

How can PrimaryConnections support you to implement the NSW Syllabus for Australian Curriculum: Science K-6?

Key features

- ✓ An inquiry learning approach based on the 5Es teaching and learning model
- ✓ NSW outcomes correlation grid
- ✓ Fully aligned to the Australian Curriculum: Science
- ✓ Easy to use
- ✓ Embedded assessments
- ✓ Student-planned investigations
- ✓ Curriculum links to Science, Mathematics, English, History, Health & Physical Education and ICT



Primary**Connections** is an innovative program developed by the Australian Academy of Science, which links the teaching of science with the teaching of literacy in primary schools. The program provides quality curriculum resources and a professional learning program.

Primary**Connections** focuses on developing students' knowledge, understanding and skills in both science and literacy.

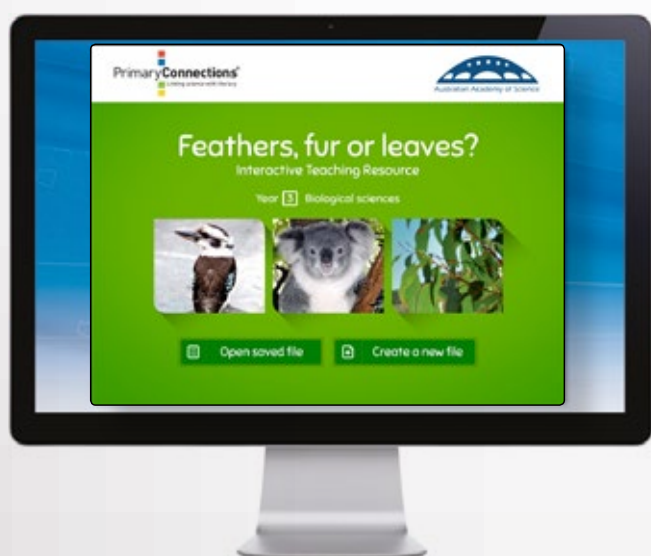
Key features:

- Inquiry and investigative approach
- Comprehensive professional learning program
- Award-winning curriculum resources linking science with literacy
- Research and evaluation program

Frequently Asked Questions

How can I use Primary**Connections** curriculum units to meet the requirements of the NSW Science K–10 (incorporating Science and Technology K–6 Syllabus)?

The Primary**Connections** units cover the Science outcomes of the NSW Syllabus for the Australian Curriculum for the following sub-strands: Working Scientifically (WS), Physical World (PW), Earth and Space (ES), Living World (LW) and Material World (MW). The NSW Syllabus includes all the Australian Curriculum science content descriptions, and identifies them with an Australian curriculum code, for example ACSIS233. These codes correspond to the codes presented in the Primary**Connections** units.



The Primary**Connections** units do not address the Technology components of the NSW K–6 Syllabus. However, the Primary**Connections** 5Es teaching and learning model can be used to develop units of work that will integrate Science and Technology. Professional learning will be available to assist teachers with this.

Adequate time to teach Science and Technology needs to be built into the school program. The NSW Board of Studies suggests as a guideline 6–10% of a typical teaching week (1.5 and 2.5 hours per week) should be allocated to Science and Technology.

Will Primary**Connections** write units to meet the requirements for the Australian Curriculum: Technology?

Until the final version of the Australian Curriculum: Technology has been released, there are no plans to write units to address the content. A draft of the Australian Curriculum: Technology released by ACARA in February 2013 was for consultation only, and will undergo processes of further review and rewrite before submission by ACARA to the State/Territory Ministers.

Several Primary**Connections** units already have aspects of technology and the design process embedded within them. Technology is broader than the use of Information Communication Technology (ICT) and involves solving real problems, and creating ideas and solutions in response to need. The design process allows students to use technology skills, knowledge and understanding to create solutions.





Feathers, fur or leaves? ITR

WINNER:

- **Outstanding Achievement**
– Interactive Media Awards 2015
- **Best Teaching Resource**
– Primary Educational Publishing Awards Australia 2015
- **Outstanding Digital Resource**
– Primary Educational Publishing Awards Australia 2015



NSW Syllabus for Australian Curriculum: Science K-6

Stage	Biological sciences	Chemical sciences	Earth and space sciences	Physical sciences	
ES1 (K)	  Staying alive	 ALTERNATIVE UNIT Growing well **	 What's it made of?	 Weather in my world	 On the move
ST1 (1-2)	  Schoolyard safari	 ALTERNATIVE UNIT Dinosaurs and more **	   ALTERNATIVE UNIT Bend it! Stretch it! **	 Up, down and all around	 Look! Listen!
	 Watch it grow! *	  All mixed up	 Water works	  Push-pull	
ST2 (3-4)	  Feathers, fur or leaves? *	  Melting moments	  Night and day	 Heating up	
	   Plants in action + Friends or foes? + Among the gum trees **	  Material world + Package it better	 Beneath our feet	   ALTERNATIVE UNIT Smooth moves + Magnetic moves **	
ST3 (5-6)	 Desert survivors	 What's the matter?	  Earth's place in space	 Light shows	
	 Marvellous micro-organisms	 ALTERNATIVE UNIT Rising salt **	 Change detectives	  ALTERNATIVE UNIT Earthquake explorers + Creators and destroyers **	   ALTERNATIVE UNIT Essential energy + Circuits and switches **



Unit overview: which units do I need?



Yr	Biological sciences	Chemical sciences	Earth and space sciences	Physical sciences				
F	 <input type="checkbox"/> Staying alive	 ALTERNATIVE UNIT <input type="checkbox"/> Growing well ☆	 <input type="checkbox"/> What's it made of?	 <input type="checkbox"/> Weather in my world	 <input type="checkbox"/> On the move			
1	 <input type="checkbox"/> Schoolyard safari	 ALTERNATIVE UNIT <input type="checkbox"/> Dinosaurs and more ☆	 <input type="checkbox"/> Spot the difference	 ALTERNATIVE UNIT <input type="checkbox"/> Bend it! Stretch it! ☆	 <input type="checkbox"/> Up, down and all around	 <input type="checkbox"/> Look! Listen!		
2	 <input type="checkbox"/> Watch it grow! *	 <input type="checkbox"/> All mixed up	 <input type="checkbox"/> Water works	 <input type="checkbox"/> Push-pull				
3	 <input type="checkbox"/> Feathers, fur or leaves? *	 <input type="checkbox"/> Melting moments	 <input type="checkbox"/> Night and day	 <input type="checkbox"/> Heating up				
4	 <input type="checkbox"/> Plants in action	 <input type="checkbox"/> Friends or foes?	 ALTERNATIVE UNIT <input type="checkbox"/> Among the gum trees ☆	 <input type="checkbox"/> Material world	 <input type="checkbox"/> Package it better	 <input type="checkbox"/> Beneath our feet	 <input type="checkbox"/> Smooth moves	 ALTERNATIVE UNIT <input type="checkbox"/> Magnetic moves ☆
5	 <input type="checkbox"/> Desert survivors	 <input type="checkbox"/> What's the matter?	 <input type="checkbox"/> Earth's place in space	 <input type="checkbox"/> Light shows				
6	 <input type="checkbox"/> Marvellous micro-organisms	 ALTERNATIVE UNIT <input type="checkbox"/> Rising salt ☆	 <input type="checkbox"/> Change detectives	 <input type="checkbox"/> Earthquake explorers	 ALTERNATIVE UNIT <input type="checkbox"/> Creators and destroyers ☆	 <input type="checkbox"/> Essential energy	 ALTERNATIVE UNIT <input type="checkbox"/> Circuits and switches ☆	



PrimaryConnections – unit overview

These units address the following Australian Curriculum Science Understandings:

Stage	Biological sciences	Chemical sciences	Earth and space sciences	Physical sciences
ES1 (K)	Staying alive or Growing well (ACSSU002) Living things have basic needs, including food and water.	What's it made of? (ACSSU003) Objects are made of materials that have observable properties.	Weather in my world (ACSSU004) Daily and seasonal changes in our environment, affect everyday life.	On the move (ACSSU005) The way objects move depends on a variety of factors, including their size and shape.
	Schoolyard safari or Dinosaurs and more (ACSSU017/211) Living things have a variety of external features. Living things live in different places where their needs are met.	Spot the difference or Bend it! Stretch it! (ACSSU018) Everyday materials can be physically changed in a variety of ways.	Up, down and all around (ACSSU019) Observable changes occur in the sky and landscape.	Look! Listen! (ACSSU020) Light and sound are produced by a range of sources and can be sensed.
ST1 (1–2)	Watch it grow (ACSSU030) Living things grow, change and have offspring similar to themselves.	All mixed up (ACSSU031) Different materials can be combined, including by mixing, for a particular purpose.	Water works (ACSSU032) Earth's resources, including water, are used in a variety of ways.	Push-pull (ACSSU033) A push or pull affects how an object moves or changes shape.
	Feathers, fur or leaves? (ACSSU044) Living things can be grouped on the basis of observable features and can be distinguished from non-living things.	Melting moments (ACSSU046) A change of state between solid and liquid can be caused by adding or removing heat.	Night and day (ACSSU048) Earth's rotation on its axis causes regular changes, including night and day.	Heating up (ACSSU049) Heat can be produced in many ways and can move from one object to another.
ST2 (3–4)	Plants in action and Friends or foes?, Among the gum trees (ACSSU072/073) Living things have life cycles. Living things depend on each other and the environment to survive.	Material world and Package it better (ACSSU074) Natural and processed materials have a range of physical properties that can influence their use.	Beneath our feet (ACSSU075) Earth's surface changes over time as a result of natural processes and human activity.	Smooth moves or Magnetic moves (ACSSU076) Forces can be exerted by one object on another through direct contact or from a distance.
	Desert survivors (ACSSU043) Living things have structural features and adaptations that help them to survive in their environment.	What's the matter? (ACSSU077) Solids, liquids and gases have different observable properties and behave in different ways.	Earth's place in space (ACSSU078) The Earth is part of a system of planets orbiting around a star (the sun).	Light shows (ACSSU080) Light from a source forms shadows and can be absorbed, reflected and refracted.
ST3 (5–6)	Marvellous micro-organisms or Rising salt (ACSSU094) The growth and survival of living things are affected by the physical conditions of their environment.	Change detectives (ACSSU095) Changes to materials can be reversible or irreversible.	Earthquake explorers or Creators and destroyers (ACSSU096) Sudden geological changes and extreme weather events can affect Earth's surface.	Circuits and switches or Essential energy (ACSSU097) Electrical energy can be transferred and transformed in electrical circuits and can be generated from a range of sources.

NSW Syllabus for Australian Curriculum: Science K–6

Stage	Biological sciences	Chemical sciences	Earth and space sciences	Physical sciences
ES1 (K)	Staying alive or Growing well STe-4WS STe-8NE (ACSSU002)	What's it made of? STe-4WS STe-9ME (ACSSU003)	Weather in my world STe-4WS STe-7NE (ACSSU004)	On the move STe-4WS STe-6NE (ACSSU005)
ST1 (1–2)	Schoolyard safari* ST1-4WS ST1-10LW ST1-11LW (ACSSU017) (ACSSU211)	Spot the difference* or Bend it! Stretch it!* ST1-4WS ST1-12MW (ACSSU018)	Up, down and all around ST1-4WS ST1-8ES (ACSSU019)	Look! Listen! ST1-4WS ST1-6PW (ACSSU020)
	Watch it grow* ST1-4WS ST1-10LW ST1-11LW (ACSSU030)	All mixed up* ST1-4WS ST1-12MW ST1-13MW (ACSSU031)	Water works ST1-4WS ST1-9ES (ACSSU032)	Push-pull ST1-4WS ST1-7PW (ACSSU033)
ST2 (3–4)	Feathers, fur or leaves?* ST2-4WS ST2-10LW (ACSSU044)	Melting moments* ST2-4WS ST2-12MW (ACSSU046)	Night and day ST2-4WS ST2-9ES (ACSSU048)	Heating up ST2-4WS ST2-6PW (ACSSU049)
	Plants in action* ST2-4WS ST2-10LW ST2-11LW (ACSSU072)	Material world* and Package it better* ST2-4WS ST2-13MW (ACSSU074)	Beneath our feet ST2-4WS ST2-8ES (ACSSU075)	Smooth moves or Magnetic moves ST2-4WS ST2-7PW (ACSSU076)
	Friends or foes?* ST2-4WS ST2-10LW ST2-11LW (ACSSU073)			
ST3 (5–6)	Desert survivors ST3-4WS ST3-10LW (ACSSU043)	What's the matter?* ST3-4WS ST3-12MW (ACSSU077)	Earth's place in space ST3-4WS ST3-8ES (ACSSU078)	Light shows ST3-4WS ST3-7PW (ACSSU080)
	Marvellous micro-organisms ST3-4WS ST3-11LW (ACSSU094)	Change detectives* ST3-4WS ST3-12MW (ACSSU095)	Earthquake explorers ST3-4WS ST3-9ES (ACSSU096)	It's electrifying* and Essential energy* ST3-4WS ST3-6PW (ACSSU097)

NSW Syllabus for Australian Curriculum: Science K–6 Outcomes

Stage	Working Scientifically	Natural Environment	Made Environment
ES1 (K)	<p>STe-4WS Explores their immediate surroundings by questioning, observing using their senses and communicating to share their observations and ideas</p> <ul style="list-style-type: none"> • Staying alive • What's it made of? • Weather in my world • On the move • Growing well 	<p>STe-6NE Identifies that the way objects move depends on a variety of factors</p> <ul style="list-style-type: none"> • On the move <p>STe-7NE Observes, using their senses, how daily and seasonal changes in the environment affect them and other living things</p> <ul style="list-style-type: none"> • Weather in my world <p>STe-8NE Identifies the basic needs of living things</p> <ul style="list-style-type: none"> • Staying alive • Growing well 	<p>STe-9ME Identifies that objects are made of materials that have observable properties</p> <ul style="list-style-type: none"> • What's it made of?
ST1 (1–2)	<p>ST1-4WS Investigate questions and predications by collecting and recording data, sharing and reflecting on their experiences and comparing what they and others know</p> <ul style="list-style-type: none"> • Look! Listen! • Push-pull • Up, down and all around • Water works • Spot the difference • All mixed up • Schoolyard safari • Watch it grow • Bend it! Stretch it! 	<p>Physical World</p> <p>ST1-6PW Describes some sources of light and sound that they sense in their daily lives</p> <ul style="list-style-type: none"> • Look! Listen! <p>ST1-7PW Describes effects of pushes and pulls on objects they encounter</p> <ul style="list-style-type: none"> • Push – pull <p>Earth & Space</p> <p>ST1-8ES Describes some observable changes that occur in the sky and landscape</p> <ul style="list-style-type: none"> • Up, down and all around <p>ST1-9ES Identifies ways that people use science in their daily lives to care for the environment and Earth's resources</p> <ul style="list-style-type: none"> • Water works <p>Living World</p> <p>ST1-10LW Describes external features, changes in and growth of living things</p> <ul style="list-style-type: none"> • Schoolyard safari • Watch it grow <p>ST1-11LW Describes ways that different places in the environment provide for the needs of living things</p> <ul style="list-style-type: none"> • Schoolyard safari • Watch it grow <p>Material World</p> <p>ST1-12MW Identifies ways that everyday materials can be physically changed and combined for a particular purpose</p> <ul style="list-style-type: none"> • Spot the difference • All mixed up • Bend it! Stretch it! <p>ST1-13MW Relates the properties of common materials to their use for particular purposes</p> <ul style="list-style-type: none"> • Spot the difference • All mixed up • Bend it! Stretch it! 	<p>ST1-12MW Identifies ways that everyday materials can be physically changed and combined for a particular purpose</p> <ul style="list-style-type: none"> • Spot the difference • All mixed up • Bend it! Stretch it! <p>Relates the properties of common materials to their use for particular purposes</p> <ul style="list-style-type: none"> • Spot the difference • All mixed up • Bend it! Stretch it!

NSW Syllabus for Australian Curriculum: Science K–6 Outcomes

Stage	Working Scientifically	Natural Environment	Made Environment
ST2 (3–4)	<p>ST2-4WS Investigates their questions and predications by analysing collected data, suggesting explanations for their findings, and communicating and reflecting on the processes undertaken</p> <ul style="list-style-type: none"> • Heating up • Smooth moves • Night and day • Beneath our feet • Melting moments • Material world • Package it better • Feathers, fur or leaves? • Plants in action • Friends or foes? • Magnetic moves 	<p>Physical World</p> <p>ST2-6PW Identifies ways heat is produced and that heat moves from one object to another</p> <ul style="list-style-type: none"> • Heating Up <p>ST2-7PW Describes everyday interactions between objects that result from contact and non-contact forces</p> <ul style="list-style-type: none"> • Smooth moves • Magnetic moves <p>Earth & Space</p> <p>ST2-8ES Describes some observable changes over time on the Earth’s surface that result from natural processes and human activity</p> <ul style="list-style-type: none"> • Beneath our feet <p>ST2-9ES Describes how relationships between the sun and the Earth cause regular changes</p> <ul style="list-style-type: none"> • Night and Day <p>Living World</p> <p>ST2-10LW Describes that living things have life cycles, can be distinguished from non-living things and grouped, based on their observable features</p> <ul style="list-style-type: none"> • Feathers, fur or leaves? • Plants in action • Friends or foes? <p>ST2-11LW Describes ways that science knowledge helps people understand the effect of their actions on the environment and on the survival of living things</p> <ul style="list-style-type: none"> • Plants in action • Friends or foes? <p>Material World</p> <p>ST2-12MW Identifies that adding or removing heat causes a change of state between solids and liquids</p> <ul style="list-style-type: none"> • Melting moments <p>ST2-13MW Identifies the physical properties of natural and processed materials, and how these properties influence their use</p> <ul style="list-style-type: none"> • Material world • Package it better 	<p>ST2-12MW Identifies that adding or removing heat causes a change of state between solids and liquids</p> <ul style="list-style-type: none"> • Melting moments <p>ST2-13MW Identifies the physical properties of natural and processed materials, and how these properties influence their use</p> <ul style="list-style-type: none"> • Material world • Package it better

NSW Syllabus for Australian Curriculum: Science K–6 Outcomes

Stage	Working Scientifically	Natural Environment	Made Environment
ST3 (5–6)	<p>ST3-4WS Investigates by posing questions, including testable questions, making predictions and gathering data to draw evidence-based conclusions and develop explanations</p> <ul style="list-style-type: none">• Light Shows• It's electrifying• Essential energy• Earth's place in space• Earthquake explorers• What's the matter?• Desert survivors• Marvellous micro-organisms• Volcanoes	<p>Physical World</p> <p>ST3-6PW Describes how scientific understanding about the sources, transfer and transformation of electricity is related to making decisions about its use</p> <ul style="list-style-type: none">• It's electrifying• Essential energy <p>ST3-7PW Uses scientific knowledge about the transfer of light to solve problems that directly affect peoples lives</p> <ul style="list-style-type: none">• Light shows <p>Earth & Space</p> <p>ST3-8ES Describes how discoveries by people from different cultures and times have contributed to advancing scientific understanding of the solar system</p> <ul style="list-style-type: none">• Earth's place in space <p>ST3-9ES Explains rapid changes at the Earth's surface caused by natural events, using evidence provided by advances in technology and scientific understanding</p> <ul style="list-style-type: none">• Earthquake explorers• Volcanoes <p>Living World</p> <p>ST3-10LW Describes how structural features and other adaptations of living things help them to survive in their environment</p> <ul style="list-style-type: none">• Desert survivors <p>ST3-11LW Describes some physical conditions of the environment and how these affect the growth and survival of living things</p> <ul style="list-style-type: none">• Marvellous micro-organisms <p>Material World</p> <p>ST3-12MW Identifies the observable properties of solids, liquids and gases, and that changes made to materials are reversible or irreversible</p> <ul style="list-style-type: none">• What's the matter• Change detectives	<p>ST3-12MW Identifies the observable properties of solids, liquids and gases, and that changes made to materials are reversible or irreversible</p> <ul style="list-style-type: none">• What's the matter?• Change detectives

Alignment with the Australian Curriculum: Science

This Light shows unit embeds all three strands of the Australian Curriculum: Science. The table below lists sub-strands and their content for Year 5. This unit is designed to be taught in conjunction with other Year 5 units to cover the full range of the Australian Curriculum: Science content for Year 5. For ease of assessment the table below outlines the sub-strands and their aligned lessons.

Strand	Sub-strand	Code	Year 5 content descriptions	Lessons
Science Understanding	Chemical science	ACSSU000	Light from a source forms shadows and can be absorbed, reflected and refracted.	1-8
	Nature and development of science	ACSHED01	Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena.	1, 4, 5
Science as a Human Endeavour	Use and influence of science	ACSHED03	Scientific understandings, discoveries and inventions are used to solve problems that directly affect people's lives.	1, 5, 8
		ACSHED11	Scientific knowledge is used to inform personal and community decisions.	4
Science Inquiry Skills	Questioning and predicting	ACSIQ231	With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be.	1, 2, 5, 6, 7
	Planning and conducting	ACSIQ06	With guidance, plan appropriate investigation methods to answer questions or solve problems.	2, 3, 5, 6, 7
		ACSIQ07	Decide which variable should be changed and tested in fair tests and accurately observe, measure and record data, using digital technologies as appropriate.	5, 6, 7
		ACSIQ08	Use equipment and materials safely, identifying potential risks.	5, 7
	Processing and analysing data and information	ACSIQ00	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.	3, 4, 6, 7
		ACSIQ218	Compare data with predictions and use its evidence in developing explanations.	5
	Evaluating	ACSIQ01	Suggest improvements to the methods used to investigate a question or solve a problem.	7
	Communicating	ACSIQ03	Communicate ideas, explanations and proposals in a variety of ways, including multimodal texts.	2, 3, 4, 5, 6, 8

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

About our resources

Australian Curriculum

PrimaryConnections resources are fully aligned with the Australian Curriculum: Science including the general capabilities and the cross-curriculum priorities as they relate to Science, Mathematics and English.

Literacy Focus

These are embedded in every unit to assist students to use their everyday literacies to think about, reason and represent their understanding of science through the use of science journals, graphs, Venn diagrams, tables and word walls.

12 Model for the class how to construct a graph to visually represent the information recorded in the table. Discuss the purpose and features of a graph.

Literacy focus

Why do we use a graph?
We use a **graph** to organise information so we can look for patterns. We use different types of graphs, such as picture, column, or line graphs for different purposes.

What does a graph include?
A **graph** includes a title, axes with labels on them and the units of measurement.

Example of a graph

Lesson 7 Big shadow, little shadow 63

Appendix 10
Light shows unit overview

	SCIENCE OUTCOMES*	LITERACY OUTCOMES*	LESSON SUMMARY	ASSESSMENT OPPORTUNITIES
ENGAGE	Lesson 1 Light shows	Students will be able to represent their current understandings in their:	Lesson 1 Students will be able to:	Diagnostic assessment • Science journal writing • Class discussion • Science chat board and word wall construction • 'No thoughts' (Pre-lesson sheet 1) • 'In the dark' (Pre-lesson sheet 2)
	Lesson 2 In the dark	Students will be able to:	Students will be able to:	

Unit resources include:

- Easy to follow unit structure
- Extensive teacher background information
- Student conceptions – taking account of students' existing ideas about science
- Clear lesson steps to support teachers
- 'How to' appendices
- Guidelines for diagnostic, formative and summative assessment
- Equipment lists
- Blackline masters

Appendix 6
How to conduct a fair test

Introduction
Scientists investigate and testing hypotheses, collecting and recording evidence and drawing conclusions and communicating findings.

Planning a fair test

Will the angle of the torch affect the height of the shadow?

Will the distance of the torch from the object affect the height of the shadow?

Will the type of torch affect the height of the shadow?

Things that affect the shadow height of an object.

Things that can be changed in an investigation.

Things that can be kept the same in an investigation.

Things that can be changed in a fair test, we keep the same in an investigation.

Things that can be kept the same in an investigation, we change them in a fair test.

Things that can be changed in a fair test, we keep the same in an investigation.

Things that can be kept the same in an investigation, we change them in a fair test.

Control: 'Biffy' is a name applied to the variable that is kept the same in an investigation.

Measure/Observe: 'Biffy' is a name applied to the variable that is changed in an investigation.

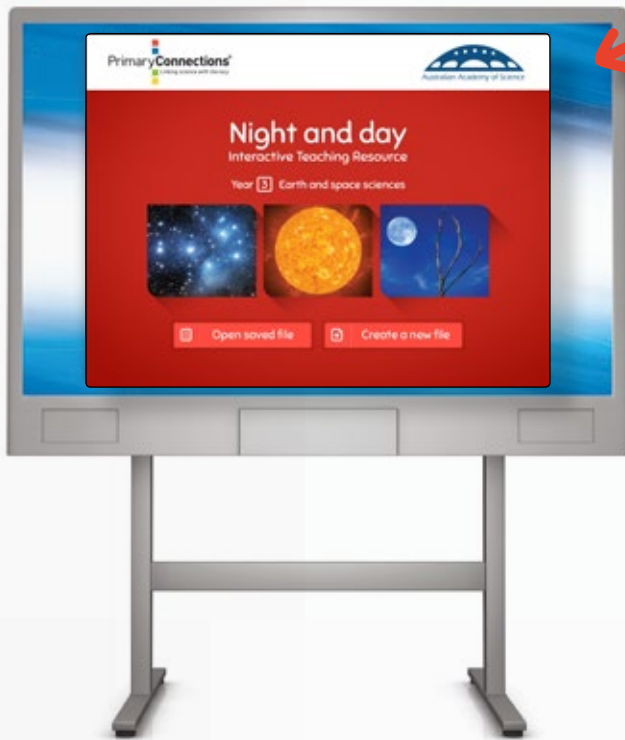
Table: Keep the same things (control variables) the same in an investigation.

To investigate the angle of the torch affects the shadow height of an object.

CHANGE	MEASURE	KEEP THE SAME
the distance from the torch to the stick	the height of the shadow of an object	the position of the stick, the position of the stick on the table, the position of the stick on the table, the angle of the torch and the height of the stick

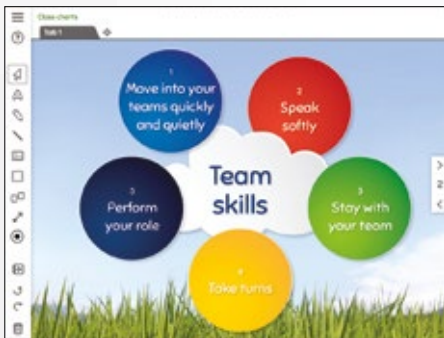
Interactive Teaching Resources

The Interactive Teaching Resources (ITRs) bring the units to life in the classroom, save you time and make teaching science easy and fun for teachers.



Key features

- Easy to use for both teachers and students
- Provides full-colour interactive versions of all student activities from the units including:
 - Science journal
 - Word wall
 - Glossary
 - TWLH chart
 - Team charts
 - Science question starters.



Professional Learning 2016

The professional learning program lies at the heart of PrimaryConnections and is designed to build teacher confidence and improve student outcomes in science and literacy.

To view our training calendar for 2016 visit www.primaryconnections.org.au.

To find out more about our teaching and learning resources please visit our website: www.primaryconnections.org.au