

Fully aligned
with the Australian
Curriculum

The
PrimaryConnections
program is supported by
astronomer, Professor
Brian Schmidt,
2011 Nobel Laureate

Staying alive

Foundation Year

Biological sciences



PrimaryConnections project

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Professional learning program

The Primary**Connections** program includes a sophisticated professional learning component and exemplary curriculum resources. Research shows that this combination is more effective than using each in isolation.

Professional Learning Facilitators are available throughout Australia to conduct workshops on the underpinning principles of the program: the Primary**Connections** 5Es teaching and learning model, linking science with literacy, investigating, embedded assessment and collaborative learning.

The Primary**Connections** website has contact details for state and territory Professional Learning Coordinators, as well as additional resources for this unit. Visit the website at:

www.science.org.au/primaryconnections

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All animals, including humans, use their sensory organs to gather information about their environment. The sharp eye, the cocked ear, or the careful sniffing of air can warn animals of dangers that might threaten their survival. Humans use senses to gather information not only critical for our immediate safety, but also for planning to meet our basic needs for things such as food, water and shelter.

The *Staying alive* unit is an ideal way to link science with literacy in the classroom. It provides opportunities for students to investigate the basic needs for survival of animals, including humans, and how their senses help them stay alive. Students' understanding of basic needs and their importance in our lives will be developed through hands-on activities. Through investigations, students will explore the needs of a class pet and compare them to their own needs.



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Foreword

The Australian Academy of Science is proud of its long tradition of supporting and informing science education in Australia. 'PrimaryConnections: linking science with literacy' is its flagship primary school science program, and it is making a real difference to the teaching and learning of science in Australian schools.

The PrimaryConnections approach has been embraced by schools since its inception in 2004, and there is substantial evidence of its effectiveness in helping teachers transform their practice. It builds teacher confidence and competence in this important area, and helps teachers use their professional skills to incorporate elements of the approach into other areas of the curriculum. Beginning and pre-service teachers find the approach doable and sustainable. PrimaryConnections students enjoy science more than in comparison classes and Indigenous students, in particular, show significant increases in learning using the approach.

The project has several components: professional learning, curriculum resources, research and evaluation, and Indigenous perspectives. With the development of an Australian curriculum in the sciences by ACARA in December 2010, it is an exciting time for schools to engage with science and to raise the profile of primary science education.

Students are naturally curious. PrimaryConnections provides an inquiry-based approach that helps students develop deep learning, and guides them to find scientific ways to answer their questions. The lessons include key science background information, and further science information is included on the PrimaryConnections website.

Science education provides a foundation for a scientifically literate society; which is so important for engagement in key community debates such as climate change, carbon emissions and immunisation, as well as for personal decisions about health and well-being. The inquiry approach in PrimaryConnections prepares students to participate in evidence-based discussions of these and other issues.

PrimaryConnections has been developed with the financial support of the Australian Government, and has been endorsed by education authorities across the country. The Steering Committee, comprising the Department of Education, Employment and Workplace Relations and Academy representatives, and the Reference Group, which includes representatives from all stakeholder bodies including states and territories, have provided invaluable guidance and support. Before publication, the teacher background information on science is reviewed by a Fellow of the Academy of Science. All these inputs have ensured an award-winning, quality program.

The Fellows of the Academy are committed to ongoing support for teachers of science at all levels. I commend PrimaryConnections to you and wish you well in your teaching.

Professor Suzanne Cory, AC PresAA FRS

President

Australian Academy of Science

2010–2013

The PrimaryConnections program

Primary**Connections** is an innovative program that links the teaching of science and literacy in the primary years of schooling. It is an exciting and rewarding approach for teachers and students, with a professional learning program and supporting curriculum resources. Further information about professional learning and other curriculum support can be found on the Primary**Connections** website: www.science.org.au/primaryconnections

The PrimaryConnections teaching and learning model

This unit is one of a series designed to exemplify the Primary**Connections** teaching and learning approach; which embeds inquiry-based learning into a modified 5Es instructional model, with the five phases: *Engage*, *Explore*, *Explain*, *Elaborate* and *Evaluate* (Bybee, 1997). The relationship between the 5Es phases, investigations, literacy products and assessment is illustrated below:

Primary**Connections** 5Es teaching and learning model

Phase	Focus	Assessment focus
ENGAGE	Engage students and elicit prior knowledge	Diagnostic assessment
EXPLORE	Provide hands-on experience of the phenomenon	Formative assessment
EXPLAIN	Develop scientific explanations for observations and represent developing conceptual understanding Consider current scientific explanations	Formative assessment
ELABORATE	Extend understanding to a new context or make connections to additional concepts through a student-planned investigation	Summative assessment of the Science Inquiry Skills
EVALUATE	Students re-represent their understanding and reflect on their learning journey and teachers collect evidence about the achievement of outcomes	Summative assessment of the Science Understanding

More information on Primary**Connections** 5Es teaching and learning model can be found at: www.science.org.au/primaryconnections/teaching-and-learning

Developing students' scientific literacy

The learning outcomes in Primary**Connections** contribute to developing students' scientific literacy. Scientific literacy is considered the main purpose of school science education and has been described as an individual's:

- scientific knowledge and use of that knowledge to identify questions, acquire new knowledge, explain scientific phenomena and draw evidence-based conclusions about science-related issues
- understanding of the characteristic features of science as a form of human knowledge and enquiry
- awareness of how science and technology shape our material, intellectual and cultural environments
- willingness to engage in science-related issues, and with the ideas of science, as a reflective citizen (Programme for International Student Assessment & Organisation for Economic Co-operation and Development, 2009).

Linking science with literacy

PrimaryConnections has an explicit focus on developing students' knowledge, skills, understanding and capacities in science and literacy. Units employ a range of strategies to encourage students to think about and to represent science.

PrimaryConnections develops the literacies of science that students need to learn and to represent their understanding of science concepts, processes and skills. Representations in PrimaryConnections are multi-modal and include text, tables, graphs, models, drawings and embodied forms, such as gesture and role-play. Students use their everyday literacies to learn the new literacies of science. Science provides authentic contexts and meaningful purposes for literacy learning; and also provides opportunities to develop a wider range of literacies. Teaching science with literacy improves learning outcomes in both areas.

Assessment

Assessment against the year level achievement standards of the Australian Curriculum: Science (ACARA, 2012) is ongoing and embedded in PrimaryConnections units.

Assessment is linked to the development of literacy practices and products. Relevant understandings and skills are highlighted at the beginning of each lesson. Different types of assessment are emphasised in different phases:



Diagnostic assessment occurs in the *Engage* phase. This assessment is to elicit students' prior knowledge so that the teacher can take account of this when planning how the *Explore* and *Explain* lessons will be implemented.



Formative assessment occurs in the *Explore* and *Explain* phases. This enables the teacher to monitor students' developing understanding and provide feedback that can extend and deepen students' learning.



Summative assessment of the students' achievement developed throughout the unit occurs in the *Elaborate* phase for the Science Inquiry Skills, and in the *Evaluate* phase for the Science Understanding.

Alignment with the Australian Curriculum: Science

The Australian Curriculum: Science has three interrelated strands—Science Understanding, Science as a Human Endeavour and Science Inquiry Skills—that together ‘provide students with understanding, knowledge and skills through which they can develop a scientific view of the world.’ (ACARA, 2012).

The content of these strands is described by the Australian Curriculum as:


Science Understanding	
Biological sciences	Understanding living things
Chemical sciences	Understanding the composition and behaviour of substances
Earth and space sciences	Understanding Earth’s dynamic structure and its place in the cosmos
Physical sciences	Understanding the nature of forces and motion, and matter and energy
Science as a Human Endeavour	
Nature and development of science	An appreciation of the unique nature of science and scientific knowledge
Use and influence of science	How science knowledge and applications affect people’s lives and how science is influenced by society and can be used to inform decisions and actions
Science Inquiry Skills	
Questioning and predicting	Identifying and constructing questions, proposing hypotheses and suggesting possible outcomes
Planning and conducting	Making decisions regarding how to investigate or solve a problem and carrying out an investigation, including the collection of data
Processing and analysing data and information	Representing data in meaningful and useful ways, identifying trends, patterns and relationships in data, and using evidence to justify conclusions
Evaluating	Considering the quality of available evidence and the merit or significance of a claim, proposition or conclusion with reference to that evidence
Communicating	Conveying information or ideas to others through appropriate representations, text types and modes

 All the material in this table is sourced from the Australian Curriculum.

There will be a minimum of four Primary**Connections** units for each year of primary school from Foundation to Year 6—at least one for each Science Understanding sub-strand of the Australian Curriculum. Each unit contains detailed information about its alignment with all aspects of the Australian Curriculum: Science and its links to the Australian Curriculum: English and Mathematics.



Safety

Learning to use materials and equipment safely is central to working scientifically. It is important, however, for teachers to review each lesson before teaching, to identify and manage safety issues specific to a group of students. A safety icon  is included in lessons where there is a need to pay particular attention to potential safety hazards. The following guidelines will help minimise risks:

- Be aware of the school's policy on safety in the classroom and for excursions.
- Check students' health records for allergies or other health issues.
- Be aware of potential dangers by trying out activities before students do them.
- Caution students about potential dangers before they begin an activity.
- Clean up spills immediately as slippery floors are dangerous.
- Instruct students never to taste, smell or eat anything unless they are given permission.
- Discuss and display a list of safe practices for science activities.

References

Australian Curriculum Assessment and Reporting Authority (ACARA). (2012). *Australian Curriculum: Science*. www.australiancurriculum.edu.au

Bybee, R.W. (1997). *Achieving scientific literacy: from purposes to practical action*. Portsmouth, NH: Heinemann.

Programme for International Student Assessment & Organisation for Economic Co-operation and Development. (2009). *PISA 2009 assessment framework: key competencies in reading, mathematics and science*. Paris: OECD Publishing.

Unit at a glance

Staying alive

Phase	Lesson	At a glance
ENGAGE	Lesson 1 Handle with care Session 1 Our new friend Session 2 Meet my pet	To capture students' interest and find out what they think they know about how living things have basic needs, including food and water. To elicit students' questions about the basic needs of animals, including humans.
	Lesson 2 Stretch your senses Session 1 Sorting our senses Session 2 Senses detectives	To provide students with hands-on, shared experiences of the senses and how senses help animals, including humans, survive in their environment.
EXPLORE	Lesson 3 Move it! Session 1 Chomp, chomp! Session 2 Huff and puff Session 3 Slurp and see	To provide students with hands-on, shared experiences to explore how animals, including humans, need air, food and water.
	Lesson 4 Space and shelter	To provide students with hands-on, shared experiences to explore how animals, including humans, need space and shelter.
	Lesson 5 Take it or leave it	To support students to represent and explain their understanding of the basic needs of animals, including humans, and to introduce current scientific views.
ELABORATE	Lesson 6 How much water do I need?	To support students to plan and conduct an investigation comparing the water needs of people and the class pet.
EVALUATE	Lesson 7 Sensational reviews	To provide opportunities for students to represent what they know about how living things have basic needs, including food and water, and to reflect on their learning during the unit.


A unit overview can be found in Appendix 5, page 72.

Alignment with the Australian Curriculum: Science

This *Staying alive* unit embeds all three strands of the Australian Curriculum: Science. The table below lists sub-strands and their content for Foundation Year. This unit is designed to be taught in conjunction with other Foundation Year units to cover the full range of the Australian Curriculum: Science content for Foundation Year.

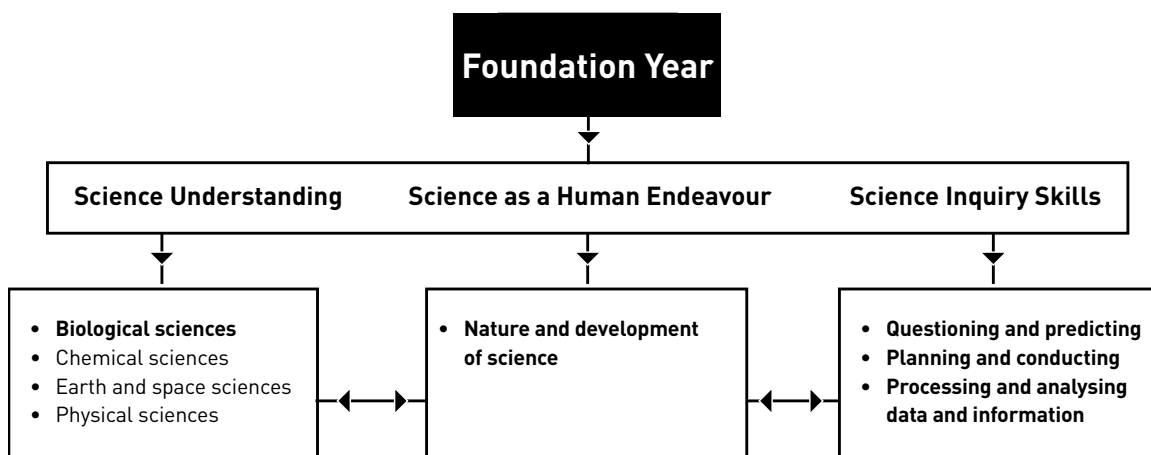
For ease of assessment the table below outlines the sub-strands and their content aligned to lessons.

Strand	Sub-strand	Code	Foundation Year content descriptions	Lesson
Science Understanding	Biological sciences	ACSSU002	Living things have basic needs, including food and water	1–7
Science as a Human Endeavour	Nature and development of science	ACSHE013	Science involves exploring and observing the world using the senses	1–7
Science Inquiry Skills	Questioning and predicting	AC SIS014	Respond to questions about familiar objects and events	1–7
	Planning and conducting	AC SIS011	Explore and make observations by using the senses	1–7
	Processing and analysing data and information	AC SIS233	Engage in discussions about observations and use methods such as drawing to represent ideas	1–7
	Communicating	AC SIS012	Share observations and ideas	1–7

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

Interrelationship of the Science strands

The interrelationship between the three strands — Science Understanding, Science as a Human Endeavour and Science Inquiry Skills — and their sub-strands is shown below. Sub-strands covered in this unit are in bold.



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

Relationship to overarching ideas

In the Australian Curriculum: Science, six overarching ideas support the coherence and developmental sequence of science knowledge within and across year levels. In *Staying alive* these overarching ideas are represented by:

Overarching idea	Incorporation in <i>Staying alive</i>
Patterns, order and organisation	Students compare similarities and differences in the survival needs of humans and the class pet. They identify patterns such as water consumption and how breathing increases after exercise. They sort objects according to whether or not they are needed for survival.
Form and function	Students explore how their senses are used to gather information from their environment and are used to keep them safe. They compare what happens to their bodies before and after exercise, and consider the need for food, water, air and shelter for their bodies to survive.
Stability and change	Students discuss how their needs can change over the course of a day, for example, their hunger increases when they have not eaten recently. However, they identify that without an overall constant supply of food, air and water and sleep animals can't survive.
Scale and measurement	Students compare the needs of different people and the class pet using informal measurements to record their water consumption. They compare observations to discuss the relative needs of animals of different sizes.
Matter and energy	Students investigate the consumption of food by animals in order to survive. They describe and measure this consumption (intake of energy) and how it is needed for growth, change and survival.
Systems	Through comparing what different animals eat, students are introduced to some simple relationships between living things in ecosystems. They also identify inputs necessary for the maintenance of the body systems of animals.

Curriculum focus

The Australian Curriculum: Science is described by year level, but provides advice across four year groupings on the nature of learners. Each year grouping has a relevant curriculum focus.

Curriculum focus Years F–2	Incorporation in <i>Staying alive</i>
Awareness of self and the local world	Students use their senses to gather information about their world. They respond to and ask questions about what they need to survive and compare their needs with those of the class pet.

Achievement standards

The achievement standards of the Australian Curriculum: Science indicates the quality of learning that students typically demonstrate by a particular point in their schooling, for example, at the end of a year level. These standards will be reviewed regularly by ACARA and are available on the ACARA website.

By the end of this unit, teachers will be able to make evidence-based judgments on whether the students are achieving below, at or above the Australian Curriculum: Science Foundation Year achievement standard. Rubrics to help teachers make these judgments will be available on the website:

www.science.org.au/primaryconnections/curriculum-resources





General capabilities


The skills, behaviours and attributes that students need to succeed in life and work in the 21st century have been identified in the Australian Curriculum as General capabilities. There are seven general capabilities and they are embedded throughout the curriculum.

For further information see: www.australiancurriculum.edu.au/GeneralCapabilities/Overview/General-capabilities-in-the-Australian-Curriculum

For examples of our unit-specific General capabilities information see the next page.

Staying alive – Australian Curriculum general capabilities

General capabilities	Australian Curriculum description	Staying alive examples
<p>Literacy</p>	<p>Literacy knowledge specific to the study of science develops along with scientific understanding and skills.</p> <p>Primary Connections learning activities explicitly introduce literacy focuses and provide students with the opportunity to use them as they think about, reason and represent their understanding of science.</p>	<p>In <i>Staying alive</i> the literacy focuses are:</p> <ul style="list-style-type: none"> • tables • science journals • ideas maps • word walls • T-charts • storyboards • sorting diagrams • graphs.
<p> Numeracy</p>	<p>Elements of numeracy are particularly evident in Science Inquiry Skills. These include practical measurement and the collection, representation and interpretation of data.</p>	<p>Students:</p> <ul style="list-style-type: none"> • collect data in tables • represent and communicate data in tables and simple picture graphs • interpret data in graphs and tables.
<p>Information and communication technology (ICT) competence</p>	<p>ICT competence is particularly evident in Science Inquiry Skills. Students use digital technologies to investigate, create, communicate and share ideas and results.</p>	<p>Students are given optional opportunities to:</p> <ul style="list-style-type: none"> • use digital devices to record their explorations • use interactive resource technology to view, record and analyse information.
<p> Critical and creative thinking</p>	<p>Students develop critical and creative thinking as they speculate and solve problems through investigations, make evidence-based decisions, and analyse and evaluate information sources to draw conclusions. They develop creative questions and suggest novel solutions.</p>	<p>Students:</p> <ul style="list-style-type: none"> • formulate, pose and respond to questions for inquiry • consider different ways of thinking about what their bodies require • make evidence-based decisions about their basic needs for survival.
<p>Ethical behaviour</p>	<p>Students develop ethical behaviour as they explore principles and guidelines in gathering evidence, and consider the implications of their investigations on others and the environment.</p>	<p>Students:</p> <ul style="list-style-type: none"> • ask questions respecting each other's point of view • develop and use a 'Code for Caring' when caring for the class pet.
<p> Personal and social competence</p>	<p>Students develop personal and social competence as they work effectively in teams, develop collaborative methods of inquiry, work safely, and use their scientific knowledge to make informed choices.</p>	<p>Students:</p> <ul style="list-style-type: none"> • work collaboratively in teams • participate in discussions • follow directions to work safely • follow rules when playing physical games.
<p> Intercultural understanding</p>	<p>Intercultural understanding is particularly evident in Science as a Human Endeavour. Students learn about the influence of people from a variety of cultures on the development of scientific understanding.</p>	<ul style="list-style-type: none"> • 'Cultural perspectives' opportunities are highlighted where relevant. • Important contributions made to science by people from a range of cultures are highlighted where relevant.

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

Cross curriculum priorities

There are three cross curriculum priorities identified by the Australian Curriculum:

- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability.

Two of these are embedded within this unit as described below. For further information see: www.australiancurriculum.edu.au/CrossCurriculumPriorities



Aboriginal and Torres Strait Islander histories and cultures

PrimaryConnections has developed an Indigenous perspective framework that has informed practical reflections on intercultural understanding. It can be accessed at:

www.science.org.au/primaryconnections/indigenous

Staying alive focuses on the Western science way of making evidence-based claims about things required for survival.

Indigenous cultures might have different explanations about the needs for survival, and they might prioritise their relative importance in different ways depending on their culture. PrimaryConnections recommends working with Indigenous community members to access contextualised, relevant Indigenous perspectives.

Sustainability

In the *Staying alive* unit, students investigate how animals rely on their environment to survive. They are also introduced to the concept that all living things have basic requirements that need to be met, for example water and space. These concepts can help students to understand the idea of competition for scarce resources and how impacts on the environment might affect the survival of living things. This enables students to develop the knowledge, skills and values for making decisions about individual and community actions that contribute to sustainable patterns of use of the Earth's natural resources.

Alignment with the Australian Curriculum: English and Mathematics

Strand	Sub-strand	Code	Foundation Year content descriptions	Lessons
English – Language	Language for interaction	ACELA1429	Understand that language can be used to explore ways of expressing needs, likes and dislikes.	1–7
	Expressing and developing ideas	ACELA1434	Recognise that texts are made up of words and groups of words that make meaning	1–7
		ACELA1437	Understand the use of vocabulary in familiar contexts related to everyday experiences, personal interests and topics taught at school	1–7
English – Literacy	Interacting with others	ACELY1646	Listen to and respond orally to texts and to the communication of others in informal and structured classroom situations	1–7
		ACELY1784	Use interaction skills including listening while others speak, using appropriate voice levels, articulation and body language, gestures and eye contact	1–7
		ACELY1647	Deliver short oral presentations to peers	1
	Creating texts	ACELY1651	Create short texts to explore, record and report ideas and events using familiar words and beginning writing knowledge	1, 3, 7
Mathematics – Number and Algebra	Number and place value	ACMNA289	Compare, order and make correspondences between collections, initially to 20, and explain reasoning	6
		ACMNA004	Represent practical situations to model addition and sharing	6
	Patterns and algebra	ACMNA005	Sort and classify familiar objects and explain the basis for these classifications. Copy, continue and create patterns with objects and drawings	3, 5, 6
Mathematics – Measurement and Geometry	Using units of measurement	ACMMG006	Use direct and indirect comparisons to decide which is longer, heavier or holds more, and explain reasoning in everyday language	6
		ACMMG007	Compare and order the duration of events using the everyday language of time	3

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

Other links are highlighted at the end of lessons where possible. These links will be revised and updated on the website: www.science.org.au/primaryconnections/curriculum-resources

Teacher background information

Introduction to the survival of living things

The world is filled with a vast number of different living things. Although they are diverse, all living things grow, move and reproduce. Some living things, such as animals, can move voluntarily, whereas plants are moved by external influences, for example, the wind. Plants can also grow towards light and send roots downward with the pull of gravity.

Living things, including humans and other animals, have needs which must be met for them to stay alive. Some needs, such as food, water and oxygen, are common to all living things. Others, for example, shelter, will depend on the type of organism and the environment in which they live. The word 'animals' includes groups such as mammals (including humans), fish, insects, sponges, corals, amphibians, reptiles, birds, spiders, crabs, snails, clams, leeches and worms. All of these animals have different characteristics and abilities which allow them to meet their basic needs in different ways.

To survive, many animals need shelter from extremes of temperature and protection from predators. Organisms also need to be able to identify sources of air, nutrients and water in the environment, and to identify and avoid hazards. Animals have senses that provide information about the environment. Light, chemicals in the air and sound are examples of information that different sensory organs can detect.

Growth and repair of tissues, movement and reproduction are processes that require energy and nutrients. Energy and essential nutrients are obtained from food and water. Oxygen is also needed to release energy from food. Any water produced by the body needs to be removed. Fresh water must also be taken in to keep the body hydrated.

Plants and algae can absorb energy in the form of radiation from the Sun and create sugars using carbon dioxide and water. This process is called photosynthesis. Animals cannot obtain energy using photosynthesis. Energy is obtained by consuming plants and other animals.

Students' conceptions

Taking account of students' existing ideas is important in planning effective teaching approaches which help students learn science. Students develop their own ideas during their experiences in everyday life and might hold more than one idea about an event or phenomenon.

Students quickly link life with movement but less often with eating, breathing and reproducing. Hence they might identify lightning as being alive, but not a plant—unless the plant is doing something associated with movement or growth. Many students do not identify trees as being alive, particularly deciduous trees in winter.

Students might believe that life spontaneously appears from non-living things. For example, a butterfly comes from an immobile pupa, which students might believe is not alive because it does not move. Similarly, students might not consider seeds and eggs to be alive.

To access more in-depth science information in the form of text, diagrams and animations, refer to the Primary**Connections** Science Background Resource, now available on the Primary**Connections** website:

www.science.org.au/primaryconnections/science-background-resource

Note: This background information is intended for the teacher only.

Lesson 1 Handle with care

AT A GLANCE

To capture students' interest and find out what they think they know about how living things have basic needs, including food and water.

To elicit students' questions about the basic needs of animals, including humans.

Session 1 Our new friend

Students:

- discuss the care of the class pet
- contribute to a code of conduct for caring for the class pet
- record what they think they know about the needs of a pet and a person to stay alive.

Session 2 Meet my pet

Students:

- create drawings or use photographs to represent their pet
- observe the needs of their own pets in the home environment.

Lesson focus

The focus of the *Engage* phase is to spark students' interest, stimulate their curiosity, raise questions for inquiry and elicit their existing beliefs about the topic. These existing ideas can then be taken account of in future lessons.

Assessment focus



Diagnostic assessment is an important aspect of the *Engage* phase. In this lesson you will elicit what students already know and understand about:

- the basic needs of living things such as animals, for example food and water and observing, discussing, representing and sharing their ideas about these basic needs.

Key lesson outcomes

Science

Students will be able to represent their current understanding as they:

- observe the characteristics of the class pet
- identify the basic needs of the class pet
- represent the things an animal and humans need to stay alive.

Literacy

Students will be able to:

- contribute to discussions about the needs of an animal and humans
- record ideas using words, drawings or photographs.

This lesson also provides opportunities to monitor the development of students' general capabilities (highlighted through icons, see page 5).

Teacher background information

Animals, including humans, need oxygen to live. Land animals get oxygen from air. Aquatic animals use oxygen that is dissolved in the water they live in. Animals need a source of food. This provides them with energy and nutrients to maintain their bodies. This maintenance includes repairing and duplicating cells. Animals can get some water from their food but usually need to take in water separately if this is insufficient. Depending on the animal and the environment they live in, they might also need shelter. All animals need space in which to exist and grow. They also need room to move and an environment in which to find their sustenance.

Humans are classified by scientists as mammals, which are part of the animal kingdom. While there are differences between humans and other animals it is important to recognise that there are also many similarities.

Introducing a pet into the classroom

This unit requires the observation of animals. Each Australian state and territory has animal ethics requirements for school investigations involving vertebrate animals (those with a backbone, such as mice and rabbits). You will need to comply with any requirements of the relevant *Animal Welfare Act* if you choose to have a vertebrate animal as a class pet.

Insects and crustaceans are invertebrate animals and are not covered by the *Animal Welfare Act* but still require care and consideration.



Some students might suffer from allergies to certain animals. Check students' health records before choosing a pet to bring into the classroom.

Session 1 Our new friend

Equipment

FOR THE CLASS

- class science journal
- word wall
- Information wall (see 'Preparation')
- 1 class pet
- 1 'Pet and person' table (see 'Preparation')
- 1 enlarged copy of 'Circles about me' (Resource sheet 1)
- Pet care roster
- *Optional:* magazines

FOR EACH STUDENT

- science journal
- 1 copy of 'Circles about me' (Resource sheet 1)

Preparation

- Read 'How to use a science journal' (Appendix 2).
- Read 'How to use a word wall' (Appendix 3).
- Set up an information wall. This area will be used throughout the unit to collect and display information. Include space for photos and drawings of each student's own pet.
- Organise a classroom pet that can be kept in the classroom for the duration of the unit. The pet is compared to the students throughout the unit and is observed as part of the investigation in the *Elaborate* phase. Examples of suitable pets include a guinea pig, mouse, bird or rabbit, as these animals drink a noticeable amount of water in a day.
- Prepare an enlarged copy of 'Circles about me' (Resource sheet 1).
- *Optional:* Display 'Circles about me' (Resource sheet 1), the class science journal, the word wall and the information wall on an interactive whiteboard or a computer connected to a projector. Check the Primary**Connections** website to see if an accompanying interactive resource has been developed:
www.science.org.au/primaryconnections
- Prepare a code of conduct for working with animals. For example:
 - look, don't touch
 - leave the pet if it is sleeping
 - wash your hands before and after touching the pet
 - be gentle with the pet.
- Prepare a pet care roster for tasks such as refilling the pet's water, refilling the pet's food and cleaning the pet's shelter. Ensure all students are involved in caring for the class pet.

- Construct a 'Pet and person' table on a large sheet of paper or cardboard with the title, 'What do you think they need to stay alive?'. Draw up the table so that it has two columns with the headings 'Pet' and 'Person'. Make the table large enough so that new ideas can be added throughout the unit. Wherever possible, use pictures to illustrate text to support literacy learning. This table will be displayed on the information wall and used throughout the unit to record new information.
- Check resources needed throughout the unit and plan their preparation.

Lesson steps

- 1 Introduce the pet to the class and allow time for students to interact with the pet. Advise the class they will be learning about living things this term. The pet will be joining the class for the unit and they will be looking after it.



- 2 Ask students to suggest ideas about how the class will take care of the pet in the classroom. Ask questions such as:
 - What will we keep the pet in?
 - Where will we put the pet in our classroom?
 - What will the pet need while it's in our classroom?
 - What kind of food will we feed it?
 - How will we care for the pet over the weekend?

Introduce and discuss the code of conduct for working with animals to students and add additional student suggestions to it. Support the text with pictures where possible.



- 3 Introduce the 'Pet and person' table. Discuss the purpose and features of a table.

Literacy focus

Why do we use a table?

We use a **table** to organise information so that we can understand it more easily.

What does a table include?





A **table** includes a title, columns with headings and information organised under each heading.



- 4 Ask students what they think the pet needs to stay alive. Record answers on the table under the 'Pet' heading.

Draw students' attention to the heading in the second column. Ask students what they think they know about the needs of a person to stay alive. Record answers on the class chart under the 'Person' heading.

Note: In the *Engage* phase, do not provide any formal definitions or correct students' answers as the purpose is to elicit students' prior knowledge.

What do they need to stay alive?	
Pet	Person
<p>water</p>  <p>food</p> 	<p>food</p>  <p>a house</p> 

Sample 'Pet and person' table

- 5 Introduce the class science journal and discuss its purpose and features.

Literacy focus

Why do we use a science journal?

We use a **science journal** to record what we see, hear, feel and think so that we can look at it later.

What does a science journal include?

A **science journal** might include written text, drawings, labelled diagrams, photographs, tables and graphs.

- 6 Introduce 'Circles about me' (Resource sheet 1). Discuss the purpose and features of an ideas map.

Literacy focus

Why do we use an ideas map?

We use an **ideas map** to show our thoughts about a topic.

What does an ideas map include?

An **ideas map** includes a title in the centre. Ideas are written around it and arrows are drawn between similar ideas. An **ideas map** might include pictures and symbols.

- 7 Explain that students will be creating an ideas map of what they think they need to stay alive. Using the enlarged copy of 'Circles about me' (Resource sheet 1), model an ideas map in the class science journal. For example, use a drawing of yourself in the square. You might draw a picture of an apple in one circle and a bottle of water in another.



- 8 Ask students to draw a picture of themselves in the square in the centre of 'Circles about me' (Resource sheet 1). Ask students to write and draw things in the circles that they think they need to stay alive.



9 Lead a discussion about what people need to survive asking questions such as:

- What do you need to stay alive?
- Why do you think you need those things?
- What do you think would happen if you didn't have those things?
- Is there anything else you think you need to stay alive?
- How do you keep safe?

Ask students to paste the completed 'Circles about me' (Resource sheet 1) into their science journal. The ideas map is an opportunity for diagnostic assessment and will be referred to at the end of the unit.

10 Introduce the word wall and the information wall and discuss their purpose and features.

Literacy focus

Why do we use a word wall?

We use a **word wall** to record words we know or learn about a topic. We display the **word wall** in the classroom so that we can look up words we are learning about and see how they are spelt.

What does a word wall include?

A **word wall** might include a topic title or picture and words which we have seen or heard about the topic.

Explain to students that throughout the unit, new words will be added to the word wall and information about the class pet and pets at home can be added to the information wall.

Note: For Foundation Year students it is important to include images on the word wall to support literacy learning and the acquisition of new vocabulary.

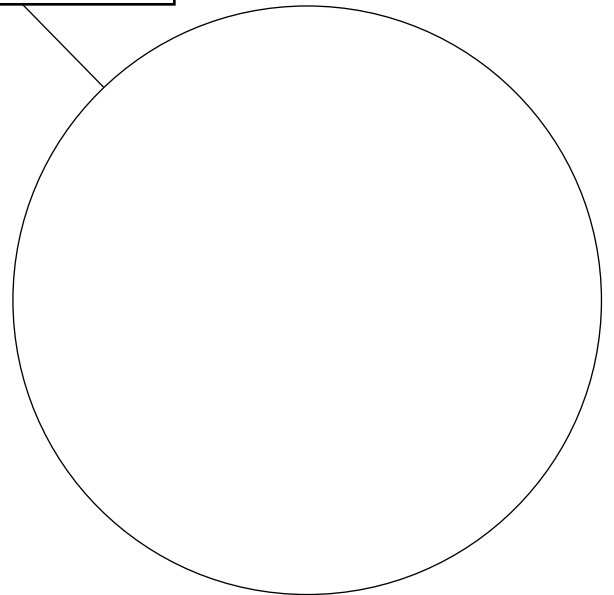
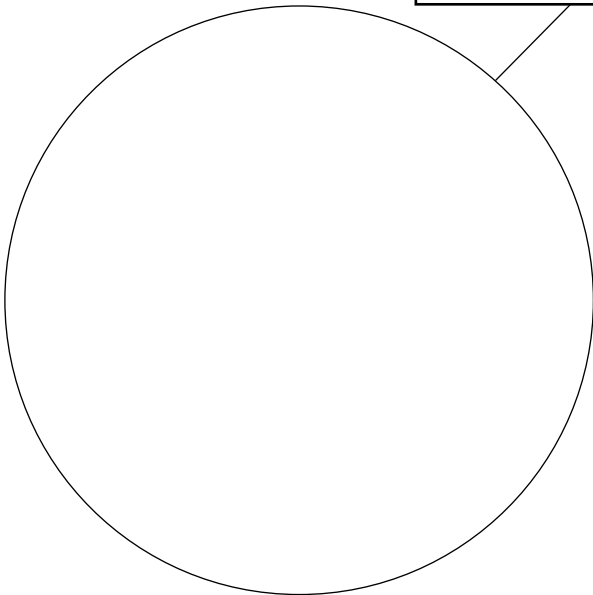
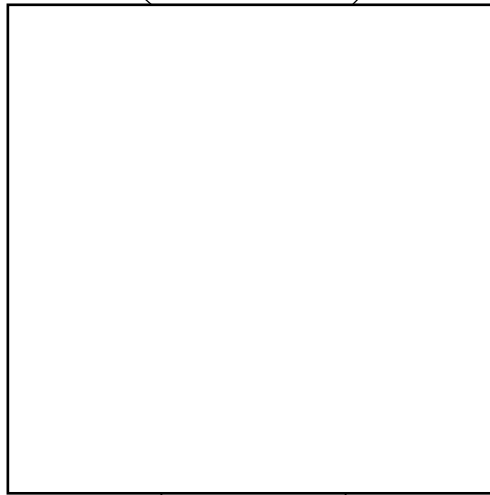
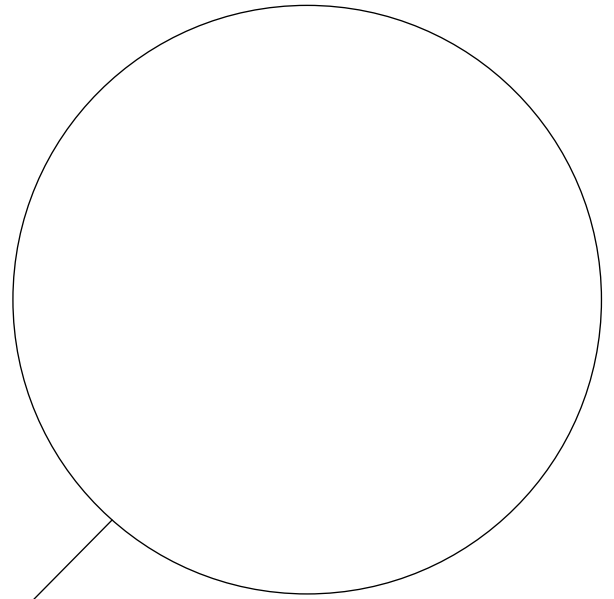
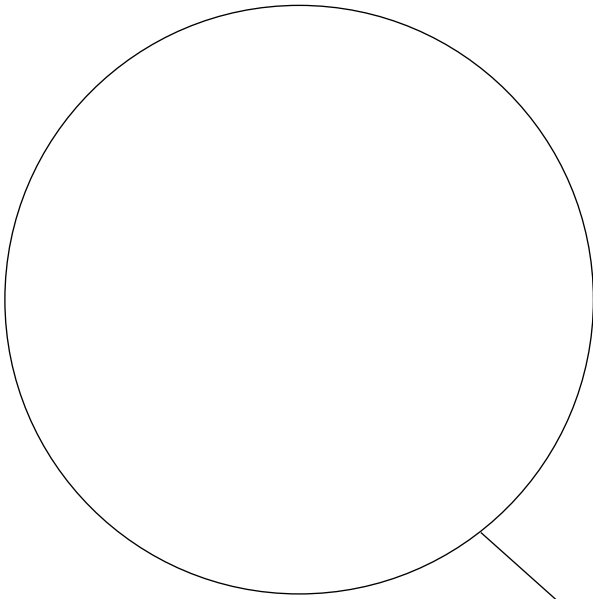
11 Display the 'Pet and person' table on the information wall. Update the word wall and information wall with new words and images.



12 Introduce a pet care roster so that all students are involved in the care of the class pet (see 'Preparation'). Remind students of the student code of conduct developed in Lesson step 2.

Circles about me

Name: _____ Date: _____



Session 2 Meet my pet

Equipment

FOR THE CLASS

- class science journal
- information wall (see 'Preparation')
- photo of your pet

FOR EACH STUDENT



- 'All about my pet' booklet
- 1 copy of 'Information note for families' (Resource sheet 2)

Preparation

- Make an 'All about my pet' booklet for each student. It should include a title page and at least four blank pages.
- Photograph your pet. If you do not have a pet, use a photo of another staff member's pet.
- Organise a time for students to present their observations of their pet to the class.

Lesson steps

- 1 Show students a photo of the pet you have at home or another staff member's pet. Describe the pet. Talk about its features, where it lives and what it does.
- 2 Ask students to share information about pets they might have at home.

Note: Be sensitive to students who do not have pets at home or those who have lost a pet. They could describe a pet that a family member or neighbour has instead.
- 3 Introduce the 'All about my pet' booklet prepared for each student.
- 4 Discuss how students will make observations of their pet at home. Discuss how students will use drawings and words to record their observations and information about their pet (or that of a family member or neighbour) in their booklet.
- 5 Provide each student with a copy of the 'Information note for families' (Resource sheet 2) to take home with their 'All about my pet' booklet. Read and discuss the information note with students.
- 6 Show students the space on the information wall for drawings or photographs of pets. Encourage students to bring in photos or drawings of their pet to display on the information wall. Display the picture of your (or another staff member's) pet on the information wall.
- 7   Arrange a time for each student to make an oral presentation about their observations of their pet. This could be done during 'News' or 'Show and tell' time or with another class.

Curriculum links

English

- Share written or oral description of pets with fellow students.

Mathematics

- Explore using hands and feet as informal units of measurement, for example, the height of horses.
- Ask students to draw a picture of their pet on a self-adhesive note. Construct a class column graph or affinity diagram to represent different groupings of pets, such as no legs, two legs, four legs or feathers, fur or fins.

The Arts

- Draw self-portraits using a mirror.

Information note for families

Name: _____ Date: _____

Introducing 'All about my pet' task

This term, our class will be exploring the needs of living things as part of the *Staying alive* unit. As part of this unit we would like to learn about the pets that students have at home.

If you do not have a pet at home, your child might be able to observe a relative's or a friend's pet.



Tasks to do

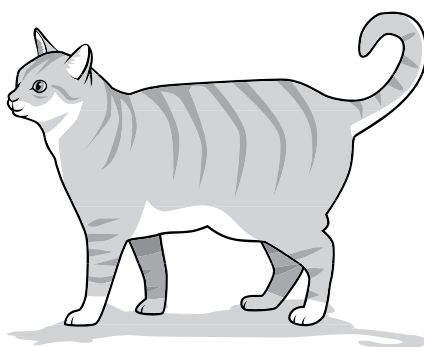
Each student has an 'All about my pet' booklet to record information about their pet such as:

- drawings of their pet
- where and when the pet sleeps
- how the pet interacts with other members of the family
- who looks after the pet
- what the pet eats and drinks
- unusual habits of the pet.

If possible, please send in photographs of the pet including its space for feeding and rest. These will be used for a classroom display during the unit.

Students will be asked to share their observations with the class on _____.

Class teacher



Lesson 2 Stretch your senses

AT A GLANCE

To provide students with hands-on, shared experiences of the senses and how senses help animals, including humans, survive in their environment.

Session 1 Sorting our senses

Students:

- use their senses to describe a mystery object
- identify the body parts associated with the different senses
- use a question chart to record descriptions of sensory experiences.

Session 2 Senses detectives

Students:

- use senses to make decisions about different situations they may encounter in their everyday life
- record observations in a class table.

EXPLORE

Lesson focus

The *Explore* phase is designed to provide students with hands-on experiences of the science phenomenon. Students explore ideas, collect evidence, discuss their observations and keep records, such as science journal entries. The *Explore* phase ensures all students have a shared experience that can be discussed and explained in the *Explain* phase.

Assessment focus



Formative assessment is an ongoing aspect of the *Explore* phase. It involves monitoring students' developing understanding and giving feedback that extends their learning.

In this lesson you will monitor students' developing understanding of:

- how animals use their senses to help ensure their basic needs are met, responding to questions, exploring and observing the world using their senses. You will also monitor their developing science inquiry skills (see page 2).

Key lesson outcomes

Science

Students will be able to:

- identify the senses of touch, hearing, smell, sight and taste
- identify the body parts associated with the senses
- recognise how the senses help us make decisions about unsafe situations.

Literacy

Students will be able to:

- participate in discussions about the senses
- contribute ideas to a question chart
- identify the broad purposes and features of a table.

This lesson also provides opportunities to monitor the development of students' general capabilities (highlighted through icons, see page 5).

Teacher background information

All organisms gather information about their environment to identify hazards and essential nutrients. Although plants cannot move to escape danger or source nutrients, even the simplest animals will move towards a food source and away from something dangerous. Mammals such as humans have complicated sensory organs to receive information about the environment:

- Eyes detect visible light waves bouncing off objects. The brain processes the information to see where the object is in relation to the eye, and whether it can identify it. Animals use sight to find food and water and identify kin and foe. They can also recognise visual clues as signs of danger, for example, kangaroos are afraid of the colour orange because it is the colour of fire.
- Ears channel sound vibrations. The brain processes the signals from each ear to work out where the sound is coming from and attempts to identify the source of the sounds. The sound of a bird calling might indicate a food source to a predator. The sound of a hooting call might indicate a barn owl's presence to mice.
- Noses detect chemicals in the air and this helps us identify food or indicate whether something is safe to eat, for example, rotten meat smells bad. Smell can also alert us to danger, for example, we can smell smoke. Smell informs animals about the presence of other animals. Predators stay downwind of their prey and moths secrete airborne chemicals to attract their mates.

It is commonly accepted that there are five senses; however in reality it is much more complicated. For example, human skin has different sensors for heat, pressure, vibrations and pain, including itching and tickling, however, all of these sensations are grouped within the sensory term 'touch'.

Different animals have different sensory systems. Some have sensory organs that are more or less developed than in humans and others have sensory organs in different parts of their bodies. For example, dogs have very sensitive noses, snakes 'smell' using their tongues, and scorpions analyse vibrations in the air and soil to determine the location of other animals nearby.

Some animals have sense organs which perceive signals in the environment that humans cannot detect without the use of machines. For example, sharks and platypi can detect weak currents of electricity in water, which are generated by the nervous systems of their prey. Bats use echolocation to navigate using ultrasound reflection and bees use ultraviolet light radiation to see.

Students' conceptions

Young students can think concretely about individual organisms (living things). However, the concept that organisms depend on their environment is not well developed.

Students might believe that our senses provide us with a complete representation of the environment. However, our senses are limited in scope. Other animals, as well as scientific instruments, can detect sounds and light beyond the range of our senses. For example, dogs can hear sounds with a frequency around three times higher than what humans can hear. The sensitivity of different sensory organs also varies between people and our senses can be deceived or distorted in various circumstances.

Session 1 Sorting our senses

Equipment

FOR THE CLASS

- class science journal
- word wall
- information wall
- 1 opaque container (eg, a box or brown paper bag)
- a selection of mystery objects (see 'Preparation')
- a class mystery object (eg, a flower, seeds, leaf, piece of fruit)
- *Optional:* 4 blindfolds

Preparation

- Prepare an opaque container as the 'Mystery container'.
- Prepare a selection of mystery objects, such as a carrot, a piece of bread, a cracker, a marshmallow, a sugar cube or a date. There should be one object for each group of four students.
- If necessary, break each item into smaller pieces to disguise the shape. Place all the mystery objects in the 'Mystery container' so students cannot see them.
- Be aware of students with allergies. Students will not be tasting the items but may suffer from allergies caused by inhalation or touch.
- Decide how the students will be divided into groups, such as by eye colour, hair colour or counting. Depending on class numbers, some students might need to have two turns so that all groups have four members.



- Prepare a 'My five senses' question chart in the class science journal as follows:




Sample 'My five senses' question chart

- Leave enough space to write students' observations in each box.

Lesson steps



- 1 Ask students who have been looking after the class pet since the previous science lesson to share observations they have made about the pet, with the class. Review the previous lesson, including the word wall and information wall. Ask students to recall ideas about what they think pets and people need to stay alive and what new things they learned.
- 2 Organise students to form groups based on the method chosen in 'Preparation'. Ask students to sit with their group in a class circle. Introduce the 'Mystery container'. Explain that it has mystery objects inside and that the students will close their eyes and try to work out what the mystery objects are. Explain that each group of four will have a different mystery object to identify. Explain that group members and other class members must not call out the name of the object.
- 3 Ask the first four students to stand up and close their eyes. Place the mystery object in the first group member's hands. Remind students in the group not to look at the object.
Optional: Blindfold each group member for Lesson steps 3 to 8.
- 4 Ask the first student to describe to the class what the object feels like, then pass it to the next student.
- 5 Ask the second student to describe to the class what the object sounds like when it is near their ear. It might be necessary to break or rub the object when it is near their ear. When the student has described the object, pass it to the next student.
- 6 Ask the third student to describe to the class what the object smells like, then pass it to the next student.

- 7 While the rest of the group has their eyes closed, ask the fourth student to open his or her eyes and describe what the object looks like without identifying it by name.
-  8 Ask the three other group members to try to guess what the object is before opening their eyes.
- 9 Repeat Lesson steps 3 to 8 with each group of four students around the circle using a different mystery object each time.
- 10 Ask students if they know a word that can be used for the different ways they observed the mystery objects. Ask them if they know what the word 'sense' means. Explain that a sense is our body's way of finding out about different things in our environment and that we have five senses. Ask students to recall what senses and body parts they used to identify the mystery objects.
-  SAFETY 11 Ask students which sense was not used. Ask students why they didn't taste the object and why they shouldn't put things in their mouths and taste things if they don't know what they are.
-  12 Introduce the 'My five senses' question chart in the class science journal. Show students the class mystery object (flower, seeds, leaf, piece of fruit). Encourage students to describe the object using the five senses. Record the students' observations on the 'My five senses' question chart. For the taste sense, ask students to describe what the object might taste like, based on previous experiences.
- 13 Update the word wall and information wall with words and images.

Session 2 Senses detectives

Equipment

FOR THE CLASS






- class science journal
- word wall
- information wall
- display pictures of a busy road (see 'Preparation')
- whistle
- 2 buckets of water (see 'Preparation')
- 2 margarine containers with lids
- 1 red self-adhesive dot
- 1 blue self-adhesive dot
- 8 cotton wool balls
- vanilla essence
- eucalyptus oil

Preparation

- Find or prepare two photos for Lesson step 5 (for example, on the PrimaryConnections website www.science.org.au/primaryconnections): one picture of a busy road with no crossings or traffic lights and a second picture of a busy road with a crossing and traffic lights or children's crossing flags.

- Organise a poem or passage of text to read for Lesson step 6.
- Fill two buckets with water—one with warm water and one with icy cold water.
- Soak four cotton wool balls in eucalyptus oil and place in a margarine container. Soak another four cotton wool balls in vanilla essence and place in a separate margarine container. Put lids on each container. Differentiate the containers by putting a red self-adhesive dot on one and a blue self-adhesive dot on the other.
- Prepare a ‘Senses alert’ (Resource sheet 3) table in the class science journal as follows:

Senses alert

				
touch	hearing	smell	sight	taste

Lesson steps

- 1 Ask students who have been looking after the class pet since the previous science lesson to share observations they have made about the pet with the class. Review the five senses as discussed in the previous session. Ask students to recall ideas about how the class pet uses its senses. Read over the ‘My five senses’ table and remind students of the danger of tasting and touching things they are unsure of.



- 2 Introduce the ‘Senses alert’ table. Ask students to recall which body part is used for each of the senses.

- 3 Ask students for ideas about how our senses help to alert us to danger in our environment. Ask questions such as, ‘What dangers do our nose, ears, eyes and bodies tell us about?’. Record suggestions on the ‘Senses alert’ table in the appropriate box. For example:

- we feel something hot or sharp
- we hear a loud siren
- we smell smoke
- we see a red light or a red flag
- we taste something bitter.

Discuss with students how our senses help to alert us to danger in our school environment. Ask questions such as ‘How do we know when we have to leave the building?’.



Explain to students that they will now practise making safe decisions using their senses.

- 4 Display a picture of a busy road with no pedestrian crossing or traffic lights (see 'Preparation'). Ask students to observe and describe what is happening in the picture. Display a picture of a similar road with traffic lights and a pedestrian crossing. Ask students to observe and describe what is happening in the picture. Ask students to decide which road they would cross and why.



- 5 Discuss how the sense of sight helps us to find out about our environment. Ask students if they have any ideas how people with vision impairment interact with the environment. Add any new information about sight to the 'Senses alert' table.
- 6 Tell students that they are about to hear some sounds. Explain that some of the sounds will be loud and some will be soft. Blow a loud whistle and ask students how that sound made them feel. Read a passage of text in a quiet, calm voice and ask students how that sound made them feel. Ask students questions such as

- How were the sounds different?
- Where might we hear these sounds?
- What might these and other sounds tell us about our environment?



- 7 Discuss how the sense of hearing helps us to find out about our environment. Ask students if they have any ideas how people with hearing impairment interact with the environment. Add any new information about hearing to the 'Senses alert' table.
- 8 Show students the two buckets of water. Explain that there is water in the buckets and that it is safe for students to touch. Ask students to place their hand gently into each bucket and then decide which one they would prefer to swim in. Ask students to give reasons for their decisions.



- 9 Discuss how the sense of touch helps us to find out about our environment. Ask students for examples of other ways our sense of touch helps to keep us safe. Add any new information about touch to the 'Senses alert' table.
- 10 Show students two margarine containers with scented cotton wool balls in each. Explain to students that you have prepared these for the activity and that they are safe to smell. Pass the first container around for students to smell. Ask students to describe the smell. Repeat with the second container. Ask students if they liked or disliked either of the smells and share their reasons why.



SAFETY

Be aware of students with allergies. Students may suffer from allergies caused by inhalation and touch.



- 11 Discuss how the sense of smell helps us to find out about our environment. Ask students for ideas about how the sense of smell keeps us safe. Add any new information about smell to the 'Senses alert' table.
- 12 Ask students how the sense of taste helps to keep us safe. For example, we know not to drink the water in the ocean because it is salty. Add any new information about taste to the 'Senses alert' table.



- 13 Discuss with students what they now know about senses. Ask students to suggest ways that our senses help us gather information about our environment and help us to keep safe. Record these suggestions in the class science journal.



- 14 Relate the idea of using senses of touch, hearing, smell, sight and taste to the class pet. Ask students for ideas about how the pet uses its senses.

- 15 Update the word wall and information wall with words and images.

Optional: Go for a 'Senses alert' walk around the school environment. Discuss how our senses help us in the school environment. For example:

- we can hear the teacher blow the whistle at the end of the game
- we can see the flags at the school crossing
- we can smell the mouldy fruit in our lunchbox.

Add any new information about how our senses help to keep us safe to the 'Senses alert' table.

Curriculum links

English

- Practise using verbal instructions. Choose a trail in the school yard/garden and divide the class into pairs. One member of the pair wears a blindfold while the other uses verbal instructions to guide their partner along the trail.
- Share poems about smells, tastes, sounds and sights and use onomatopoeia to explore interesting and descriptive vocabulary.

Studies of society and environment

- Explore how people with sensory impairment interact with the world, such as the use of Braille and sign language.

The Arts

- Have students create a class comparison chart of quiet and noisy things, or warm/hot and cool things, using student drawn pictures or pictures from magazines.
- Make a tactile chart with items such as pieces of material, corrugated cardboard and sandpaper.



Indigenous perspectives

- Contact local Indigenous community members and/or Indigenous education officers and invite them to speak with the students about bush foods from the local area.
- Read *Ernie dances to the didgeridoo* or *When I was little, like you*. Discuss how the children are collecting and preparing food themselves and not relying on adults or going to the shop.

(Lester, A. (2000). *Ernie dances to the didgeridoo*. Sydney: Hodder Children's Book.)

(Malbunka, M. (2003) *When I was little, like you*. Sydney: Allen & Unwin.)

Senses alert



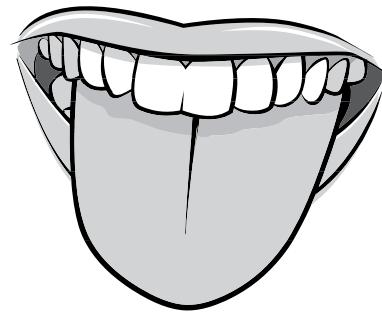
touch



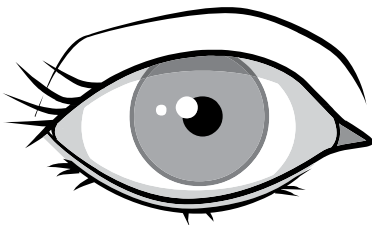
smell



hearing



taste



sight

Lesson 3 Move it!

AT A GLANCE

To provide hands-on, shared experiences to explore how animals, including humans, need air, food and water.

Session 1 Chomp, chomp!

Students:

- discuss food and what makes them hungry
- record what food they eat during a day.

Session 2 Huff and puff

Students:

- explore how their breathing changes after high-level physical activity
- explore other changes to their body after high-level physical activity.

Session 3 Slurp and see

Students:

- discuss why we need to drink water
- discuss what happens to our bodies when we drink water.

Lesson focus

The *Explore* phase is designed to provide students with hands-on experiences of the science phenomenon. Students explore ideas, collect evidence, discuss their observations and keep records such as science journal entries. The *Explore* phase ensures all students have a shared experience that can be discussed and explained in the *Explain* phase.

Assessment focus



Formative assessment is an ongoing aspect of the *Explore* phase. It involves monitoring students' developing understanding and giving feedback that extends their learning. It involves monitoring students' developing understanding of:

- how living things such as animals have basic needs including air, food and water, responding to questions, exploring and observing their needs over the course of the day. You will also monitor their developing science inquiry skills (see page 2).

Key lesson outcomes

Science

Students will be able to:

- identify air, food and water as basic needs of animals and humans
- recall and record food intake during a day
- compare what happens to our bodies before and after high-level physical activity
- describe why we need water in our bodies.

Literacy

Students will be able to:

- contribute to discussions about basic needs of pets and people
- contribute to a T-chart about the needs of pets and people
- create a storyboard describing what happens to our bodies after high-level physical activity.

This lesson also provides opportunities to monitor the development of students' general capabilities (highlighted through icons, see page 5).

Teacher background information

Animals need energy to live. To obtain this energy, animals, including humans, can eat plants. Plants store energy from the Sun by creating complex molecules, such as sugars. This process is called photosynthesis. Animals need oxygen to break down the complex molecules and access the stored energy.

Animals also need certain nutrients to build and maintain their bodies, including minerals, carbohydrates, fats, proteins and water. Humans, for example, need to eat protein to help build cells such as muscle cells.

Land-based animals breathe in air to dissolve oxygen into their blood stream. Breathing also allows animals to expel carbon dioxide, which is produced when sugars are broken down. When carbon dioxide becomes concentrated in the bloodstream it can damage cells. Aquatic animals, such as fish, can access oxygen dissolved in the water around them and release carbon dioxide back into it. Goldfish can be seen pumping new water into its gills, which is the equivalent of breathing.

During physical exercise lots of complex molecules, such as sugars, are broken down because movement requires a lot of energy. This causes an increased demand for oxygen as well as an increased need to expel carbon dioxide. Heart rate increases to speed up the delivery of oxygen in the bloodstream to the necessary parts of the body and to remove carbon dioxide faster. As the energy is accessed, some is used by the body and some is transformed into heat energy, which is why exercise warms the body.

Water has many different properties that make it essential to life:

- Many things will dissolve in water, making it a good solvent. Therefore it can be used to carry substances around the body and to take toxins away, for example, in urine.

- Water is an essential part of many chemical reactions that cells of different organisms carry out to maintain life.
- When water evaporates it cools the surface from which it evaporates. Some animals sweat in order to cool down. Panting or a wet nose achieves the same effect of cooling an over-heated animal.

Animals need to eat in order to gain the energy they need to survive. Animals also rely on their food to provide essential nutrients. For example, mammals need to ingest calcium in order to be able to build bones. Certain minerals, such as salt, are necessary to the body but can cause problems if too much is eaten. Understanding the nutritional needs of humans is the basis of food science.

Animals also need to move to keep their bodies healthy. Bones will weaken and muscles will deteriorate if not used. If an animal continues to eat but does not move much, the energy from the food might be converted into fat deposits on the animal's body. Most animals move to find food and avoid dangers. Many humans will move specifically to exercise their bodies for health reasons and to avoid fat deposits.

Students' conceptions

Many students do not have an accurate understanding of the internal structure of the human body. They might think that food and drink go to different places in the body, or that there is just one cavity inside the body, where food, water and air are stored. Most students will not be familiar with blood vessels and the role blood plays in our bodies. Some students think that the air we inhale simply comes back out of our bodies unchanged, or that it goes to the same place food goes.

Students might have difficulty understanding the role food plays in the body. They might not connect the intake of food to their growth and wellbeing, as they would be unaware that some chemicals in food are used to build and repair cells. Other chemicals are broken down to release stored energy to be used for physiological processes.

Students might believe that an organism grows because its cells increase in size.

Organisms get larger because their cells reproduce, so while the cells are still roughly the same size, there are more of them. Cells need various nutrients and energy to reproduce and stay healthy.

Because humans cannot breathe under water, students might not think that aquatic animals need oxygen. However, they still need oxygen to release energy from their food. Aquatic mammals such as dolphins and whales obtain oxygen from the air in the same way that humans do. Fish can access oxygen dissolved in water using their gills.

Session 1 Chomp, chomp!

Equipment

FOR THE CLASS

- class science journal
- word wall
- information wall
- 'Pet and person' table
- T-chart (see 'Preparation')

FOR EACH STUDENT

- 2 self-adhesive notes

Preparation

- Prepare a T-chart in the class science journal with the title 'Class pet eats ...' in the first column and the title 'People eat ...' in the second column.

Lesson steps

- 1 Ask students who have been looking after the class pet since the previous science lesson to share observations they have made about the pet with the class. Review the basic needs listed on the 'Pet and person' table from Lesson 1. Ask students to recall what they have learned about what pets and people need to stay alive.
- 2 Discuss with students other things that animals, including humans, might need to stay alive.

Assist students in exploring what they need, by asking them about things they do everyday:

- When you get up in the morning, what do you do?
- Do you eat breakfast?
- Do you have a drink?
- Do you yawn?

Record students' ideas in the class science journal.



- 3 Introduce the T-chart and discuss its purpose and features.

Literacy focus**Why do we use a T-chart?**





We use a **T-chart** to organise information so that we can understand it more easily.

What does a T-chart include?

A **T-chart** includes two columns with headings. Information is put into the columns based on the headings.

Explain that the first column of the T-chart is about what the class pet eats and the second column is about what people eat.

- 4 Ask students to draw, on a self-adhesive note, what the class pet might eat, and display in the first column of the T-chart.
- 5 Ask students to think about what they have eaten during the day and to draw one of these types of food on another self-adhesive note. Collect the notes and display in the second column of the T-chart.

Rabbits eat...	People eat...
carrot  lettuce 	chicken  watermelon 

Sample T-chart



- 6 Ask students to think about being hungry. Ask questions such as:
 - How do you know that you are hungry?
 - How do you feel when you eat something?
 - Why do you think we get hungry? (Our bodies need food for energy and to keep healthy.)

Record answers in the class science journal.

Note: Be sensitive to students' personal experiences when facilitating this lesson.



- 7 Compare the food needs of the student with the food needs of the class pet, by reviewing the 'Pet and person' table. Add any new information that students have learned.

-  **8** Ask students what they have noticed about the amount of food the class pet eats compared to how much food they eat. Ask questions such as:
- Do you eat more or less food than the class pet?
 - Why do you think you need to eat more or less food than the class pet? (Bigger animals need more energy for movement and more nutrients for their bodies.)
-  **9** Ask students questions about how food helps to keep us alive. Record students' ideas in the class science journal under the question 'Why do we need to eat?'.
- 10** Update the word wall and information wall with words and images.

Session 2 Huff and puff

Equipment

FOR THE CLASS

- class science journal
- word wall
- information wall
- physical activities and games
- 1 enlarged copy of 'Puff piece' (Resource sheet 4)
- *Optional:* stop watch

FOR EACH STUDENT

- science journal
- 1 copy of 'Puff piece' (Resource sheet 4)

Preparation



- Organise a variety of physical activities and games to include running, jumping and skipping, such as star jumps, running on the spot or leap frog.



SAFETY

- Students will be required to engage in high-level physical activity in this session. Check student health records and consider the health and well-being of students before asking them to participate.
- Prepare an enlarged copy of 'Puff piece' (Resource sheet 4) and paste into the class science journal.
- *Optional:* Display 'Puff piece' (Resource sheet 4) on an interactive whiteboard or a computer connected to a projector. Check the Primary**Connections** website to see if an accompanying interactive resource has been developed:
www.science.org.au/primaryconnections

Lesson steps

- 1 Ask students who have been looking after the class pet since the previous science session to share observations they have made about the pet, with the class. Ask students about how much food the pet has eaten since the previous session. Review the previous session, including the word wall and information wall. Ask questions such as:

- Why do we need to eat? (Our bodies need food for energy and to stay healthy.)
- How do we know when we need to eat?
- Do we need anything else apart from food to stay alive? (Water, air and shelter.)

- 2 Organise students to move to an outdoor area or a large open indoor space. Ask students to stand at approximately arm's distance apart. Ask students to close their eyes, stand still and to listen to their breathing.



- 3 Ask students to put their hands on their rib cage to observe their breathing by feeling their ribs rising and falling. Discuss with students what they notice about their breathing. Ask questions such as:

- Is it slow?
- Is it fast?
- Does it feel easy to breathe?

Note: It is a requirement in some states and territories that students drink water before participating in high-level physical activity. Consider the climate and conditions before engaging students in this activity

- 4 Introduce students to the **Predict, Observe, Explain (POE)** strategy. Explain to students that they are going to consider what might happen to their breathing after they participate in a high-level physical activity, such as star jumps, running on the spot or leap frog.



Predict: Ask students to tell you what they think will happen to their bodies during the high-level physical activity and after the high level physical activity.

Observe: While students participate in the high level physical activity, they will observe what happens to their bodies. Once students have finished the physical activity, ask them to stand still again and observe their breathing by listening and feeling their rib cages.



Explain: Ask students to compare their predictions with their observations. Ask them to explain why they think their breathing rate increased after high-level physical activities.

- 5 Model the physical activity or ask a student to demonstrate. Challenge students to maintain the activity for a period of time.



Optional: Count the number of repetitions students can complete or use a stopwatch to time the activity.

- 6 After completing the high-level physical activity, allow time for students to observe their breathing. Ask questions such as:
- Is it slow?
 - Is it fast?
 - Is it harder to breathe than before? Why?
 - Are the breaths bigger or smaller? Why? (Our bodies need more oxygen when we move around quickly.)
- Encourage students to compare their predictions with their observations and explain any differences.
- 7 Repeat Lesson steps 5 and 6 with a different high-level physical activity.
- 8 Organise students to return to the classroom. Introduce 'Puff piece' (Resource sheet 4). Discuss the purpose and features of a storyboard.

Literacy focus

Why do we use a storyboard?

We use a **storyboard** to show important steps of a process in the order that they happen.

What does a storyboard include?

A **storyboard** includes a title. Each step in the **storyboard** is numbered and includes a picture and a caption describing the step.



Model creating a storyboard using the enlarged copy of 'Puff piece' (Resource sheet 4). Ask questions such as:

- What did we do first when we went outside?
- What did we think might happen to our bodies after high-level physical activity?
- What types of high level physical activity did we do?
- What happened to our bodies after high-level physical activity?









- 9 Ask students to complete 'Puff piece' (Resource sheet 4) by writing and drawing to show the sequence of events during the activity. Students should be able to represent:
- feeling their breathing at a normal rate and predicting what might happen to their breathing after physical activity
 - participating in physical activity
 - observing their breathing after physical activity
 - an explanation of what happened to their bodies after physical activity.

Ask students to paste 'Puff piece' (Resource sheet 4) into their science journals.

- 10 Discuss with students how their breathing rate increased after physical activity. Encourage students to suggest reasons why their breathing changed after physical activity. Ask students why we need air and why we need to breathe. Record students' ideas in the class science journal under the question 'Why do we need to breathe?'. Ask students if they think the class pet's breathing also changes after high-level physical activity.
- 11 Update the word wall and information wall with words and images.

Puff piece

Name: Aimee Date: 10th March

  I can feel my breathing and my heart. It is slow.	  I did some skipping.	  My breathing and my heart changed. It went faster. I felt a bit sweaty.
Before	During	After

Resource sheet 4

Sample 'Puff piece' (Resource sheet 4)

Session 3 Slurp and see

Equipment

FOR THE CLASS

- class science journal
- word wall
- information wall
- 'Pet and person' table
- physical activities and games

Preparation

- Organise a variety of physical activities and games to include running, jumping and skipping.



Students will be required to engage in physical activity in this session. Check student health records and consider the health and well-being of students before asking them to participate.

- Prepare two Y charts in the class science journal with one of the following labels in each section: 'Looks like ...', 'Feels like ...' and 'Sounds like ...'. Include the heading 'Before the activity' on one chart and 'After the activity' on the other.

Note: This session may be integrated with a Physical Education or Health activity or can be added to Session 2.

Note: It is a requirement in some states and territories that students drink water before participating in physical activity. Consider the climate and conditions before engaging students in this activity.

Lesson steps

- 1 Ask students who have been looking after the class pet since the previous science session to share observations they have made about the pet with the class.

Ask them if they have noticed the class pet breathing.

Review the previous session, including the word wall and information wall. Ask questions such as:

- What happened to our breathing after a higher level of physical activity?
- Why do you think this happened?
- Did you notice anything else that happened to your body?



- 2 Introduce students to the first Y chart in the class science journal. Ask students for ideas about how they look, feel and sound when they are sitting in class. Answers might include comfortable and quiet.

- 3 Organise a variety of physical activities including running, skipping and jumping so students can feel their bodies getting warmer and feel their breathing rate increase. Discuss what changes occurred after the physical activity. Students might mention that they felt tired, they needed a rest or they started to sweat.



- 4 Lead a discussion about perspiration, by asking the following questions:
 - Where do you think the water comes from? (The water that is stored in our bodies.)
 - Why would you sweat when you do physical activity? (The water is coming out of our bodies when we heat up to help our body cool down.)
 - What would happen if we had no water in our bodies? (Our bodies will not work properly.)



- 5 Take students back to the classroom and encourage them to have some water from a water bottle or a school drinking fountain. Ask how they feel after they drink water. Ask students why they think we need water and how it helps to replace the water our bodies lose through perspiration, tears, saliva and urine. Record students' ideas in the class science journal under the question, 'Why do we need water?'.



- 6 Introduce students to the second Y chart in the class science journal. Ask students for ideas about how they look, feel and sound after the high-level physical activity. Answers might include red-faced, sweaty and puffing. Compare the two Y charts and ask students for ideas about why they look, feel and sound different after high-level physical activity.



- 7 Ask students to compare the water, food and air needs of students with the water, food and air needs of the class pet. Review the 'Pet and person' table and add any new information.

- 8 Update the word wall and information wall with words and images

Curriculum link

Science

- Explore what the bilby needs to survive.



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The Le@rning Federation (www.thelearningfederation.edu.au)

The night of the Bilby: find food, Curriculum Corporation,
The Le@rning Federation learning object L896.

*Students identify factors that threaten the survival of bilbies.
Students identify features of an ecosystem that bilbies depend on
for their survival.*

Puff piece

Name: _____ Date: _____

Before	During	After

Lesson 4 Space and shelter

AT A GLANCE

To provide hands-on, shared experiences to explore how animals, including humans, need space and shelter.


Students:

- play games to experience competing with others for space
- explore an area with a lot of space
- discuss the protection and shelter provided by their home space
- compare their home space with the class pet's space.

Lesson focus

The *Explore* phase is designed to provide students with hands-on experiences of the science phenomenon. Students explore ideas, collect evidence, discuss their observations and keep records such as science journal entries. The *Explore* phase ensures all students have a shared experience that can be discussed and explained in the *Explain* phase.

Assessment focus

 **Formative assessment** is an ongoing aspect of the *Explore* phase. It involves monitoring students' developing understanding and giving feedback that extends their learning.

It involves monitoring students' developing understanding of:

- how living things such as animals have basic needs including space and shelter, responding to questions about and exploring their need for space and shelter. You will also monitor their developing science inquiry skills (see page 2).

This lesson also provides opportunities to monitor the development of students' general

Key lesson outcomes

Science

Students will be able to:

- observe the differences between a confined and an open space
- identify the basic need for shelter
- identify and observe how a home provides shelter and protection.

Literacy

Students will be able to:

- contribute ideas to a class discussion about shelter
- create a model of a safe place to play.

capabilities (highlighted through icons, see page 5).

Teacher background information

Animals need space and shelter. These needs are supplied by the environment, such as, a spider needs space in which to set up a web to catch prey and kangaroos need a certain amount of space in which to graze. A larger population of animals will need a larger area to live in. As populations grow through breeding, the animals will need more space in which to live and to supply sufficient food.

Some animals need shelter to hide from predators or to avoid extreme temperatures. Becoming too hot can be lethal. For example, small desert marsupials need a burrow to escape the heat of the Sun, so a shelter can be a basic requirement for survival.

Sleep is also essential for all animals. This is a vulnerable time for many animals, and they need protection. This protection might involve part of their body, for example, a turtle's shell, or involve finding a safe or sheltered place to sleep, for example, koalas sleep high up in tree branches.

Equipment

FOR THE CLASS

- class science journal
- word wall
- information wall
- 1 tin of sardines
- 1 large sheet of newspaper
- *Optional:* digital camera

FOR EACH STUDENT

- modelling materials (eg, straws, pop sticks, cardboard, plasticine)

Lesson steps

- 1 Ask students who have been looking after the class pet since the previous science lesson to share observations they have made about the pet, with the class. Ask how much water they had to add to the class pet's supply. Review the previous lesson, including the word wall and information wall. Encourage students to discuss how pets and people need food, air and water.



- 2 Introduce a tin of sardines and talk about its size. Explain to students that when people want to describe being squashed in a small space they sometimes use the saying 'packed in like sardines in a tin'.



Be aware of students with allergies. Students may suffer from allergies caused by inhalation or touch.



- 3 Open the tin and show the students how the sardines are tightly packed in the tin. Ask students to guess how many sardines are in the tin. Count the sardines together.



- 4 Spread the sheet of newspaper on the floor. Ask students to predict how many students could fit on the piece of paper. Challenge students to fit as many of them

standing on the paper as possible. Provide opportunities for all students to participate in order to experience being crowded.



5 Discuss how it felt to be crowded onto the newspaper. Ask questions such as:

- Did you feel comfortable on the newspaper?
- Would you like to stay like that for a long period of time?
- Was there enough room for eating or drinking on the newspaper?



6 Ask students to recount times when they have experienced being crowded in a space with a lot of other people. Suggestions could include lining up at school, going to the show, travelling on buses or trams, shopping before Christmas or queuing at a sporting venue. Ask questions such as:

- How did you feel?
- What could you see when you were crowded?
- Were you comfortable in that space?
- What happened to your body when you were crowded? (I couldn't breathe, I couldn't see, I couldn't move, I got hot.)



7 Organise students to move to a place in the school that has a lot of space (assembly area or playground) and explore the movements they can make in that area, such as jumping, stretching and tumbling. Ask questions such as:

- How did you feel?
- Did this activity make you feel uncomfortable?
- What could you do here that you couldn't do when you were crowded on the newspaper?
- What do you think would happen to your body if you didn't have enough space to move in?



8 Organise students to return to the classroom. Ask the students to reflect on their homes as a safe place that gives shelter and protection from the weather. Ask questions such as:

- What would happen if we didn't have a home to provide shelter for us?
- What if we put our bed outside in winter or in the Wet season?
- What if it was too noisy?
- What if there was no roof on our house and it rained?
- What if all of the students at school came into our classroom?

Note: Be sensitive to students' personal experiences when facilitating this lesson.



9 Ask students to compare their own home space with the space allocated to the class pet.

Optional: Ask students to record their observations in their science journal.



10 Discuss the need to have space and shelter that gives us protection, focusing on play areas that are safe. Ask students to describe what safe play areas look like, sound like and feel like. Record students' ideas in the class science journal.



11 Demonstrate creating a model of a safe place to play using materials such as straws, plasticine and cardboard. Ask students to create their own model of a safe place to play and explain their representation.

Optional: Use a camera to take photographs of students' models and add them to the class science journal.

- 12 Update the word wall and information wall with words and images.

Curriculum links

English

- Read stories about animals and their homes.

Mathematics

- Compare the size of each student's home space to their pet's space.

Studies of society and environment

- Discuss examples of housed and shelters in different parts of the world. Discuss how needs vary and impact on design.
- Explore animal shelters in zoos, on farms and in the wild.



Indigenous perspectives

- Traditional Indigenous shelters varied in their style and construction to suit the environmental conditions. Short-term shelters might be simple windbreaks built from bark whereas a longer term family house might be more substantial, including thatched grass.
- Invite members of the local Indigenous community and/or Indigenous education officers to share their knowledge of shelters with students. Build a full-size or scale model of an Indigenous shelter. See www.det.wa.gov.au/education/abled/apaclessons/pdfs/apac106.pdf



Students building a mia mia

Discuss the environmental conditions that made these shelters necessary.

Lesson 5 Take it or leave it

AT A GLANCE

To support students to represent and explain their understanding about the basic needs of animals, including humans, and to introduce current scientific views.

Students:

- record ideas about the basic needs of animals, including humans
- describe and sort items needed for a camping trip.

Lesson focus

In the *Explain* phase students develop a literacy product to represent their developing understanding. They discuss and identify patterns and relationships within their observations. Students consider the current views of scientists and deepen their own understanding.

Assessment focus



Formative assessment is an important aspect of the *Explain* phase. It involves monitoring students' developing understanding and giving feedback that extends their learning. It involves monitoring students' developing understanding of:

- the basic needs that living things such as animals need to meet in order to survive, exploring and observing using their senses. You will also monitor their developing science inquiry skills (see page 2).

Key lesson outcomes

Science

Students will be able to:

- identify and describe the basic needs for survival, such as: air, food, water and shelter
- sort objects according to whether or not they are needed for survival.

Literacy

Students will be able to:

- use talk to justify and give reasons for preferences
- represent their understanding of human needs using a sorting diagram.

This lesson also provides opportunities to monitor the development of students' general capabilities (highlighted through icons, see page 5).

Teacher background information

The focus of this unit is the minimal needs for survival. Students will often mention many things that they want in their lives. Basic survival is not enough for most humans, who feel the need for love, companionship and possessions in order to be happy. While these are necessary to most humans, it is possible to live without some of them, for example, hermits live in seclusion. In contrast, it is not possible to live without air, food, water or shelter for extended periods.

The basic need for shelter for mammals is determined by the characteristics of the animal and the characteristics of the environment, including temperature and potential dangers. In an extreme environment, humans cannot live for long without shelter, for example, many layers of clothing and an igloo are necessary in freezing, icy conditions. Humans often prefer a controlled, warm, safe environment because it provides optimal comfort, however they may not always need it.

Equipment

FOR THE CLASS

- class science journal
- word wall
- information wall
- 'Pet and person' table
- team roles chart
- team skills chart
- backpack filled with different objects needed for survival and objects that are not needed for survival (see 'Preparation')
- self-adhesive tape or 2 hoops (see 'Preparation')
- 1 enlarged copy of 'Needed or not' (Resource sheet 5)
- *Optional:* magazines and catalogues
- *Optional:* digital camera

FOR EACH TEAM

- role wristbands or badges for Manager and Speaker
- each team member's science journal
- 1 copy of 'Needed or not' (Resource sheet 5) per team member

Preparation

- Read 'How to organise collaborative learning teams' (Appendix 1). Display an enlarged copy of the team skills chart and the team roles chart in the classroom. Prepare role wristbands or badges and the equipment table.
- Prepare an enlarged copy of 'Needed or not' (Resource sheet 5).

Optional: Display 'Needed or not' (Resource sheet 5) on an interactive whiteboard or a computer connected to a projector. Check the Primary**Connections** website to see if an accompanying interactive resource has been developed:

www.science.org.au/primaryconnections

- Prepare two self-adhesive tape circles or hoops on the floor to make a sorting diagram. Put one of the following titles in each circle: 'Needed' and 'Not needed'.
- Organise items to put in the backpack. There should be at least one item per team. Items might include:

Needed to stay alive	Not needed to stay alive
<ul style="list-style-type: none"> • tin of baked beans • box of crackers • sleeping bag (if appropriate) • apple • water bottles • tent • warm clothing (if appropriate) • orange 	<ul style="list-style-type: none"> • magazines • sunglasses • CD player • towel • pencil case • packet of tissues • tennis ball • deck of cards

Lesson steps

- 1 Organise students to sit on the floor so they can all see the prepared sorting diagram.
- 2 Ask students who have been looking after the class pet since the previous science lesson to share observations they have made about the pet with the class. Ask students if they had to make any changes to the class pet's shelter, such as rearranging the shelter or cleaning it. Review the 'Pet and person' table and the class science journal.



- 3 Review students' understanding of what animals need to stay alive by asking questions such as:
 - What do people need to survive?
 - What does our class pet need to stay alive?
 - How do we find the things we need?



- 4 Explain to the students that you are going camping on the weekend and you will be taking some equipment. You will need to take some items to stay alive but you want to take other items as well. Ask students for ideas about the differences between needing something and wanting something.

- 5 Show students your backpack with different items inside. Take out each item and make sure all students know what it is and what it is used for. Place all the items on the floor near the sorting diagram so that all the students are able to see them clearly.

- 6 Explain that students will be working in collaborative learning teams to sort the items and decide which items you need to take on the camping trip to stay alive. Teams will need to provide reasons why you need or don't need to take each item.

Optional: Complete the sorting diagram as a class.



- 7 If students are using collaborative learning teams for the first time, introduce and explain the team skills chart and the team roles chart. Explain that students will use

wristbands or badges to help them (and you) know which role each team member should be doing.

Show students the equipment table and discuss its use. Explain that this table is where Managers will collect and return equipment.



- 8 Introduce the class sorting diagram and explain that students will be using it to present their information. Discuss the purpose and features of a sorting diagram.

Literacy focus

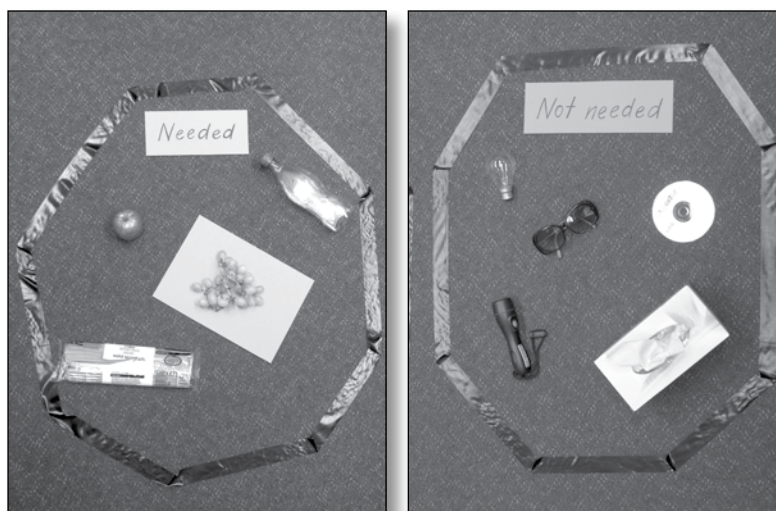
Why do we use a sorting diagram?

We use a **sorting diagram** to show how things fit into different groups.

What does a sorting diagram include?

A **sorting diagram** includes two or more groups which do not overlap. It might include headings for each of the groups.

- 9 Model how to place one of the items from the backpack in the appropriate circle of the sorting diagram and provide a reason for your decision.



Sample of 'Sorting diagram'



- 10 Form teams and allocate roles.



- 11 Ask Managers to choose an item from the backpack. Each team will discuss whether you need that item to stay alive on a camping trip and give reasons for their decision.



- 12 When teams have made their decisions, ask each Manager to place their item in the appropriate circle of the sorting diagram. Speakers explain to the class why they put their item in that circle.

- 13 When all items have been placed in the class sorting diagram, discuss whether each object is placed in the most appropriate circle of the sorting diagram. Ask students if they think any of the items in the diagram should be moved and to give reasons.

Note: This is an opportunity to challenge students' non-scientific ideas and to address the difference between needs and wants.



- 14 Introduce the enlarged copy of 'Needed or not' (Resource sheet 5) to the class.

Explain that students will be creating their own sorting diagram by cutting out the pictures and pasting them in the appropriate circle. Allow time for students to complete the sheet and share it with a partner, giving reasons for their choices.

Optional: Students use pictures cut from magazines or catalogues or draw their own pictures in 'Needed or not' (Resource sheet 5).

Note: This is an opportunity for formative assessment.

Optional: Organise for a community member who helps with basic needs and survival such as a dentist, doctor, nurse, nutritionist, The Royal Society for the Prevention of Cruelty to Animals (RSPCA) worker or vet to visit the class.

- 15 Update the word wall and information wall with words and images.

Curriculum links

Science

- Compare and contrast the needs of different animals, such as a polar bear and a kangaroo.

Mathematics

- Use a sorting diagram to organise blocks into categories. Change the criteria for the categories and sort the blocks again.
- Weigh the items in the backpack and compare the size and mass of the items needed to stay alive with the items not needed to stay alive.

Studies of society and environment

- Conduct an excursion to a zoo, farm, animal shelter or animal park to explore what is provided for animals.
- Compare and contrast equipment and resources needed for camping in different climates.

Health and physical education



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The Le@rning Federation (www.thelearningfederation.edu.au)

Island life: needs and wants, Curriculum Corporation.
The Le@rning Federation learning object L1008.

Students distinguish between needs and wants when planning to live on a tropical island. Students observe the social, environmental and personal consequences of selecting needs or wants.

- Use the sorting diagram to organise foods according to the five food groups.



Indigenous perspectives

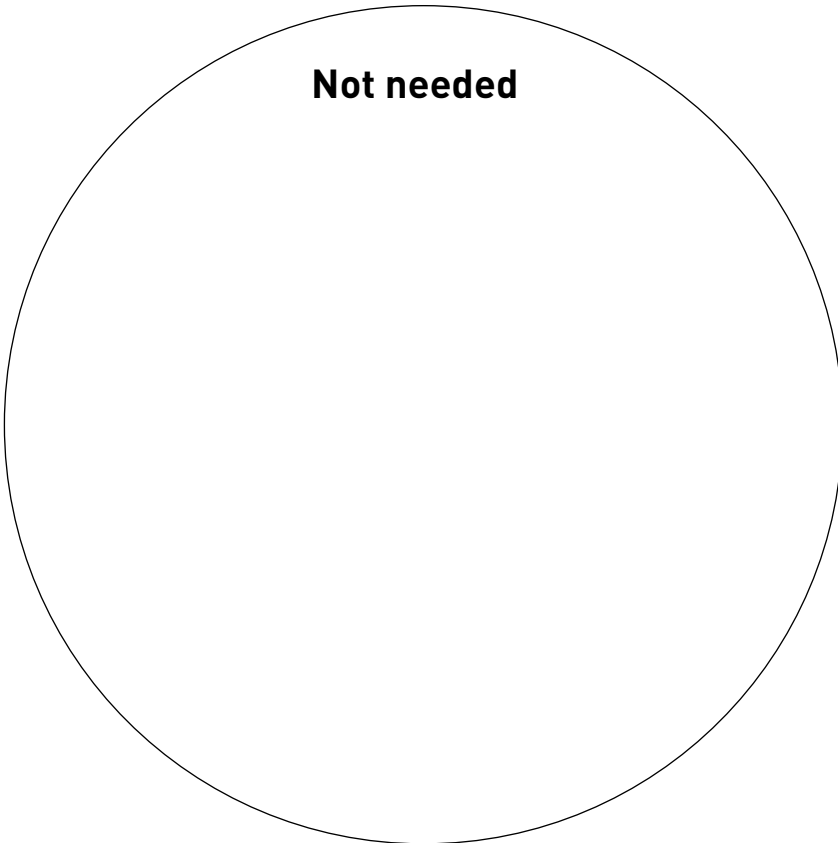
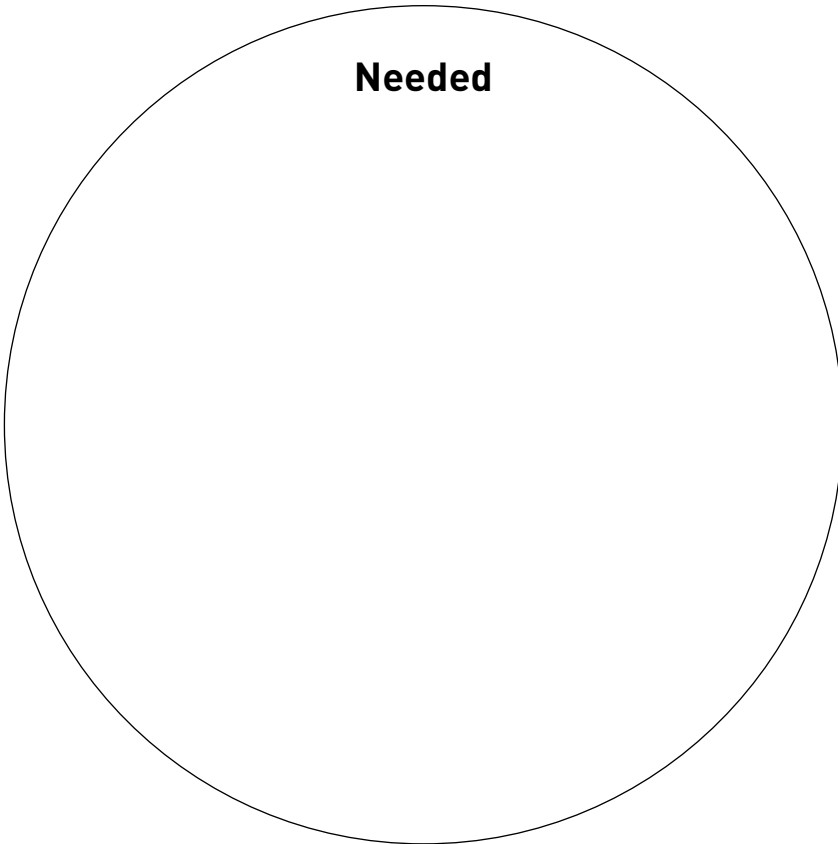
- Invite members of the local indigenous community to share their knowledge with students about how traditional Indigenous people's needs might be met by the environment. Read *Going for oysters* or *Pigs and honey*. Make a list of the things the Indigenous people needed to take with them to make their hunting trip successful.

(Adams, J. (1991). *Going for oysters*. Adelaide: Omnibus Books.)

(Adams, J. (1989). *Pigs and honey*. Adelaide: Omnibus Books.)

Needed or not

Name: _____ Date: _____



Lesson 6 How much water do I need?

AT A GLANCE

To support students to plan and conduct an investigation comparing the water needs of people and the class pet.

Students:

- discuss ideas about how to measure water consumption
- investigate and compare how much water the teacher, four students and the class pet drink during a day
- analyse a graph of the water consumption of people and a pet.

Lesson focus

In the *Elaborate* phase students plan and conduct an open investigation to apply and extend their new conceptual understanding in a new context. It is designed to challenge and extend students' Science Understanding and Science Inquiry skills.

Assessment focus



Summative assessment of the Science Inquiry Skills is an important focus of the *Elaborate* phase (see page 2). Rubrics will be available on the website to help you monitor students' inquiry skills.

Key lesson outcomes

Science

Students will be able to:

- investigate how much water the class pet, teacher and four students drink during a day
- use a graph to compare the water needs of a human and an animal
- discuss reasons for the differences in the water needs of an animal and a human.

Literacy

Students will be able to:

- participate in class discussions about the water needs of an animal and a human
- record observations and discuss findings on an investigation of how much water a teacher, four students and the class pet drink during a day.

This lesson also provides opportunities to monitor the development of students' general capabilities (highlighted through icons, see page 5).

Teacher background information

The amount of water an animal needs to take in depends on its size, how efficient the species is at conserving water and what level of physical activity the animal has undergone. It also depends on the water content of the food the animal has been eating.

Animals need water to help the body expel wastes and toxins as urine. Being dehydrated reduces the amount of urine produced by the kidneys and therefore reduces the amount of waste that can be removed from the blood stream. Animals that live in the desert have very efficient kidneys that can produce urine that is very concentrated so that less water is lost as urine.

Water is also lost through evaporation. Sometimes this is useful. For example, some mammals, including humans, use the cooling effect of evaporation to help regulate their body temperature through perspiration. The larger the surface area of the animal, the more the evaporation occurs and the more water it needs to take in. Water is also lost through breathing because our bodies release moisture into the air as we breathe it in. Our lungs need moist air to function properly and can become irritated and less resistant to infection if they become dry.

Larger animals also need more water than smaller animals because they have more cells and water is an essential component of cells and their chemical reactions. However, small animals need more water per gram of bodyweight than larger animals. For example, 500 one kilogram rabbits will need more water than a 500 kilogram steer. The focus of this investigation is on the absolute amount of water consumed rather than the amount per unit weight of the animals.

Note: You will need to comply with your state's animal ethics requirements, *Animal Welfare Act* and your school's policy on the use of animals in classroom settings.

Equipment

FOR THE CLASS

- class science journal
- word wall
- information wall
- 6 clear plastic cups (see 'Preparation')
- class graph (see 'Preparation')
- 'Measuring cups' (Resource sheet 6)
- glue or adhesive tape
- *Optional:* funnel

Preparation

Note: This activity requires a class pet that consumes an observable amount of water each day, such as: a bird, dog or ferret. If such a pet is not available, compare the water consumption of the teacher and students, or the Foundation Year class with a Year five or six class.

- Decide on a suitable observation period for the investigation, for example, one day. This should be long enough for the pet to drink an observable amount of water and will depend on the type of animal. For example, one day might be long enough if observing a bird, dog or ferret but one week might be more suitable for a rabbit or guinea pig.
- Provide small clear plastic cups of the same size for the class pet, each of the four students and you. Write names the on the cups and mark a line about 2cm from the brim. These should be small enough that students and the class pet will drink several cups of water each during the investigation period.
- Prepare a blank page in the class science journal for a graph with the title, 'How much do we drink?'. Include a row for the class pet, each of the four students and you.
Note: If recording the water consumption of all students in the class a larger graph will be required such as one drawn on butcher's paper.
- Cut out the pictures of cups on 'Measuring cups' (Resource sheet 6). Arrange to store the pictures and glue or adhesive tape near the class graph.
- Prepare the class pet's shelter so that the water dispenser can be easily observed.

Lesson steps

- 1 Review the class science journal, word wall and information wall. Ask students to share their observations of the class pet with the class. Discuss with students the needs of people, asking questions such as:
 - What do humans need to stay alive?
 - Why do we need food?
 - Why do we need water?
 - How do our bodies lose water?
- 2 Introduce a cup of water and ask students if they would drink more or less than the cup of water in a day. Explain that students can give their answer by standing in an allocated space for 'more' and another space for 'less'. Ask students if they think the class pet might drink more or less than the cup of water in a day. Encourage students to move to the allocated spaces for 'more' or 'less' depending on their answer.
- 3 Ask students to suggest ideas about how they could find out whether the class pet or students drink more water in a day. Ask questions such as:
 - How do we know how much water we drink?
(We can see there is less water in our cup.)
 - How do we know how much water the class pet drinks?
(We can see there is less water in the class pet's water dispenser.)
 - How can we record the amount of water we drink?
(Count the number of full cups of water we drink.)
 - How can we record the amount of water the class pet drinks?
(Count the number of full cups of water the class pet drinks.)



4 Explain that students are going to investigate how much water the teacher, four students and class pet drink in a day. They will do this by comparing the number of cups of water they drink during this time.



5 Ask students what they think the word 'fair' means. Ask questions such as:

- Would it be fair if we use a small cup for the teacher and a large cup for the class pet?
(Show a large and small cup to reinforce the 'unfairness' of using different cups.)
- Would it be fair if we measure how much the class pet drinks in a day and how much the students drink in only half a day?
(Reinforce that we need to measure over the same time for everyone.)

6 Discuss with students that they will:

- Measure the number of cups of water drunk
- Keep it fair by using the same sized cup and measure for the same time.



7 Ask students for ideas about how they will record how many cups of water the teacher, four students and the class pet will drink during the day. (Use a picture of a cup for each cup of water they drink.) Explain to students that this is called a graph. Discuss the purpose and features of a graph.

Literacy focus

Why do we use a graph?

We use a **graph** to show information so we can look for patterns. We use different types of graphs, such as picture, column or line graphs, for different situations.

What does a graph include?

A **graph** includes a title, axes with labels and the units of measurement.

8 Introduce and discuss the 'How much do we drink?' graph. Write the class pet's name on the first line and the teacher's name on the second line. Select four students—two boys and two girls—and write their names on the next four lines.

Optional: Include all students in the class investigation and measure the water consumption of each student.



9 Model how to fill the cup to the marked line and explain that when each of the four students finish drinking a cup of water they will need to paste or tape a picture of a cup on the graph next to their name, refill their cup and continue the investigation. Ask students to only drink water when they feel thirsty. Reinforce that it is not a contest to see who can drink the most water.

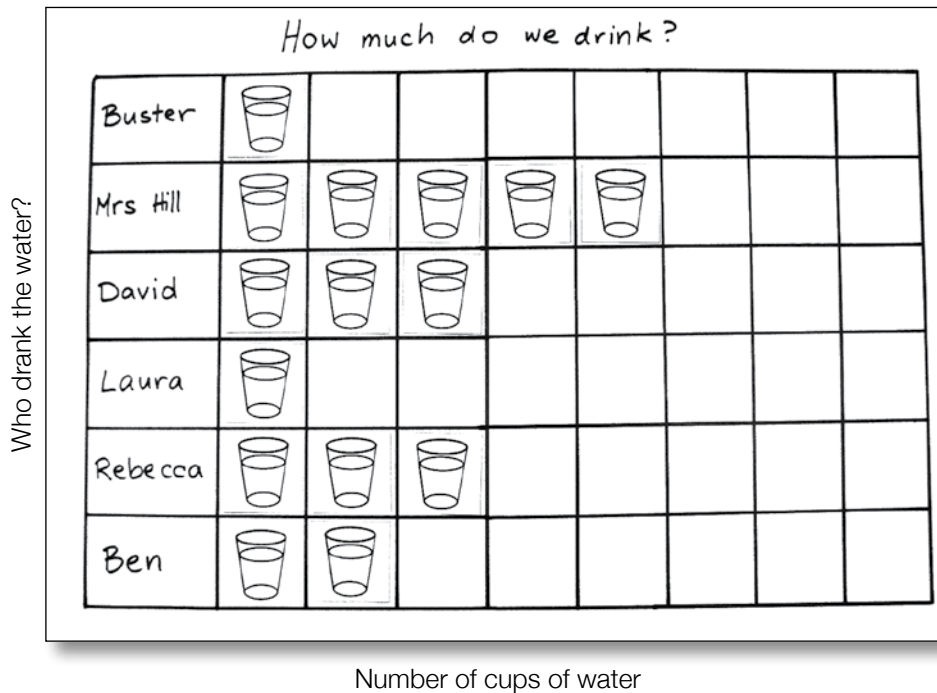
Note: Provide a suitable area for students to keep their cups during the investigation. Model how to fill another cup to the marked line and pour the water from the cup into the class pet's water dispenser, using a funnel if necessary. (Ensure that the class pet's water dispenser is empty before adding the water.) Record this cup of water on the graph. Select one student to regularly check the class pet's drink dispenser. When it is empty they should add a picture of a cup to the graph next to the pet's name and add another cup of water to the dispenser.

- 10** Ask students to predict what they think will happen during the investigation. Ask questions such as:
- Who will drink the most water during a day—the teacher, one of the four students or the class pet?
 - How will the graph show us who drinks the most cups of water?
- 11** After the investigation is completed, use the graph to compare the water intake of the teacher, each of the four students and the class pet. Ask questions such as:
- How many cups of water did the class pet drink?
 - Who drank the most cups of water?
 - Why do you think the class pet drank more or less than some of the students?
 - Did these results match what we thought at the start of the lesson (Lesson step 2)?
 - How did we make sure the test was fair? (We used the same sized cups and measured for the same time.)

Record students' ideas in the class science journal.



ELABORATE



Sample graph comparing water consumption

- 12** Update the word wall and information wall with words and images.

Curriculum links

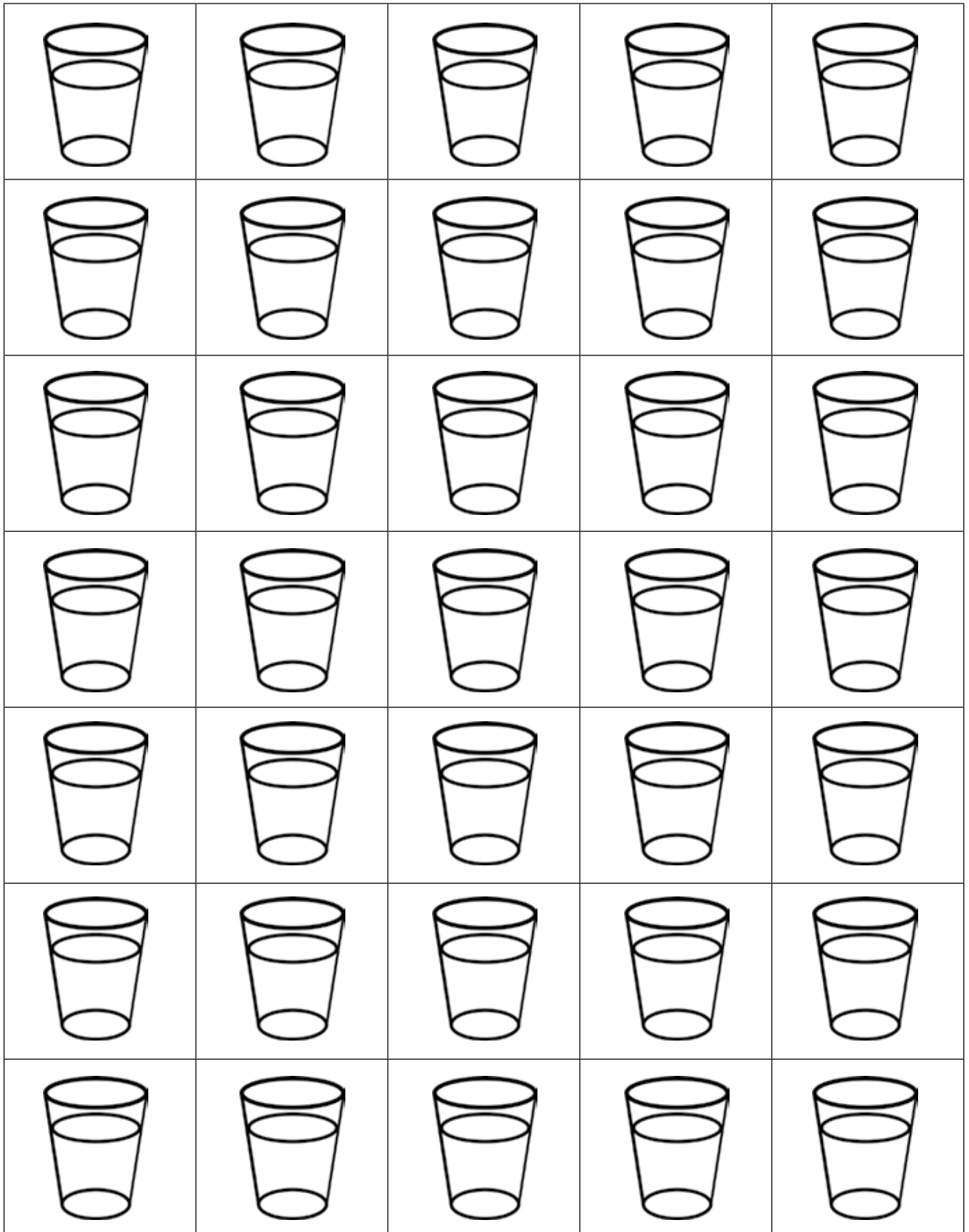
Mathematics

- Make picture graphs about other basic needs, for example, how many pieces of fruit each student eats in a day.

Studies of society and environment

- Discuss factors that affect water usage, such as seasonal changes, other water uses and users.

Measuring cups



Lesson 7 Sensational reviews

AT A GLANCE

To provide opportunities for students to represent what they know about how living things have basic needs, including food and water, and to reflect on their learning during the unit.

Students:

- review the unit using the class science journal, word wall and other resources developed during the unit
- represent their ideas about the basic needs for survival and the senses
- reflect on their learning during this unit.

Lesson focus

In the *Evaluate* phase students reflect on their learning journey and create a literacy product to re-represent their conceptual understanding.

Assessment focus



Summative assessment of the Science Understanding descriptions is an important aspect of the *Evaluate* phase. In this lesson you will be looking for evidence of the extent to which students understand:

- how living things, such as animals, have basic needs that need to be met to survive, including food, water, air and space, that science involves exploring and observing the world using senses.

Literacy products in this lesson provide useful work samples for assessment using the rubrics provided on the Primary**Connections** website.

Key lesson outcomes

Science

Students will be able to:

- identify the basic needs of an animal and a human
- name the senses
- explain how the senses assist animals, including humans,
- to be safe.

Literacy

Students will be able to:

- contribute to a discussion about basic needs for survival and the use of senses
- create an ideas map about the needs of animals, including humans.

This lesson also provides opportunities to monitor the development of students' general capabilities (highlighted through icons, see page 5).

Equipment

FOR THE CLASS

- class science journal
- word wall
- information wall
- 'Pet and person' table (L1 S1)
- 'My five senses' question chart (L2 S2)
- 'Senses alert' table (L2 S2)
- 1 enlarged copy of 'Senses mix-up' (Resource sheet 7)

FOR EACH STUDENT

- science journal
- 1 copy of 'Circles about me' (Resource sheet 1)
- 1 copy of 'Senses mix-up' (Resource sheet 7)

Preparation

- Prepare an enlarged copy of 'Senses mix-up' (Resource sheet 7).
- *Optional:* Display 'Senses mix-up' (Resource sheet 7) on an interactive whiteboard or a computer connected to a projector. Check the Primary**Connections** website to see if an accompanying interactive resource has been developed:
www.science.org.au/primaryconnections

Lesson steps



- 1 Ask students who have been looking after the class pet since the previous science lesson to share observations they have made about the pet with the class. Encourage students to reflect on their care of the class pet during the unit. Review the 'Pet and person' table, class science journal, including the 'My five senses' question chart and

the 'Senses alert' table. Encourage students to recall observations they made that showed them the needs of animals and how they use their senses to be safe.

- 2** Review the ideas maps that students completed in Lesson 1. Ask students if they now think these things are all needed to stay alive.

- 3** Explain that students will be completing a new copy of 'Circles about me' (Resource sheet 1). Provide students with a new copy of 'Circles about me' (Resource sheet 1) and encourage students to draw the things they need to stay alive.



Encourage students to compare the new ideas map with the ideas map completed in Lesson 1 and discuss how they have learned new things.

Optional: Discuss how scientists look for evidence for their ideas.



Ask students to paste their new copy of 'Circles about me' (Resource sheet 1) into their science journals.

- 4** Introduce the enlarged copy of 'Senses mix-up' (Resource sheet 7).

Explain that students will identify the sense associated with each body part. Students will then draw a coloured line matching the body part on the left with an example of how they could use the sense related to that body part. Model how to complete the activity using one of the senses, for example, by drawing a line connecting the nose to the flower.



Ask students to provide reasons for why they matched each picture to the particular sense.

Optional: Ask students to cut the pictures of the sensory experiences out and paste them next to the appropriate body part.

Optional: Ask students to write the names of the senses or body parts on the sheet.

Ask students to paste 'Senses mix-up' (Resource sheet 7) into their science journal.



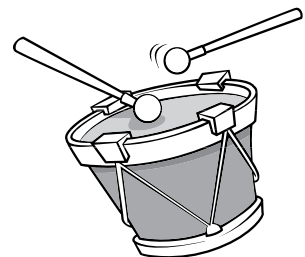
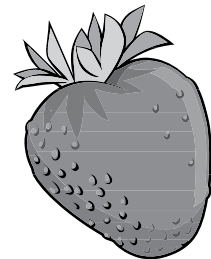
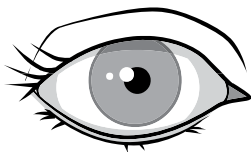
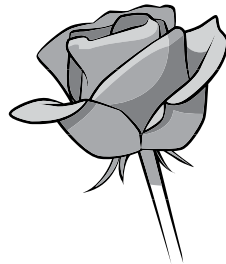
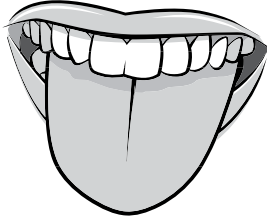
- 5** Review the *Staying alive* unit with the class, asking questions such as:

- Which activity helped you learn something new?
- What are you still wondering about?
- Which activity did you like the best?
- What did you learn about working with a partner?

Record students' responses in the class science journal.

Senses mix-up

Name: _____ Date: _____



Appendix 1

How to organise collaborative learning teams (Foundation–Year 2)

Introduction

Students working in collaborative teams is a key feature of the PrimaryConnections inquiry-based program. By working in collaborative teams students are able to:

- communicate and compare their ideas with one another
- build on one another's ideas
- discuss and debate these ideas
- revise and rethink their reasoning
- present their final team understanding through multi-modal representations.

Opportunities for working in collaborative learning teams are highlighted throughout the unit.

Students need to be taught how to work collaboratively. They need to work together regularly to develop effective group learning skills.

The development of these collaborative skills aligns to descriptions in the Australian Curriculum: English. See page 7.

Team structure

The first step towards teaching students to work collaboratively is to organise the team composition, roles and skills. Use the following ideas when planning collaborative learning with your class:

- Assign students to teams rather than allowing them to choose partners.
- Vary the composition of each team. Give students opportunities to work with others who might be of a different ability level, gender or cultural background.
- Keep teams together for two or more lessons so that students have enough time to learn to work together successfully.
- Keep a record of the students who have worked together as a team so that by the end of the year each student has worked with as many others as possible.

Team roles

Students are assigned roles within their team (see below). Each team member has a specific role but all members share leadership responsibilities. Each member is accountable for the performance of the team and should be able to explain how the team obtained its results. Students must therefore be concerned with the performance of all team members. It is important to rotate team jobs each time a team works together so that all students have an opportunity to perform different roles.

For F–Year 2, teams consist of two students—Manager and Speaker. (For Year 3–Year 6, the teams consist of three students—Director, Manager and Speaker). Each member of the team should wear something that identifies them as belonging to that role, for example

a wristband, badge, or coloured clothes peg. This makes it easier for you to identify which role each student is doing and it is easier for the students to remember what they and their team mates should be doing.

Manager

The Manager is responsible for collecting and returning the team's equipment. The Manager also tells the teacher if any equipment is damaged or broken. All team members are responsible for clearing up after an activity and getting the equipment ready to return to the equipment table.

Speaker

The Speaker is responsible for asking the teacher or another team's Speaker for help. If the team cannot resolve a question or decide how to follow a procedure, the Speaker is the only person who may leave the team and seek help. The Speaker shares any information they obtain with team members. The teacher may speak to all team members, not just to the Speaker. The Speaker is not the only person who reports to the class; each team member should be able to report on the team's results.

Director (Year 3–Year 6)

The Director is responsible for making sure that the team understands the team investigation and helps team members focus on each step. The Director is also responsible for offering encouragement and support. When the team has finished, the director helps team members check that they have accomplished the investigation successfully. The Director provides guidance but is not the team leader.

Team skills

Primary**Connections** focuses on social skills that will help students work in collaborative teams and communicate more effectively.

Students will practise the following team skills throughout the year:

- Move into your teams quickly and quietly
- Stay with your team
- Take turns.

To help reinforce these skills, display enlarged copies of the team skills chart (see the end of this Appendix) in a prominent place in the classroom.

Supporting equity



In science lessons, there can be a tendency for boys to manipulate materials and girls to record results. Primary**Connections** tries to avoid traditional social stereotyping by encouraging all students, irrespective of their gender, to maximise their learning potential. Collaborative learning encourages each student to participate in all aspects of team activities, including handling the equipment and taking intellectual risks.

Observe students when they are working in their collaborative teams and ensure that both girls and boys are participating in the hands-on activities.

TEAM ROLES

Manager

Collects and returns all materials the team needs

Speaker

Asks the teacher and other team speakers for help

TEAM SKILLS

- 1 Move into your teams quickly and quietly**
- 2 Stay with your team**
- 3 Take turns**

Appendix 2

How to use a science journal

Introduction

A science journal is a record of observations, experiences and reflections. It contains a series of dated, chronological entries. It can include written text, drawings, labelled diagrams, photographs, tables and graphs.

Using a science journal provides an opportunity for students to be engaged in a real science situation as they keep a record of their observations, ideas and thoughts about science activities. Students can use their science journals as a useful self-assessment tool as they reflect on their learning and how their ideas have changed and developed during a unit.

Monitoring students' journals allows you to identify students' alternative conceptions, find evidence of students' learning and plan future learning activities in science and literacy.








Maintaining a science journal aligns to descriptions in the Australian Curriculum: Science and English. See pages 2 and 7.

Using a science journal

- 1** At the start of the year, or before starting a science unit, provide each student with a notebook or exercise book for their science journal or use an electronic format. Tailor the type of journal to fit the needs of your classroom. Explain to students that they will use their journals to keep a record of their observations, ideas and thoughts about science activities. Emphasise the importance of including pictorial representations as well as written entries.
- 2** Use a large project book or A3 paper to make a class science journal. This can be used at all year levels to model journal entries. With younger students, the class science journal can be used more frequently than individual journals and can take the place of individual journals.
- 3** Make time to use the science journal. Provide opportunities for students to plan procedures and record predictions, and their reasons for predictions, before an activity. Use the journal to record observations during an activity and reflect afterwards, including comparing ideas and findings with initial predictions and reasons. It is important to encourage students to provide evidence that supports their ideas, reasons and reflections.
- 4** Provide guidelines in the form of questions and headings and facilitate discussion about recording strategies, such as note-making, lists, tables and concept maps. Use the class science journal to show students how they can modify and improve their recording strategies.
- 5** Science journal entries can include narrative, poetry and prose as students represent their ideas in a range of styles and forms.

- 6 In science journal work, you can refer students to display charts, pictures, diagrams, word walls and phrases about the topic displayed around the classroom. Revisit and revise this material during the unit. Explore the vocabulary, visual texts and ideas that have developed from the science unit, and encourage students to use them in their science journals.
- 7 Combine the use of resource sheets with journal entries. After students have pasted their completed resource sheets in their journal, they might like to add their own drawings and reflections.
- 8 Use the science journal to assess student learning in both science and literacy. For example, during the *Engage* phase, use journal entries for diagnostic assessment as you determine students' prior knowledge.
- 9 Discuss the importance of entries in the science journal during the *Explain* and *Evaluate* phases. Demonstrate how the information in the journal will help students develop literacy products, such as posters, brochures, letters and oral or written presentations.

Staying alive science journal

 Staying alive		
Puff piece Name: <u>Aimee</u> Date: <u>10th March</u>		
  I can feel my breathing and my heart. It is slow.	  I did some skipping.	  My breathing and my heart changed. It went faster. I felt a bit sweaty.
Before	During	After
Resource sheet 4		

Appendix 3

How to use a word wall

Introduction

A word wall is an organised collection of words and images displayed in the classroom. It supports the development of vocabulary related to a particular topic and provides a reference for students. The content of the word wall can be words that students see, hear and use in their reading, writing, speaking, listening and viewing.

Creating a class word wall, including words from different dialects and languages, aligns to descriptions in the Australian Curriculum: English. See page 7.

Goals in using a word wall

A word wall can be used to:

- support science and literacy experiences of reading, viewing, writing and speaking
- provide support for students during literacy activities across all key learning areas
- promote independence in students as they develop their literacy skills
- provide a visual representation to help students see patterns in words and decode them
- develop a growing bank of words that students can spell, read and/or use in writing tasks
- provide ongoing support for the various levels of academic ability in the class
- teach the strategy of using word sources as a real-life strategy.

Organisation

Position the word wall so that students have easy access to the words. They need to be able to see, remove and return word cards to the wall. A classroom could have one main word wall and two or three smaller ones, each with a different focus, for example, high-frequency words.

Choose robust material for the word cards. Write or type words on cardboard and perhaps laminate them. Consider covering the wall with felt-type material and backing each word card with a self-adhesive dot to make it easy for students to remove and replace word cards.

Word walls do not need to be confined to a wall. Use a portable wall, display screen, shower curtain or window curtain. Consider a cardboard shape that fits with the unit, for example, an animal silhouette for an animal characteristics unit. The purpose is for students to be exposed to a print-rich environment that supports their science and literacy experiences.

Organise the words on the wall in a variety of ways. Place them alphabetically, or put them in word groups or groups suggested by the unit topic, for example, words for a *Staying alive* unit might be organised using headings, such as 'Senses', 'Pets' and 'Needs'.



Sounds sensational word wall

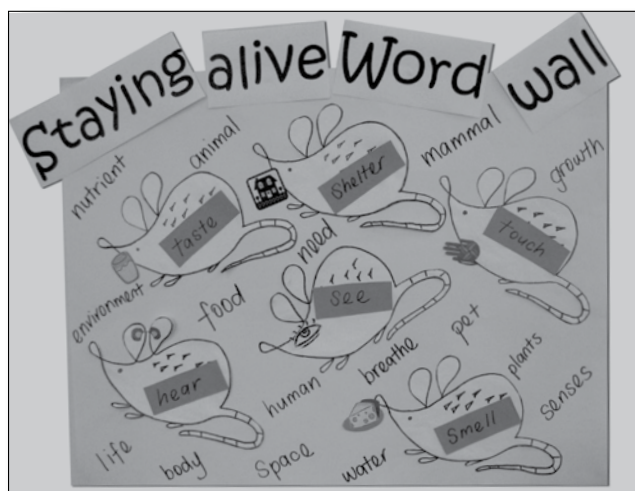


Material world word wall

Invite students to contribute words from different languages to the word wall. Group words about the same thing, for example, different names of the same animal, on the word wall so that students can make the connections. Identify the different languages used, for example, by using different coloured cards or pens to record the words.

Using a word wall

- 1 Limit the number of words to those needed to support the science and literacy experiences in the classroom.
- 2 Add words gradually, and include images where possible, such as drawings, diagrams or photographs. Build up the number of words on the word wall as students are introduced to the scientific vocabulary of the unit.
- 3 Encourage students to interact with the word wall. Practise using the words with students by reading them and playing word games. Refer to the words during science and literacy experiences and direct students to the wall when they need a word for writing. Encourage students to use the word wall to spell words correctly.
- 4 Use the word wall with the whole class, small groups and individually during literacy experiences. Organise multi-level activities to cater for the individual needs of students.



Staying alive word wall

Appendix 4 Staying alive equipment list

EQUIPMENT ITEM	QUANTITIES	LESSON						
		1	1	2	2	3	3	3
Equipment and materials								
adhesive tape <i>optional</i>	1 per class							•
backpack of objects (see 'Preparation' Lesson 5 for list of objects)	1 per class							•
blindfold <i>optional</i>	4 per class		•					
booklet – 'All about my pet'	1 per student	•						
bucket, filled with water	2 per class				•			
class pet	1 per class	•						
container (opaque eg, box or brown paper bag)	1 per class		•					
container (margarine)	2 per class			•				
cotton wool balls	8 per class				•			
cups – clear plastic	6 per class							•
<i>eucalyptus</i> oil	1 per class				•			
factual texts about the senses, pets, and the needs of animals, including humans	selection per class	•	•	•	•	•	•	•
funnel <i>optional</i>	1 per class							•
games (physical activities and games)	selection per class					•		
glue <i>optional</i>	1 per class							•
graph	1 per class							•
hoops (or tape)	2 hoops per class							•
images – busy road	2 per class				•			
magazines <i>optional</i>	selection per class	•						•
modelling materials (eg, straws, popsticks, cardboard, plasticine)	selection per student							•
mystery objects	selection per student		•					
mystery object (eg, flower, seeds, leaf, piece of fruit)	1 per class		•					
newspaper (large sheet)	1 large sheet per class							•
sardines (tin)	1 tin per class							•
self-adhesive dot (blue and red)	1 per class				•			
self-adhesive notes	2 per student					•		
stopwatch <i>optional</i>	1 per class						•	
table – 'Senses alert'	1 per class							•

EQUIPMENT ITEM	QUANTITIES	LESSON							
		1	1	2	2	3	3	3	
		1	2	1	2	1	2	3	
		SESSION							
Equipment and materials (Continued)									
vanilla essence	1 per class				•				
whistle	1 per class				•				
Resource sheets									
'Circles about me' (RS1)	1 per student	•							•
'Circles about me' (RS1), enlarged	1 per class	•							
'Information note for families' (RS2)	1 per student		•						
'Senses alert' (RS3)	1 per student			•					
'Sense alert' (RS3), enlarged	1 per student			•					
'Puff piece' (RS4)	1 per student					•			
'Puff piece' (RS4), enlarged	1 per class					•			
'Needed or not' (RS5)	1 per student								•
'Needed or not' (RS5), enlarged	1 per class								•
'Measuring cups' (RS6), enlarged	1 per class								•
'Senses mix-up' (RS7)	1 per student								•
'Senses mix-up' (RS7), enlarged	1 per class								•
Teaching tools									
class science journal	1 per class	•	•	•	•	•	•	•	•
Information wall	1 per class	•	•	•	•	•	•	•	•
'Pet and person' table	1 per class	•			•			•	•
pet care roster	1 per class	•	•	•	•	•	•	•	•
pet – photo	1 per student		•						
role wristbands or badges	1 set per team								•
student science journal	1 per student	•					•		•
team roles chart	1 per class								•
team skills chart	1 per class								•
T-chart	1 per class						•		
word wall	1 per class	•	•	•	•	•	•	•	•
Multimedia									
digital camera <i>optional</i>	1 per class								•

Appendix 5 Staying alive unit overview

		SCIENCE OUTCOMES*	LITERACY OUTCOMES*	LESSON SUMMARY	ASSESSMENT OPPORTUNITIES
ENGAGE	<p>Students will be able to represent their current understanding as they:</p> <ul style="list-style-type: none"> observe the characteristics of a class pet identify the basic needs of the class pet represent the things an animal and humans need to stay alive. 	<p>Students will be able to:</p> <ul style="list-style-type: none"> contribute to discussions about the needs of an animal and humans record ideas using words, drawings or photographs. 	<p>Students:</p> <p>Session 1 Our new friend</p> <ul style="list-style-type: none"> discuss the care of the class pet contribute to a code of conduct for caring for the pet record what they think they know about the needs of a pet and a person to stay alive. <p>Session 2 Meet my pet</p> <ul style="list-style-type: none"> create drawings or use photographs to represent their pet observe the needs of their own pets in the home environment. 	<p>Diagnostic assessment</p> <p>Science journal entries</p> <p>Class discussion</p> <p>Word wall contributions</p> <p>'Pet and Person' table</p> <p>Ideas map</p> <p>'Circles about me' (Resource sheet 1)</p>	
	<p>Lesson 1 Handle with care</p> <p>Session 1 Our new friend</p> <p>Session 2 Meet my pet</p>				

* These lesson outcomes are aligned to relevant descriptions of the Australian Curriculum. See page 2 for Science and page 7 for English and Mathematics.

SCIENCE OUTCOMES*		LITERACY OUTCOMES*	LESSON SUMMARY	ASSESSMENT OPPORTUNITIES
<p>Students will be able to:</p> <ul style="list-style-type: none"> • identify the senses of touch, hearing, smell, sight and taste • identify the body parts associated with the senses • recognise how the senses help us make decisions about unsafe situations. 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • participate in discussions about the senses • contribute ideas to a question chart • identify the broad purposes and features of a table. 	<p>Students:</p> <p>Session 1 Sorting our senses</p> <ul style="list-style-type: none"> • use their senses to describe a mystery object • identify the body parts associated with the different senses • use a question chart to record descriptions of sensory experiences. <p>Session 2 Senses detectives</p> <ul style="list-style-type: none"> • use senses to make decisions about different situations they may encounter in their everyday life • record observations in a class table. 	<p>Formative assessment</p> <p>Science journal entries</p> <p>Class discussion</p> <p>Word wall contributions</p>	
<p>Lesson 2 Stretch your senses</p> <p>Session 1 Sorting our senses</p> <p>Session 2 Senses detectives</p>	<p>EXPLORE</p>			

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EXPLORE	SCIENCE OUTCOMES*	LITERACY OUTCOMES*	LESSON SUMMARY	ASSESSMENT OPPORTUNITIES
	<p>Students will be able to:</p> <ul style="list-style-type: none"> • identify food, air and water as basic needs of animals and humans • recall and record food intake during a day • compare what happens to our bodies before and after high-level physical activity • describe why we need water in our bodies. 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • contribute to discussions about basic needs of pets and people • contribute to a T-chart about the needs of pets and people • create a storyboard describing what happens to our bodies after high-level physical activity. 	<p>Students:</p> <p>Session 1 Chomp, chomp!</p> <ul style="list-style-type: none"> • discuss food and what makes them hungry • record what food they eat during a day. <p>Session 2 Huff and puff</p> <ul style="list-style-type: none"> • explore how their breathing changes after high-level physical activity • explore other changes to their body after high-level physical activity. <p>Session 3 Slurp and see</p> <ul style="list-style-type: none"> • discuss why we need to drink water • discuss what happens to our bodies when we drink water. 	<p>Formative assessment</p> <p>Science journal entries</p> <p>Class discussion</p> <p>Word wall contributions</p> <p>T-chart</p> <p>POE strategy</p> <p>Storyboards</p> <p>'Puff piece' (Resource sheet 3)</p>

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		SCIENCE OUTCOMES*		LITERACY OUTCOMES*		LESSON SUMMARY		ASSESSMENT OPPORTUNITIES	
EXPLORE	Lesson 4 Space and shelter	Students will be able to:	Students will be able to:	Students will be able to:	Students:	<ul style="list-style-type: none"> play games to experience competing with others for space explore an area with a lot of space discuss the protection and shelter provided by their home space compare their home space with the class pet's space. 	<p>Formative assessment</p> <p>Science journal entries</p> <p>Class discussion</p> <p>Word wall contributions</p>		
	Lesson 5 Take it or leave it	Students will be able to:	Students will be able to:	Students will be able to:	Students:	<ul style="list-style-type: none"> record the basic needs of animals, including humans. 	<p>Formative assessment</p> <p>Science journal entries</p> <p>Class discussion</p> <p>Word wall contributions</p> <p>Sorting diagram</p> <p>'Needed or not' (Resource sheet 4)</p>		

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		SCIENCE OUTCOMES*		LITERACY OUTCOMES*		LESSON SUMMARY		ASSESSMENT OPPORTUNITIES	
ELABORATE	Lesson 6 How much water do I need?	Students will be able to:	Students will be able to:	Students will be able to:	Students:	<ul style="list-style-type: none"> investigate and compare how much water the teacher, four students and the class pet drink during a half day record findings on an investigation planner. 	<p>Summative assessment</p> <ul style="list-style-type: none"> Science journal entries Class discussion Word wall contributions Graph 		
		<ul style="list-style-type: none"> investigate how much water the teacher, four students and the class pet drink during a half day compare the water needs of an animal and a human discuss reasons for the differences in the water needs of an animal and a human. 	<ul style="list-style-type: none"> participate in discussions about the water needs of an animal and a human record observations and report on an investigation of how much water the class pet and each student drinks during a half day. 	<ul style="list-style-type: none"> contribute to discussions about basic needs for survival and the use of senses create an ideas map about the needs of animals, including humans. 	<ul style="list-style-type: none"> review the unit using the science journal, word wall and other resources developed during the unit represent their ideas about the basic needs for survival and the senses reflect on their learning during this unit. 	<p>Summative assessment</p> <ul style="list-style-type: none"> Science journal entries Class discussion Word wall contributions 'Circles about me' (Resource sheet 1) 'Senses mix-up' (Resource sheet 7) 			
EVALUATE	Lesson 7 Sensational reviews	Students will be able to:							
		<ul style="list-style-type: none"> identify the basic needs of an animal and a human name the senses explain how the senses assist animals, including humans, to be safe. 							

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Professional learning

PrimaryConnections: linking science with literacy is an innovative program linking the teaching of science with the teaching of literacy in primary schools. The program includes a professional learning component and curriculum units aligned to the Australian Curriculum: Science.

Research has shown that the professional learning component of the **PrimaryConnections** program significantly enhances the implementation of the curriculum units. Professional Learning Facilitators are available throughout Australia to conduct a variety of workshops. At the heart of the professional learning program is the Curriculum Leader Training Program.

PrimaryConnections Curriculum Leader Training Program

Held annually, this two-day workshop develops a comprehensive understanding of the **PrimaryConnections** program. Participants receive professional learning resources that can be used to train others in **PrimaryConnections**.

PrimaryConnections one-day Introduction to PrimaryConnections Program

This workshop develops knowledge and understanding of **PrimaryConnections**, and the benefits to enhance the teaching and learning of science and literacy.

The professional learning calendar, other workshops and booking forms can be found on the website: www.science.org.au/primaryconnections

Order your next unit at
www.science.org.au/primaryconnections

Year	Biological sciences	Chemical sciences	Earth and space sciences	Physical sciences
F	<i>Staying alive</i>	<i>What's it made of?</i>	<i>Weather in my world</i>	<i>On the move</i>
1	<i>Schoolyard safari</i>	<i>Spot the difference</i>	<i>Up, down and all around</i>	<i>Look! Listen!</i>
2	<i>Watch it grow!</i>	<i>All mixed up</i>	<i>Water works</i>	<i>Push pull</i>
3	<i>Feathers, fur or leaves?</i>	<i>Melting moments</i>	<i>Night and day</i>	<i>Heating up</i>
4	<i>Plants in action</i>	<i>Material world</i>	<i>Beneath our feet</i>	<i>Smooth moves</i>
	<i>Friends and foes</i>	<i>Package it better</i>		
5	<i>Desert survivors</i>	<i>What's the matter?</i>	<i>Earth's place in space</i>	<i>Light shows</i>
6	<i>Marvellous micro-organisms</i>	<i>Change detectives</i>	<i>Earthquake explorers</i>	<i>It's electrifying</i>
				<i>Essential energy</i>

PrimaryConnections: Linking science with literacy is an innovative program linking the teaching of science with the teaching of literacy in primary schools.

The program combines a sophisticated professional learning program with exemplary curriculum resources.

PrimaryConnections features an inquiry-based approach, embedded assessment and incorporates Indigenous perspectives.

The PrimaryConnections curriculum resources span Years F–6 of primary school.

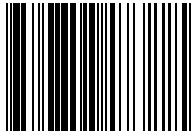
www.science.org.au/primaryconnections



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