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>.

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| School name | Conceptual thread | Unit title | Year levels | Duration of unit |
| Our School | Forces | Sport | Prep to Year 7 | One term |

| Unit outline |
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| Through the context of sport, children/students will:* recognise that observation is an important part of exploring and investigating where forces are used in their everyday lives
* explore the role of forces in everyday objects and devices, in particular sporting equipment
* understand how scientific understandings, discoveries and inventions are used to ensure participants are safe when playing sports that involve forces.

Questions that shape the inquiry could include: * What is a force?
* What is a push? What is a pull? What is a twist?
* Why do some forces act on contact and others act at a distance?
* Where are forces in sport?
* Why do we wear helmets, seatbelts, knee pads and elbow pads when involved in sporting activities?
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Outlining the conceptual threads

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| Forces 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 |
| * The way objects move depends on a variety of factors, including their size and shape
* A push or a pull affects how an object moves or changes shape
 | * Forces can be exerted by one object on another through direct contact or from a distance
 | * Change to an object’s motion is caused by unbalanced forces acting on the object
* Earth’s gravity pulls objects towards the centre of the Earth
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| Elements of the conceptual thread across Prep to Year 5 |  | Elements of the conceptual thread across Years 3 to 7 |
| * The way objects move depends on a variety of factors, including their size and shape
* A push or a pull affects how an object moves or changes shape
* Forces can be exerted by one object on another through direct contact or from a distance
 | * Forces can be exerted by one object on another through direct contact or from a distance
* Change to an object’s motion is caused by unbalanced forces acting on the object
* Earth’s gravity pulls objects towards the centre of the Earth
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|  | Elements of the conceptual thread across Prep to Year 7 |  |
| * The way objects move depends on a variety of factors, including their size and shape
* A push or a pull affects how an object moves or changes shape
* Forces can be exerted by one object on another through direct contact or from a distance
* Change to an object’s motion is caused by unbalanced forces acting on the object
* Earth’s gravity pulls objects towards the centre of the Earth
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Context for the unit

Sport

| Identify curriculum |
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| Content descriptions to be taught |
| Prep to Year 2 |
| Science Understanding | Science as a Human Endeavour | Science Inquiry Skills |
| * The way objects move depends on a variety of factors, including their size and shape [(ACSSU005)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU005)
* A push or a pull affects how an object moves or changes shape [(ACSSU033)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU033)
 | 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)
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| Identify curriculum |
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| Content descriptions to be taught |
| Years 3 to 5 |
| Science Understanding | Science as a Human Endeavour | Science Inquiry Skills |
| * Forces can be exerted by one object on another through direct contact or from a distance [(ACSSU076)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU076)
 | 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)
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| Identify curriculum |
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| Content descriptions to be taught |
| Years 6 to 7 |
| Science Understanding | Science as a Human Endeavour | Science Inquiry Skills |
| * Change to an object’s motion is caused by unbalanced forces acting on the object [(ACSSU117)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU117)
* Earth’s gravity pulls objects towards the centre of the Earth [(ACSSU118)](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU118)
 | 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* 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)
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| Identify curriculum |
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| 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: Description: gc_numeracy Numeracy*** Make measurements and interpret data
* Analyse data to identify patterns
* Present graphs to represent data

Description: 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: 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: 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
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| Identify curriculum |
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| 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. |
| 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. |

| Identify curriculum |
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| 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 data displays
* Interpret secondary data presented in digital media and elsewhere
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| Assessment |
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| 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 |
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| 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 from investigations throughout the term that can be used to inform the design of the obstacle course.All children:* consider the objects provided by the teacher, e.g. equipment or pictures of playground equipment, hoops, balls, golf sticks, bats, ropes, tunnels, planks
* participate in a reflection circle to discuss where pushes and pulls could occur when using the equipment.

Children in Prep: * use an obstacle course constructed by the teacher, where they push objects and pull themselves through the course
* participate in a reflection circle to discuss where pushes and pulls occurred
* after teacher-led discussions, plan an obstacle course by ordering equipment and/or pictures
* draw a labelled diagram of the obstacle course to show where pushes and pulls occur

Children in Year 1 and Year 2:* conference with the teacher to discuss their plans for building an obstacle course, and identify the pushes and pulls in the course and the resources they need to construct it
* draw a labelled diagram of the obstacle course showing where pushes and pulls occur
* build the obstacle course
* test the obstacle course to check that pushes and pulls work
* refine the diagram and course if required
* 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.
 | 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 3 to Year 7**Experimental investigation: Model design and explanation (Multimodal)**Under the guidance of the teacher, students gather data from investigations throughout the term that can be used to inform the assessment.Students plan and conduct a fair test to gather quantitative data to model the effectiveness of sporting safety equipment, e.g. the use of seatbelts in racing cars, bike helmets on bikes, padding in cricket, mouthguards in football. * Students in Year 3 to Year 5 should make links between the effectiveness of the safety equipment and the strength of forces.
* Students in Year 6 to Year 7 should make links between the effectiveness of the safety equipment, strength of forces and material used to make the equipment.

Students present their results, findings and conclusions in a science 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 and 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-life problem

**Skills*** identification problems that can be
 |
|  |  | investigated scientifically and 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 |
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| 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 pushes, pulls and twists in sports

**Print*** word wall
* worksheets

**Equipment*** stimulus for the “Explore” phase: pictures and models of playground equipment, hoops, balls, golf sticks, bats, ropes, tunnels, planks, skateboards, bikes, cars, seatbelts, bike helmets, knee pads, elbow pads, mouthguards
* paper, crayons, pencils
* sporting equipment that use pushes, pulls and twists
* sporting safety equipment

**Safety equipment*** completed risk assessment
* safety glasses, where applicable
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| 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* Engage children’s/ students’ interest through pictures and models of playground equipment, hoops, balls, golf sticks, bats, ropes, tunnels, planks, skateboards, bikes, cars, seatbelts, bike helmets, knee pads, elbow pads and mouthguards.
* Begin to explore and discuss how things move and why.
* Brainstorm: What is a force? What is a push? What is a pull? What is a twist?
* Use a KWLH chart to establish children’s/students’ current knowledge about toys and machines by asking them to consider: What do I know? What do I want to know? Children/students add this to their science journal.
* Through a teacher-led discussion, look for similarities, group similar objects, and discuss why they have been grouped in this way. Include stimulus to discuss and to elicit exploration using question stems, e.g. How is … ? Why did … ? Where will … ? What might … ?
* Establish small mixed age groups with older students acting as scribes/facilitators. Encourage students to discuss the sports and safety equipment they have identified in class discussions and the pushes and pulls involved. They report back to whole class and discuss and explain any conflicting ideas.
* Create a word wall and question board to add to throughout the unit.
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| Explore * Pose questions about moving objects and use senses to make observations and to explore how the objects move.
* Answer the question: How do objects move?
* Respond to questions about moving objects and use senses to make observations and to explore how the objects move.
* Source interactive websites that show pushes and pulls causing movement in sport.
* Conduct simple investigations to explore how different strengths of pushes and pulls affect the movement of objects.
* Explore sporting equipment at school and from home that use pushes and pulls to move.
* Explore forces in sporting games that include kicking, hitting, running and jumping.
 | Explore* Explore activities from Prep to Year 2 first, if applicable.
* Answer the question: Why do we wear helmets, seatbelts, knee pads, elbow pads and mouthguards when involved in sporting activities?
* Reflect on everyday experiences and formulate questions about what students want to learn about forces and motion in sport. Students investigate the school slippery slide (if available) and discuss the forces involved.
* Plan and conduct fair tests to investigate forces that act on contact and that act at a distance, e.g. friction and magnetic forces.
* Conduct a tug-of-war investigation by changing variables. Predict outcomes and repeat the tug-of-war with one team wearing latex gloves. Predict outcomes and repeat the tug-of-war with detergent applied to the latex gloves.
 | Explore* Explore activities from Year 3 to Year 5 first, if applicable.
* Explore different types of balanced and unbalanced forces including friction, buoyancy, air resistance, and weight through work stations.
* Conduct a tug-of-war investigation by changing variables to investigate balanced and unbalanced forces.
* Investigate the difference between mass and weight.
* Conduct fair tests to investigate the effects of applying different forces to familiar objects to collect and represent quantitative data.
* Explore applications of gravity in sport, e.g. angles for hitting cricket balls.
* Carry out fair tests to investigate and collect quantitative data about the distance a ball travels when different forces are applied to it.
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| Explain* Participate in demonstrations and discussions to ensure understanding of the key concepts of push, pull, size, shape and movement.
* Draw arrows on diagrams to show the pushes and pulls when reviewing activities from the “Explore” phase.
* Discuss and explain the forces involved in the sports and games that the children play.
* Discuss how safety equipment can protect them from the forces involved in the sports and games that they play.
 | Explain* Explain activities from Prep to Year 2 first, if applicable.
* Analyse the data collected and observations made during investigations to identify patterns and trends about forces that act on contact and that act at a distance.
* Draw force arrow diagrams to show the forces when reviewing activities from the “Explore” phase.
* View multimedia resources showing forces in action in sport. Draw annotated force arrow diagrams.
* Refer to the role of safety equipment for managing forces in sport.
 | Explain* Explain activities from Year 3 to Year 5 first, if applicable.
* Analyse the data collected and observations made during investigations to identify patterns, trends and draw conclusions about balanced and unbalanced forces.
* Draw force arrow diagrams to represent situations where balanced and unbalanced forces are being applied to objects.
* Encourage students to explain balanced and unbalanced forces, including gravity, involved in sports and games that they play.
* Invite a local doctor/athlete to visit the class to talk about the role of safety equipment to prevent injuries in sport.
* Explain the role of safety equipment for managing forces in sport.
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| Elaborate* Engage children with the assessment task where they use or construct a push and pull obstacle course.
 | Elaborate* Engage students with the assessment task where they plan and conduct a fair investigation to gather quantitative data about the effectiveness of sporting safety equipment. They make links between the effectiveness of the safety equipment and the strength of forces.
 | Elaborate* Engage students with the assessment task where they plan and conduct a fair investigation to gather quantitative data about the effectiveness of sporting safety equipment. They make links between the effectiveness of the safety equipment, strength of forces and material used to make the equipment.
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| Evaluate* Use the organisers of a KWLH chart to review and write about how ideas about forces and motion and sport have changed.
* Conduct an audit of the sports equipment at school and at home that provides protection from forces in sport.
 | Evaluate* Use the organisers of a KWLH chart to review and write about how ideas about forces and motion and sport have changed.
* Reflect on the effectiveness of the investigation and any refinements that should be made in the future.
* Construct annotated force arrow diagrams representing the relative size of the forces displayed in the investigation.
 | Evaluate* Use the organisers of a KWLH chart to review and write about how ideas about forces and motion and sport have changed, including a written component.
* Reflect on the effectiveness of the investigation and any refinements that should be made in the future.
* Construct annotated force arrow diagrams representing the relative size of the forces displayed in the investigation.
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| Use feedback |
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| 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?
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