 6* With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be [(ACSIS232)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS232)
* With guidance, plan appropriate investigation methods to answer questions or solve problems [(ACSIS103)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS103)
* Decide which variable should be changed and measured in fair tests and accurately observe, measure and record data, using digital technologies as appropriate [(ACSIS104)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS104)
* Use equipment and materials safely, identifying potential risks [(ACSIS105)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS105)
* 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 [(ACSIS107)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS107)
* Compare data with predictions and use as evidence in developing explanations [(ACSIS221)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS221)
* Suggest improvements to the methods used to investigate a question or solve a problem [(ACSIS108)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS108)
* Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts [(ACSIS110)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS110)

Year 7* Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge [(ACSIS124)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS124)
* Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed [(ACSIS125)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS125)
* In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task [(ACSIS126)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS126)
* 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 [(ACSIS129)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS129)
* Summarise [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data), from students’ own [investigations](http://www.australiancurriculum.edu.au/Glossary?a=S&t=investigations) and [secondary sources](http://www.australiancurriculum.edu.au/Glossary?a=S&t=secondary+sources), and use scientific understanding to identify [relationships](http://www.australiancurriculum.edu.au/Glossary?a=S&t=relationships) and draw [conclusions](http://www.australiancurriculum.edu.au/Glossary?a=S&t=conclusions) [(ACSIS130)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS130)
* 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 [(ACSIS131)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS131)
* Use scientific knowledge and findings from [investigations](http://www.australiancurriculum.edu.au/Glossary?a=S&t=investigations) to [evaluate](http://www.australiancurriculum.edu.au/Glossary?a=S&t=evaluate) claims [(ACSIS132)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS132)
* Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate [(ACSIS133)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSIS133)
 |

| Identify curriculum |
| --- |
| General capabilities and cross-curriculum priorities |
| Description: Description: Description: gc_literacy Literacy* Explore and develop literacy skills embedded in teaching and learning within science
* Develop and use topic vocabulary
* Add labels and captions to diagrams and communicate ideas using labelled diagrams
* Use accurate scientific language

**Description: Description: gc_numeracy Numeracy*** Make measurements and interpret data
* Analyse data to identify patterns
* Present graphs to represent data

Description: Description: gc_ict **ICT capability*** Use a range of digital resources and simulations
* Use data loggers to gather experimental data
* Research using the internet

**Description: Description: gc_critical Critical and creative thinking*** Apply critical thinking when reasoning and evaluating energy sources
* Use thinking skills to complete group activities and plan investigations
* Analyse, evaluate and summarise information

Description: Description: gc_personal_social **Personal and social capability*** Develop communication skills for communicating ideas
* Practise self-management skills when participating in science investigations and learning experiences

**Description: Description: cc_sust_acara Sustainability*** Develop an appreciation of the need for more sustainable patterns of living
 |

|  |
| --- |
| Identify curriculum |
| Achievement standard  |
| Prep | By the end of the Foundation year, students describe the [properties](http://www.australiancurriculum.edu.au/Glossary?a=S&t=properties) and behaviour of familiar objects. They suggest how the [environment](http://www.australiancurriculum.edu.au/Glossary?a=S&t=environment) affects them and other living things. Students share observations of familiar objects and events. |
| Year 1 | By the end of Year 1, students describe objects and events that they encounter in their everyday lives, and the effects of interacting with [materials](http://www.australiancurriculum.edu.au/Glossary?a=S&t=materials) and objects. They identify a range of habitats. They describe changes to things in their [local environment](http://www.australiancurriculum.edu.au/Glossary?a=S&t=local+environment) and suggest how science helps people care for environments. Students make predictions, and investigate everyday phenomena. They follow instructions to record and sort their observations and share their observations with others. |
| Year 2 | By the end of Year 2, students describe changes to objects, [materials](http://www.australiancurriculum.edu.au/Glossary?a=S&t=materials) and living things. They identify that certain [materials](http://www.australiancurriculum.edu.au/Glossary?a=S&t=materials) and resources have different uses and describe examples of where science is used in people’s daily lives. Students pose questions about their experiences and predict outcomes of [investigations](http://www.australiancurriculum.edu.au/Glossary?a=S&t=investigations). They use informal measurements to make and compare observations. They follow instructions to record and represent their observations and communicate their ideas to others. |
| Year 3 | By the end of Year 3, students use their understanding of the movement of the Earth, [materials](http://www.australiancurriculum.edu.au/Glossary?a=S&t=materials) and the behaviour of heat to suggest explanations for everyday observations They describe features common to living things. They describe how they can use science [investigations](http://www.australiancurriculum.edu.au/Glossary?a=S&t=investigations) to respond to questions and identify where people use science knowledge in their lives.Students use their experiences to pose questions and predict the outcomes of [investigations](http://www.australiancurriculum.edu.au/Glossary?a=S&t=investigations). They make formal measurements and follow procedures to collect and present observations in a way that helps to answer the [investigation](http://www.australiancurriculum.edu.au/Glossary?a=S&t=investigation) questions. Students suggest possible reasons for their findings. They describe how safety and fairness were considered in their [investigations](http://www.australiancurriculum.edu.au/Glossary?a=S&t=investigations). They use diagrams and other representations to communicate their ideas. |
| Year 4 | By the end of Year 4, students apply the [observable](http://www.australiancurriculum.edu.au/Glossary?a=S&t=observable) [properties](http://www.australiancurriculum.edu.au/Glossary?a=S&t=properties) of [materials](http://www.australiancurriculum.edu.au/Glossary?a=S&t=materials) to explain how objects and [materials](http://www.australiancurriculum.edu.au/Glossary?a=S&t=materials) can be used. They use contact and non-contact [forces](http://www.australiancurriculum.edu.au/Glossary?a=S&t=forces) to describe interactions between objects. They discuss how natural and human processes cause changes to the Earth’s surface. They describe [relationships](http://www.australiancurriculum.edu.au/Glossary?a=S&t=relationships) that assist the survival of living things and sequence key stages in the life cycle of a plant or animal. They identify when science is used to ask questions and make predictions. They describe situations where science understanding can influence their own and others’ actions.Students follow instructions to identify investigable questions about familiar contexts and predict likely outcomes from [investigations](http://www.australiancurriculum.edu.au/Glossary?a=S&t=investigations). They discuss ways to conduct [investigations](http://www.australiancurriculum.edu.au/Glossary?a=S&t=investigations) and safely use equipment to make and record observations. They use provided [tables](http://www.australiancurriculum.edu.au/Glossary?a=S&t=tables) and simple column [graphs](http://www.australiancurriculum.edu.au/Glossary?a=S&t=graphs) to organise their [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data) and identify [patterns](http://www.australiancurriculum.edu.au/Glossary?a=S&t=patterns) in [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data). Students suggest explanations for observations and compare their findings with their predictions. They suggest reasons why their methods were fair or not. They complete simple [reports](http://www.australiancurriculum.edu.au/Glossary?a=S&t=reports) to communicate their methods and findings. |

|  |
| --- |
| Identify curriculum |
| Achievement standard  |
| Year 5 | By the end of Year 5, students [classify](http://www.australiancurriculum.edu.au/Glossary?a=S&t=classify) substances according to their [observable](http://www.australiancurriculum.edu.au/Glossary?a=S&t=observable) [properties](http://www.australiancurriculum.edu.au/Glossary?a=S&t=properties) and behaviours. They explain everyday phenomena associated with the transfer of light. They describe the key features of our solar [system](http://www.australiancurriculum.edu.au/Glossary?a=S&t=system). They [analyse](http://www.australiancurriculum.edu.au/Glossary?a=S&t=analyse) how the form of living things enables them to function in their environments. Students discuss how scientific developments have affected people’s lives and how science knowledge develops from many people’s contributions. Students follow instructions to pose questions for [investigation](http://www.australiancurriculum.edu.au/Glossary?a=S&t=investigation), predict what might happen when [variables](http://www.australiancurriculum.edu.au/Glossary?a=S&t=variables) are changed, and plan [investigation](http://www.australiancurriculum.edu.au/Glossary?a=S&t=investigation) methods. They use equipment in ways that are safe and improve the accuracy of their observations. Students construct [tables](http://www.australiancurriculum.edu.au/Glossary?a=S&t=tables) and [graphs](http://www.australiancurriculum.edu.au/Glossary?a=S&t=graphs) to organise [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data) and identify [patterns](http://www.australiancurriculum.edu.au/Glossary?a=S&t=patterns). They use [patterns](http://www.australiancurriculum.edu.au/Glossary?a=S&t=patterns) in their [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data) to suggest explanations and refer to [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data) when they [report](http://www.australiancurriculum.edu.au/Glossary?a=S&t=report) findings. They describe ways to improve the fairness of their methods and communicate their ideas, methods and findings using a range of text types. |
| Year 6 | By the end of Year 6, students compare and [classify](http://www.australiancurriculum.edu.au/Glossary?a=S&t=classify) different types of [observable](http://www.australiancurriculum.edu.au/Glossary?a=S&t=observable) changes to [materials](http://www.australiancurriculum.edu.au/Glossary?a=S&t=materials). They [analyse](http://www.australiancurriculum.edu.au/Glossary?a=S&t=analyse) requirements for the transfer of electricity and describe how energy can be transformed from one form to another to generate electricity. They explain how natural events cause rapid change to the Earth’s surface. They describe and predict the effect of environmental changes on individual living things. Students explain how scientific knowledge is used in decision making and identify contributions to the development of science by people from a range of cultures.Students follow procedures to develop investigable questions and [design](http://www.australiancurriculum.edu.au/Glossary?a=S&t=design) [investigations](http://www.australiancurriculum.edu.au/Glossary?a=S&t=investigations) into simple cause-and-effect [relationships](http://www.australiancurriculum.edu.au/Glossary?a=S&t=relationships). They identify [variables](http://www.australiancurriculum.edu.au/Glossary?a=S&t=variables) to be changed and measured and describe potential safety risks when planning methods. They collect, organise and interpret their [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data), identifying where improvements to their methods or [research](http://www.australiancurriculum.edu.au/Glossary?a=S&t=research) could improve the [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data). They describe and [analyse](http://www.australiancurriculum.edu.au/Glossary?a=S&t=analyse) [relationships](http://www.australiancurriculum.edu.au/Glossary?a=S&t=relationships) in [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data) using graphic representations and construct [multi-modal texts](http://www.australiancurriculum.edu.au/Glossary?a=S&t=multi-modal+texts) to communicate ideas, methods and findings. |
| Year 7 | By the end of Year 7, students describe techniques to separate pure substances from mixtures. They represent and predict the effects of unbalanced [forces](http://www.australiancurriculum.edu.au/Glossary?a=S&t=forces), including Earth’s gravity, on motion. They explain how the relative positions of the Earth, sun and moon affect phenomena on Earth. They [analyse](http://www.australiancurriculum.edu.au/Glossary?a=S&t=analyse) how the [sustainable](http://www.australiancurriculum.edu.au/Glossary?a=S&t=sustainable) use of resources depends on the way they are formed and cycle through Earth [systems](http://www.australiancurriculum.edu.au/Glossary?a=S&t=systems). They predict the effect of environmental changes on feeding [relationships](http://www.australiancurriculum.edu.au/Glossary?a=S&t=relationships) and [classify](http://www.australiancurriculum.edu.au/Glossary?a=S&t=classify) and organise diverse organisms based on [observable](http://www.australiancurriculum.edu.au/Glossary?a=S&t=observable) differences. Students describe situations where scientific knowledge from different science disciplines has been used to solve a real-world problem. They explain how the solution was viewed by, and impacted on, different groups in society.Students identify questions that can be investigated scientifically. They plan fair experimental methods, identifying [variables](http://www.australiancurriculum.edu.au/Glossary?a=S&t=variables) to be changed and measured. They select equipment that improves fairness and accuracy and describe how they considered safety. Students draw on [evidence](http://www.australiancurriculum.edu.au/Glossary?a=S&t=evidence) to support their [conclusions](http://www.australiancurriculum.edu.au/Glossary?a=S&t=conclusions). They summarise [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data) from different sources, describe [trends](http://www.australiancurriculum.edu.au/Glossary?a=S&t=trends) and refer to the quality of their [data](http://www.australiancurriculum.edu.au/Glossary?a=S&t=data) when suggesting improvements to their methods. They communicate their ideas, methods and findings using [scientific language](http://www.australiancurriculum.edu.au/Glossary?a=S&t=scientific+language) and appropriate representations. |

|  |
| --- |
| Links to other learning areas |
| In the Foundation to Year 7 Australian Curriculum: English* Listen to and respond orally to texts and to the communication of others
* Engage in conversations and discussions, using active listening behaviours, showing interest and contributing ideas, information and questions
* Construct texts featuring print, visual and audio elements using software, including word processing programs
* Understand the use of vocabulary to express greater precision of meaning

In the Foundation to Year 7 Australian Curriculum: Mathematics * Answer yes/no questions to collect information
* Plan methods of data collection and representation
* Create displays of data using lists, tables, column graphs and picture graphs
* Interpret the results of data collection and graphs
* Interpret secondary data presented in digital media and elsewhere
 |

| Assessment |
| --- |
| Assessment overview |
| Children/students are given opportunities to demonstrate their knowledge, skills and understanding through both formative and summative assessment. The assessment is collated in individual assessment folios and allows for ongoing feedback to children/students on their learning.Teachers make decisions about the length of time required to complete the tasks and the conditions under which the assessment is to be conducted.The teaching and learning experiences throughout the term provide opportunities for children/students to develop the understanding and skills required to complete these assessments. As children/students engage with these learning experiences, the teacher can provide feedback on specific skills. |

| Assessment |
| --- |
| Describe the assessment | Assessment date | Make judgments |
| **Prep to Year 7****Collection of work (Written)** Children/students communicate their observations, ideas and/or research during or following each lesson. The teacher provides ongoing feedback. Entries (appropriate to each phase) include:* observation records from guided investigations
* reflection about learning
* one-to-one conferencing
* verbal reporting to the group on their own and others’ thinking
* class or group discussion about ideas
* concept maps
* flowcharts
* labelled diagrams
* research
* graphs and tables
* written explanations.
 | Throughout the term | Teachers gather evidence to make judgments about the following characteristics of student work:**Prep****Understanding*** description and identification of everyday objects using scientific knowledge
* use of scientific knowledge to explain a situation

**Skills*** response to questions about familiar objects
* make observations
* communication and representation of observations and ideas

**Year 1 and Year 2****Understanding*** description and identification of interactions with everyday objects using scientific knowledge
* use of scientific knowledge to explain a situation
 |
| Prep to Year 2**Experimental investigation: Model design and explanation (Multimodal)**Under the guidance of the teacher, children gather observations and data throughout the term that can be used to inform the assessment. Children:* identify and represent the observable features of objects around the school and home that are sources of light, sound and (heat) energy
* compare the different features of light and sound, e.g. pitch, loudness and colour
* relate the features of light and sound to their senses
* propose and test ways in which light and sound can be changed, e.g. changing pitch, loudness and colour
* conference with the teacher, who prompts further elaborations to demonstrate their understandings. They participate in a reflection circle to compare their plans to the final product
* demonstrate their obstacle course to the class and explain how it works.

Year 3 to Year 5**Experimental investigation: Model design and explanation (Multimodal)**Under the guidance of the teacher, students gather observations and data from investigations throughout the term that can be used to inform the design of a sustainable home.Students select a national location where an energy-efficient home is to be built. During the term they collect data from investigations to give them the knowledge to design the home to be energy efficient by taking into account the:* source of electricity for the home
* aspect of the home and the use of gardens, insulation, window tinting and window coverings to manage heat.

Students present a labelled and annotated set of house plans that justify the decisions made about the sources of electricity and the methods used to manage heat in the home. Written explanations about the method chosen to manage heat are based on the science of the movement of heat and analysis of data from investigations conducted during the term. | At the end of the term | * identification of the use of science in daily life

**Skills*** give plausible predictions
* make observations
* sorting and comparison of observations
* representation and communication of ideas and observations

**Year 3 and Year 4****Understanding*** description and identification of scientific information and concepts
* use of science knowledge to generate solutions and explanations
* identification of the use of science

**Skills*** identification of questions for investigation, making plausible predictions
* description of safety and fairness in investigations
* safe use of materials, tools and equipment, following procedures to make observations
* identification of patterns and trends in data and observations, making comparisons with predictions
* communication and representation of ideas, methods, observations and findings
 |
| Year 6 to Year 7**Experimental investigation: Model design and explanation (Multimodal)**Under the guidance of the teacher, students gather observations and data from investigations throughout the term that can be used to inform the design of an energy-efficient home.Students select a national or international location where an energy-efficient home is to be built. During the term they collect data from investigations to give them the knowledge to design the home to be energy efficient by taking into account the:* the source of electricity for the home
* the aspect of the home, the use of gardens, insulation, window tinting and window coverings to manage heat.

Students present a labelled and annotated set of house plans that justify the decisions made about the sources of electricity and the methods used to manage heat in the home. Written explanations about the method chosen to manage heat are based on the science of the movement of heat and analysis of data from investigations conducted during the term.Students construct a simple two room house model that is wired in parallel with two working light bulbs. They plan a simple test to investigate the generation of electricity for the bulbs using batteries and a combination of batteries (night) and solar panels (day). They present their conclusions in a scientific report. |  | **Year 5 and Year 6****Understanding*** description and identification of scientific information and concepts
* use of science knowledge to generate solutions and explanations
* description of the use of science knowledge to make decisions

**Skills*** development of questions for investigation, making plausible predictions about findings
* identification of variables, description of potential safety risks, and safe measurement and recording of data
* description of patterns and relationships in data, suggesting explanations and making comparisons with predictions
* identification and description of ways to improve the fairness of methods
* communication of ideas, methods and findings

**Year 7****Understanding*** description and identification of scientific facts, ideas, concepts, and phenomena
* use of science knowledge to generate solutions and explanations
* description of the application of science knowledge to solve a real-world problem
 |
|  |  |

|  |  |  |
| --- | --- | --- |
|  |  | **Skills*** identification of problems that can be investigated scientifically, making plausible predictions
* planning of investigations that take into account the need for fair testing and safety
* construction of models to identify and describe patterns and relationships and draw conclusions
* summary of data and information to identify and describe patterns and trends, and to draw conclusions
* description of how modifications to the method improved the quality of data
* communication using appropriate scientific language and representations

For further advice and guidelines on constructing guides to making judgments refer to the Learning area standard descriptors: [www.qsa.qld.edu.au](http://www.qsa.qld.edu.au) |

| Teaching and learning |
| --- |
| Adjustments for needs of learners |
| Section 6 of the *Disability Standards for Education* (The Standards for Curriculum Development, Accreditation and Delivery) states that education providers, including class teachers, must take reasonable steps to ensure a course/program is designed to allow any child/student to participate and experience success in learning. The *Disability Standards for Education 2005* (Cwlth) is available from: <www.ag.gov.au> select Human rights and anti-discrimination > Disability standards for education. |
| Resources |
| Web* websites for factsheets and interactive worksheets
* websites for videos and simulations to help children/students visualise conduction and convection and how solar cells work

Print* word wall
* worksheets
* diagrams of house designs and rooms

Equipment* stimulus for the “Explore” phase: pictures and models of lightning bolts, light bulbs, solar panels, solar ovens, gas heaters, musical instruments, shadows, prisms
* paper, crayons, pencils
* appliances from home that demonstrate light, sound, heat and electrical energy
* digital thermometers or data loggers
* solar cells
* components for building electric circuits: batteries, wires, light bulbs, switches

Safety equipment* completed risk assessment
* safety glasses, where applicable
 |

|  |
| --- |
| Teaching strategies and learning experiences Group work allows flexibility for children/students to revise or extend learning according to individual needs, which caters for the needs of all learners. |
| This unit overview has been developed using the 5E inquiry model for teaching and learning science. The 5E model follows a sequence of:Engage — begin with a lesson that captures children’s/students’ interest through an activity or question.Explore — organise hands-on activities where children/students explore a concept or skill.Explain — guide children/students to develop explanations for the experience after they have explored a concept or skill.Elaborate — encourage children/students to apply what they have learnt to a new situation.Evaluate — provide an opportunity for children/students to review and reflect on their learning. |
| Prep to Year 2  | Years 3 to 5  | Years 6 to 7  |
| Engage* Capture children’s/students’ interest through pictures and models of lightning bolts, light bulbs, solar panels, solar ovens, gas heaters, musical instruments, shadows and prisms.
* Through a teacher-led discussion, look for similarities, group similar things, and discuss why they have grouped the things in this way.
* Brainstorm: What is energy? What is heat energy? What is light energy? What is sound energy? What is electrical energy? Where is energy used at home?
* Use a KWLH chart to establish children’s/students’ current knowledge by asking them to consider: What do I know? What do I want to know? Children/students add this to their science journal.
* Discuss and distribute a home energy audit where children/students gather pictures to represent or record the light, sound, heat and electrical energy sources in their home.
* Establish small mixed age groups with older children/students acting as scribes/facilitators. Children/students discuss the different sources of energy they identified in the home audit. They report back to the whole class. Any conflicting ideas are discussed and explained, e.g. Can an oven be powered by both gas and fossil fuel energy?
* Create a word wall and question board to add to throughout the unit.
 |
| Explore* Source interactive websites that show sources of light, sound (and heat) energy.
* Conduct simple investigations to explore what senses are used to detect light, sound (and heat).
* Use pictures of home interiors to identify appliances that produce light, sound (and heat).
* Answer the question: How do we know light, sound (and heat) was produced by the appliance?
* Use pictures of homes typical to the local area with and without solar panels to discuss the source of energy for appliances in the home.
 | Explore* Explore activities from Prep to Year 2 first, if applicable.
* Answer the question: Can heat move? Compare different materials for heat transference and absorption properties. (The sun can be used as a heat source.)
* Explore the relationship between colour and heat absorbance.
* Make predictions and then investigate absorption, transmissions and reflection by shining light on a variety of objects.
* Use a selection of pictures of house designs, in different locations, as stimulus to discuss how design can influence the management of heat in a house and the source of electricity.
* Invite a local builder or architect to visit the class to talk about energy efficiency in the home in terms of the position of the house on the block, shade from gardens, types of insulation, position of windows, window coverings, sound proofing and the use of solar energy as a source of electricity.
* Conduct investigations to collect data to be used in the assessment. Investigate the management of heat through insulation, window position and coverings, shade and aspect.
* Conduct investigations into the management of sound energy through sound proofing.
 | Explore* Explore activities from Year 3 to Year 5 first, if applicable.
* Answer the question: What is an electrical circuit? Investigate the need for a complete circuit to allow electrical flow.
* Explore the features of electrical circuits and the difference between series and parallel circuits.
* Investigate the differences between electrical conductors and insulators.
* Investigate energy transformations and transferences in electrical circuits and everyday electrical devices.
* Investigate different ways electricity can be generated.
* Invite a local electrician to visit the class to talk about energy efficiency in the home in terms of the use of solar energy as a source of electricity.
* Conduct investigations and gather data using simple solar panels.
 |
| Explain* Recognise that objects can be seen when light from sources is available to illuminate them.
* Discuss the difference between direct and indirect light sources, e.g. sun vs. ambient.
* Identify the characteristics of sound and light used in everyday things.
* Conduct teacher-led discussions about why more and more homes in Queensland have solar panels.
 | Explain* Explain activities from Prep to Year 2 first, if applicable.
* Participate in demonstrations that explain the conduction of heat in solids and convection of heat in liquids and gases.
* Draw a flowchart to illustrate how a heat moves through solids, liquids and gases.
* Develop explanations about how shadows are formed and can change in size and shape.
* Review explanations and apply to the concept of the absorption of solar radiation in solar panels as a source of heat and electricity.
* Analyse data from investigations and draw conclusions about the best way to manage heat (and sound) in a house.
 | Explain* Explain activities from Year 3 to Year 5 first, if applicable.
* Participate in demonstrations that explain the conduction of electricity through circuits.
* Identify the difference between electrical transformation and transference in circuits.
* Identify the different uses for series and parallel circuits.
* Compare the efficiency and use of alternative sources of electricity.
* Research why sustainable sources of energy are being considered by communities.
* Analyse data from investigations and draw conclusions to inform the construction of the sustainable house.
 |
| Elaborate* Engage children with the assessment task where they identify and represent the observable features of objects around the school and home that are sources of light, sound (and heat) energy, and propose and test ways in which light and sound can be changed.
 | Elaborate* Engage students with the assessment task where they design an energy-efficient home using data collected from investigations during the term.
 | Elaborate* Engage students with the assessment task where they construct a wired home model and use it to investigate solar and battery sources of electricity.
 |
| Evaluate* Use the organisers of a KWLH chart to review and write about how their ideas about energy have changed.
* Discuss as a class how light and sound can be managed in a house.
* Find pictures of houses and rooms in houses as stimulus to discuss the management of light and sound heat in a house.
 | Evaluate* Use the organisers of a KWLH chart to review and write about how their ideas about energy have changed.
* Discuss as a class the wider use of solar energy as a source of heat.

Extend* Explore the role of light in our everyday lives, e.g:
* compact disc (CD) players
* grocery store checkouts
* digital cameras.
 | Evaluate* Use the organisers of a KWLH chart to review and write about how their ideas about energy have changed.
* Reflect on the house construction and discuss the effectiveness of the working model.
* Discuss the advantages and disadvantages of different sources of energy in house design.

**Extend*** Apply the concepts of an energy‑efficient home to an international context.
 |

| Use feedback |
| --- |
| Ways to monitor learning and assessment | Teachers collaboratively plan the teaching, learning and assessment to meet the needs of all learners.Before the multimodal assessment, teachers discuss task-specific descriptors of the quality of child/student performance. Where applicable, teachers individually mark all child/student responses, applying the shared understanding achieved through this calibration process. |
| Feedback to students | Teachers plan opportunities through the teaching strategies and learning experiences of the unit. Teachers provide ongoing feedback and encouragement to children/students on their strengths and areas for improvement. Through particular learning experiences children/students can reflect on and discuss with their teachers and peers what they are able to do well and what they need to do to improve. |
| Reflection on the unit plan | At the conclusion of the unit, all teachers who have been involved in planning, teaching, learning and assessment come together to reflect on the successes and challenges of the unit. They come with their personal reflections through answers to the following questions:* What worked well in this unit?
* What was a stumbling block?
* How would you refine it?
* What trends and gaps in learning have you identified?
* How will you build on these learning experiences next term and beyond?
 |