PrimaryConnections®
Linking science with literacy

Fully aligned with the Australian Curriculum

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

Weather in my world

Foundation Year

Earth and space sciences

Primary**Connections project**

Professional learning program

Primary**Connections** comprises a professional learning program supported with exemplary curriculum resources to enhance teaching and learning in science and literacy. 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.primaryconnections.org.au

PrimaryConnections®
Linking science with literacy

Fully aligned with the Australian Curriculum

Weather in my world

Foundation Year

Earth and space sciences



Each day the weather affects our work and leisure activities. The weather influences our decisions about what to wear and the things we do. Severe weather phenomena, such as droughts, floods and cyclones have serious impacts on communities. Horticulture, farming, fishing and tourism are highly dependent on weather. The accurate prediction of weather patterns and interpretation of weather forecasts are very important to our economy and lifestyle.

The *Weather in my world* unit is an ideal way to link science with literacy in the classroom. Students' beliefs and understandings about the air, Sun and wind will be developed as they work through hands-on activities. Through investigations, they will increase their knowledge of how the characteristics of weather affect their daily lives.

Australian Academy of Science

Published by the Australian Academy of Science.

GPO Box 783
Canberra ACT 2601
Telephone: (02) 9386 4544
Fax: (02) 9387 7755
Email: pc@science.org.au
www.primaryconnections.org.au

Typesetter: Sharyn Raggett
Font: Helvetica Neue, DIN
Print house: Daniels Printing Craftsmen
Cover images: Stock.xchng. www.sxc.hu

ISBN 978 0 85847 307 2

Acknowledgments

Primary**Connections** is supported by the Australian Government.

Thanks to the trial teachers and students of the trial schools Australia-wide and Fellows of the Australian Academy of Science who contributed to this unit.

Contents

Foreword

The Australian Academy of Science is proud of its long tradition of supporting and informing science education in Australia. 'Primary**Connections**: 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 Primary**Connections** 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. Primary**Connections** 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. Primary**Connections** 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 Primary**Connections** website (www.primaryconnections.org.au).

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 Primary**Connections** prepares students to participate in evidence-based discussions of these and other issues.

Primary**Connections** 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 science 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 Primary**Connections** to you and wish you well in your teaching.

Professor Suzanne Cory, AC PresAA FRS
President
Australian Academy of Science
2010–2013

The Primary**Connections 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.primaryconnections.org.au).

The Primary**Connections 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.primaryconnections.org.au

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 [PISA & OECD], 2009).

Linking science with literacy

Primary**Connections** 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.

Primary**Connections** develops the literacies of science that students need to learn and to represent their understanding of science concepts, processes and skills. Representations in Primary**Connections** 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, 2014) is ongoing and embedded in Primary**Connections** 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, 2014).

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

AC 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

Weather in my world

Phase	Lesson	At a glance
ENGAGE	**Lesson 1** Wondering about the weather	To capture students' interest and find out what they think they know about how daily and seasonal changes in our environment, including the weather, affect daily life To elicit students' questions about the weather and seasons
EXPLORE	**Lesson 2** Watching the weather ***Session 1*** Drawing weather symbols ***Session 2*** Weather symbol detectives ***Session 3*** Weather watchers (an ongoing experience)	To provide students with hands-on, shared experiences of symbols used to communicate weather conditions To commence an ongoing weather watch observation and recording experience
	Lesson 3 Eye to the sky	To provide students with hands-on, shared experiences of observing and describing clouds
	Lesson 4 What's the weather like today? ***Session 1*** How does it feel? ***Session 2*** A temperature tool	To provide students with hands-on, shared experiences of temperature
EXPLAIN	**Lesson 5** My weather book	To support students to represent and explain their understanding of weather and seasons, to identify suitable clothes and activities for various weather and seasonal conditions, and to introduce current scientific views
ELABORATE	**Lesson 6** Investigating the wind ***Session 1*** Moving materials ***Session 2*** Using wind meters	To support students to plan and conduct an investigation of wind strength
EVALUATE	**Lesson 7** Weather reporters	To provide opportunities for students to represent what they know about how daily and seasonal changes in our environment, including the weather, affect daily life, and to reflect on their learning during the unit

A unit overview can be found in Appendix 6, page 73.

Alignment with the Australian Curriculum: Science

This *Weather in my world* 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.

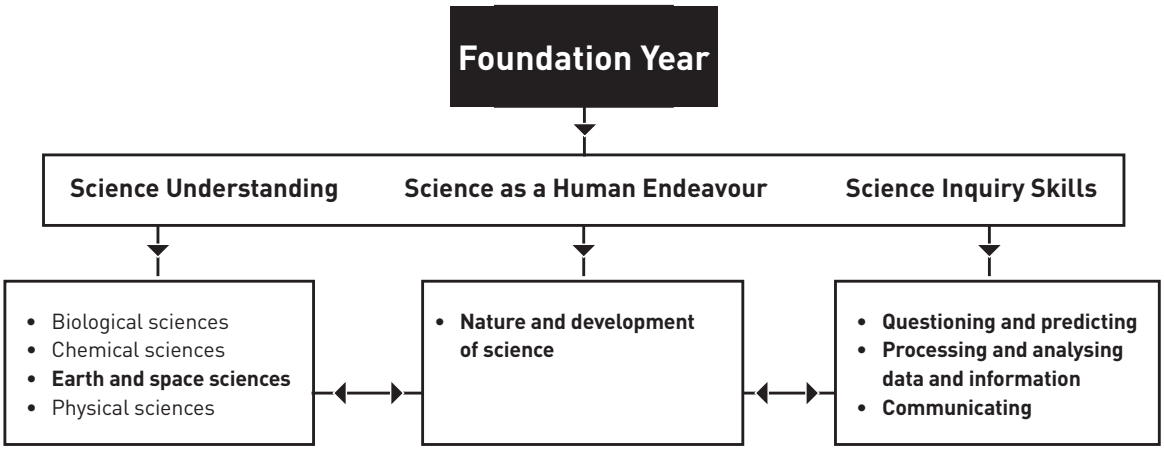
For ease of assessment the table below outlines the sub-strands and their aligned lessons.

Strand	Sub-strand	Code	Foundation Year content descriptions	Lessons
Science Understanding (SU)	**Earth and space sciences**	ACSU004	Daily and seasonal changes in our environment, including the weather, affect daily life	1–7
Science as a Human Endeavour (SHE)	**Nature and development of science**	ACSHE013	Science involves exploring and observing the world using the senses	1,2,3,4,6
Science Inquiry Skills (SIS)	**Questioning and predicting**	ACSIS014	Respond to questions about familiar objects and events	1,2,4,5,6,7
	Planning and conducting	ACSIS011	Explore and make observations by using the senses	1,3,4,6
	Processing and analysing data and information	ACSIS233	Engage in discussions about observations and use methods such as drawing to represent ideas	1–7
	Communicating	ACSIS012	Share observations and ideas	1–7

AC 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.



AC 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 *Weather in my world* these overarching ideas are represented by:

Overarching idea	Incorporation in *Weather in my world*
Patterns, order and organisation	Students describe the characteristics of weather. They record weather observations and compare how the daily and seasonal patterns affect what they wear and do.
Form and function	Students observe and explore the characteristics of weather and their role in daily weather patterns.
Stability and change	Students explore the characteristics of weather (temperature, wind, precipitation, clouds) and the similarities and differences in these over different timescales.
Scale and measurement	Students use simple, informal measurement scales employing relative language from their everyday experiences, such as hot, warm, cool, cold, none, gentle, and strong, to describe their observations of the weather.
Matter and energy	Through direct experiences and observations, students explore the role of energy in changes in weather characteristics, such as strong and gentle, heavy and light, fast and slow.
Systems	Students observe and describe the characteristics of weather as parts of the weather system.

Curriculum focus

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

Curriculum focus F–2	Incorporation in *Weather in my world*
Awareness of self and the local world	Students observe and explore patterns in daily and seasonal changes in the environment and the effect on everyday life. They link the changes in the daily weather to the way they modify their behaviour and dress for different conditions.

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 from the ACARA website.

By the end of the 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.primaryconnections.org.au).

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 units. For unit-specific information see the next page. For further information see: www.australiancurriculum.edu.au

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

Weather in my world—Australian Curriculum general capabilities

General capabilities	Australian Curriculum description	*Weather in my world* examples
Literacy	Literacy knowledge specific to the study of science develops along with scientific understanding and skills. 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.	In *Weather in my world* the literacy focuses are: • word walls • science journals • drawings • tables • factual recounts • factual texts.
Numeracy	Elements of numeracy are particularly evident in Science Inquiry Skills. These include practical measurement and the collection, representation and interpretation of data.	Students: • sort and classify weather symbols • use whole numbers and counting • collect and represent data and draw conclusions from daily weather watch activities.
Information and communication technology (ICT) competence	ICT competence is particularly evident in Science Inquiry Skills. Students use digital technologies to investigate, create, communicate, and share ideas and results.	Students are given optional opportunities to: • share information on an interactive board for weather watch recording table • generate digital photos of cloud cover or use photos to create a recount of wind strength investigation.
Critical and creative thinking	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.	Students: • explore, clarify and summarise ideas about weather • use reasoning to formulate questions and to select suitable materials for the wind investigation • reflect on their learning for the unit.
Ethical behaviour	Students develop ethical behaviour as they explore ethical principles and guidelines in gathering evidence and consider the ethical implications of their investigations on others and the environment.	Students: • ask questions respecting each other's point of view • show respect for others.
Personal and social competence	Students develop personal and social competence as they learn to work effectively in teams, develop collaborative methods of inquiry, work safely, and use their scientific knowledge to make informed choices.	Students: • work collaboratively in teams • listen to and follow safety instructions when handling materials • participate in discussions.
Intercultural understanding	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.	• 'Cultural perspectives' opportunities are highlighted where relevant • Important contributions made to science by people from a range of cultures are highlighted where relevant.

AC 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.

For further information see: www.australiancurriculum.edu.au

Aboriginal and Torres Strait Islander histories and cultures

The Primary**Connections** Indigenous perspectives framework supports teachers' implementation of Aboriginal and Torres Strait Islander histories and cultures in science. The framework can be accessed at: www.primaryconnections.org.au

Weather in my world focuses on the Western science way of making evidence-based claims about daily and seasonal changes, including the weather, in our environment.

Aboriginal and Torres Strait Islander Peoples might have other explanations for the observed phenomenon of daily and seasonal weather changes.

Primary**Connections** recommends working with Aboriginal and Torres Strait Islander community members to access local and relevant cultural perspectives. Protocols for engaging with Aboriginal and Torres Strait Islander community members are provided in state and territory guidelines. Links to these are provided on the Primary**Connections** website.

Sustainability

The *Weather in my world* unit provides an authentic context to explore, investigate and understand the students' local weather system. Students investigate the relationship between components of the weather system—the air, Sun and wind—and develop an appreciation for the interconnectedness of these components. This can assist them to develop the knowledge, skills and values necessary for people to act in ways that contribute to more sustainable patterns of living.

Alignment with the Australian Curriculum: English and Mathematics

Strand	Sub-strand	Code	Foundation Year content descriptions	Lessons
English–Language	**Language for interaction**	ACELA1428	Explore how language is used differently at home and school depending on the relationships between people	1–7
		ACELA1429	Understand that language can be used to explore ways of expressing needs, likes and dislikes	4
	Text structure and organisation	ACELA1430	Understand that texts can take many forms, can be very short (for example an exit sign) or quite long (for example an information book or a film) and that stories and informative texts have different purposes	2,5,6,7
	Expressing and developing ideas	ACELA1434	Recognise that texts are made up of words and groups of words that make meaning	2,5,6,7
		ACELA1437	Understand the use of vocabulary in familiar contexts related to everyday experiences, personal interests and topics taught at school	1–7
English–Literature	**Examining literature**	ACELT1578	Identify some features of texts including events and characters and retell events from a text	1,5
English–Literacy	**Text in context**	ACELY1645	Identify some familiar texts and the contexts in which they are used	2
	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	7
	Creating texts	ACELY1651	Create short texts to explore, record and report ideas and events using familiar words and beginning writing knowledge	1,3,5,7

Strand	Sub-strand	Code	Foundation Year content descriptions	Lessons
Mathematics–Number and Algebra	**Number and place value**	ACMNA001	Establish understanding of the language and processes of counting by naming numbers in sequences, initially to and from 20, moving from any starting point	2,3,4,5,6,7
	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	2
Mathematics–Measurement and Geometry	**Using units of measurement**	ACMMG007	Compare and order the duration of events using the everyday language of time	2,3,4,5,6,7
		ACMMG008	Connect days of the week to familiar events and actions	2,3,4,5,6,7
Mathematics–Statistics and Probablility	**Data representation and interpretation**	ACMSP011	Answer yes/no questions to collect information	2,5

AC 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.primaryconnections.org.au).

Teacher background information

Introduction to weather

The term 'weather' refers to the local, short-term characteristics of the atmosphere of a particular place. Weather events occur regularly on Earth and include wind, rain, thunderstorms, hail, snow and fog. These events are the result of different masses of air coming together. When air masses meet, differences in temperature, pressure and the amount of moisture in the air might lead to the formation of clouds and precipitation in the form of rain, hail or snow.

Weather conditions, such as temperature, cloud cover, humidity, visibility, rainfall and the speed and direction of wind can change suddenly. These conditions can be observed and measured with a range of instruments. Average weather conditions tell us about the climate of a particular place.

The term 'climate' refers to the long-term or prevailing weather conditions in a particular place. For example, a desert location that has no rain for most of the year might be described as having an arid (dry) climate, even if the weather on a certain day is wet or rainy. To know about the climate of a particular place, we have to observe and record the weather over a long period of time; this gives us an idea of the most common weather conditions, and what to expect in the future. The science of studying the atmosphere and predicting the weather is known as meteorology.

Students' conceptions

Taking account of students' existing ideas is important in planning effective teaching approaches that 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.

Some conceptions about 'weather' that students might believe but that are not scientifically correct are that weather is constant within the day; rain is associated with God crying, a tap turned on in the clouds or the clouds starting to sweat; when water evaporates from, for example, a wet playground, it 'disappears'; condensation, for example, on a cold glass, is water 'appearing' or coming from the onside of the glass; clouds and rain are made by God; clouds are made of cotton, stones, Earth, smoke or steam; clouds are made of cold, heat, fog, snow or night; clouds are sponges that hold water; weather is the same as climate; and clouds move because they are pushed by humans.

References

Skamp, K. (Ed.) (2004). *Teaching primary science constructively*. Southbank, Victoria: Thomson Learning Australia. pp. 437–441.

To access more in-depth science information in the form of text, diagrams and animations, refer to the Primary**Connections** Science Background Resource which has now been loaded on the Primary**Connections** website (www.primaryconnections.org.au).

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

Lesson 1 Wondering about the weather

AT A GLANCE

To capture students' interest and find out what they think they know about how daily and seasonal changes in our environment, including the weather, affect daily life.

To elicit students' questions about the weather and seasons.

Students:

- experience the weather outside the classroom
- represent their ideas about weather through drawing
- share ideas and questions about weather.

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 how:

- daily and seasonal changes in our environment, including the weather, affect daily life.

Key lesson outcomes

Science

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

- observe characteristics of weather
- identify some characteristics of weather
- recall characteristics of weather and record them as drawings.

Literacy

Students will be able to:

- contribute to discussions about weather
- recount their personal experiences of weather
- record ideas in a science journal.

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

FOR EACH STUDENT

- frame (eg, cut from ice-cream container lid, cardboard)
- student science journal

Preparation

- Read 'How to write a science journal' (Appendix 2).
- Read 'How to use a word wall' (Appendix 3).
- Prepare the class science journal with a 'Weather in my world' title page, a page with the title 'What we think we know about weather' and a page with the title 'What we want to learn about weather'.

Looking directly at the Sun can cause permanent eye damage. In rare cases this can occur without any pain. Warn students against looking directly at the Sun at any time.

Lesson steps

1. Explain that the class is going to go for a walk to look at the weather. Brainstorm students' ideas about what to look out for when they are observing the weather.
2. Go for a walk outside the classroom and find a suitable place to sit down.

3. Ask students to close their eyes. Ask them to think about how their skin feels in the open air. Focus on responses, such as hot, sticky, cold.
4. Provide each student with a frame, or ask them to form a frame with their hands and fingers.

Student using frame cut from an ice-cream container lid

Direct students to use their frames to focus on specific areas of the environment, such as the sky, clouds or any things that might be moving with the wind. Ask students to describe what they see at each focal point, and draw out words describing the weather. Record words onto cards for the word wall.

Discuss the purpose and features of a word wall.

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 spelled.

What does a word wall include?

A **word wall** includes a topic title or picture and words that we have seen or heard about the topic.

5 Return to the classroom and explain that students are going to draw what they know about the weather. Explain that this might be about the weather they observed while outside or other weather they have experienced in different seasons.

6 Ask students to draw what they know about daily and seansonal weather in their science journal.

Discuss the purpose and features of a science journal.

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** includes dates and times. It might include written text, drawings, measurements, labelled diagrams, photographs, tables and graphs.

Arrange for students to write (or for you to scribe) descriptions of the weather next to their pictures.

7 Provide students with time to share their drawings with the class, and record their information about the weather on the class science journal page 'What we think we know about weather'. Where possible, when recording students' information in the class science journal, use language such as 'can be' rather than 'it is' to reinforce the idea that weather can vary. For example:

Student: In my picture, it is sunny.

Recorded note: The weather can be sunny.

8 Model and discuss the difference between making a statement and asking questions. Introduce the title 'What we want to learn about weather' in the class science journal. Model asking and recording questions about the weather, such as:

- What types of weather do we have?
- Is the weather always the same?
- What can we find out about the weather?
- What are the seasons? What is the weather like each season?
- How does the weather affect what you wear or do?

Ask students to share questions they might have about the weather or seasonal changes and record them in the class science journal.

Refer to this question page after each lesson to see if any of the questions have been explored or answered through the activities and investigations in the unit, and to elicit and record further student questions about the weather.

Curriculum links

English

- Share nursery rhymes, poems and stories about the weather. Share folk tales about the weather.

The Arts

- Sing songs about the weather, such as *Rain is falling down* and *One rainy morning*.

Indigenous perspectives

Through thousands of years of observation, Indigenous culture has developed a deep understanding of environmental indicators to predict weather patterns. Some Indigenous people use their own seasonal calendars based on knowledge of the sequence of events in their local environment. This understanding can be important for knowing what food is available at different times of the year.

- View the Nunggubuyu people's 'Everything has a cycle' clip at: www.australianscreen.com.au/titles/5-seasons/clip1/ or the 12 Canoes 'Seasons' clip at: www.12canoes.com.au
- Indigenous people might have their own way of understanding the world around them (see page 6). Contact local Indigenous community members and/or Indigenous Education Officers to access relevant, local Indigenous knowledge. Protocols are available on the website (www.primaryconnections.org.au).

Lesson 2 Watching the weather

AT A GLANCE

To provide students with hands-on, shared experiences of symbols used to communicate weather conditions.

To commence an ongoing weather watch observation and recording experience.

Session 1 Drawing weather symbols

Students:

- discuss how symbols are used to communicate information
- create symbols that represent characteristics of weather.

Session 2 Weather symbol detectives

Students:

- explore symbols used in newspaper and television weather information reports
- discuss why people want to know about the weather.

Session 3 Weather watchers (an ongoing experience)

Students:

- participate in ongoing observation, recording and discussion of daily weather conditions.

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:

- changes in the weather affect daily life.

You will also monitor their developing science inquiry skills (see page 3).

Key lesson outcomes

Science

Students will be able to:

- identify some characteristics of weather
- identify symbols used to represent characteristics of weather
- observe and record characteristics of weather.

Literacy

Students will be able to:

- recognise symbols and words used to describe weather
- view newspaper and television weather reports and make links with their personal experience
- recount their personal experience of weather
- identify the broad purposes and features of a table
- retrieve information from a weather recording table created as a class
- share in writing a summary of the day's weather.

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

Teacher background information

Weather influences the decisions we make each day about the clothes we wear and the activities we engage in. It also affects industries, such as horticulture, farming, fishing and tourism. Predicting long-term patterns of drought, flood and rainfall is very important to our economy and lifestyle, especially in Australia, the driest inhabited continent on Earth.

Weather forecasts provide us with a range of information to help us plan our daily lives, and sometimes warn us of danger from extreme weather conditions. For people living in areas prone to storms, cyclones or floods, knowledge of the weather can mean the difference between life and death.

A very important part of meteorology (the science of studying the atmosphere and predicting the weather) is recording atmospheric data over long periods. Meteorologists use this data to detect patterns in the weather and climate trends. Long-term records not only enable scientists to know about the past, but also help them to better predict weather patterns in the future.

Meteorologists use a wide variety of instruments for observing the weather, including:

- thermometers to measure air temperature
- barometers to measure air pressure
- anemometers to measure wind speed
- hygrometers to measure air humidity (how much moisture (water vapour) is in the air)
- weather radars to detect approaching rainfall
- weather satellites to monitor cloud cover, surface temperatures of land and sea and other data about the atmosphere.

Powerful supercomputers enable meteorologists to predict the weather. These computers help to analyse the enormous quantity of data meteorologists collect about temperature, pressure and wind speeds at many locations.

Session 1 Drawing weather symbols

Equipment

FOR THE CLASS

- class science journal
- word wall
- 'Symbols in my world' (Resource sheet 1)
- *optional:* photographs of symbols used in everyday life
- *optional:* you might like to use weather sound clips for this activity (see the Primary**Connections** website)
- *optional:* computer and appropriate software for students to draw symbols

FOR EACH STUDENT

- student science journal
- 4 small pieces of paper (approximately 8 cm x 8 cm)

Preparation

- *Optional:* Organise photographs of symbols used in your school or local environment.

Lesson steps

1 Show examples of symbols, for example, 'Symbols in my world' (Resource sheet 1) and explain that information can be represented in pictorial form. Discuss examples of symbols students have seen.

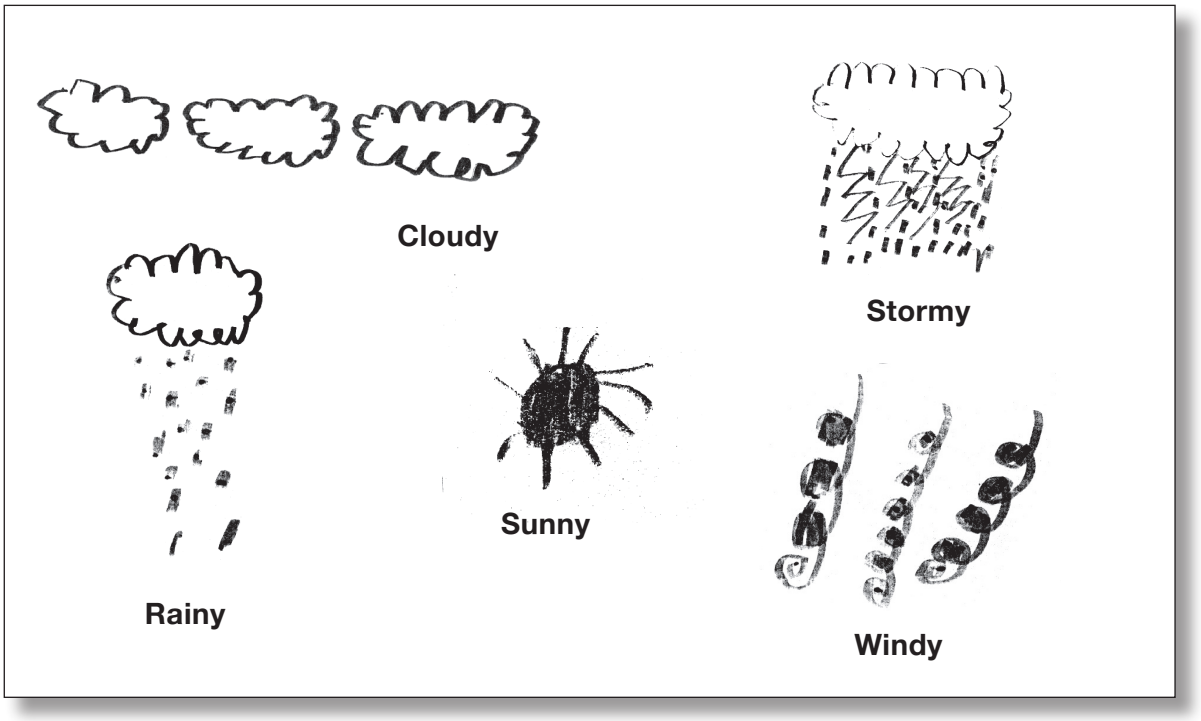
Optional: A computer with projector or interactive whiteboard could be used to reinforce students' understanding of symbols by looking at the icons on computer desktops or in computer programs they have used.

Talk about what the symbols mean and what their purpose is. Ask questions, such as:

- Why do we need these symbols?
- How are these symbols helpful?

2 Explain that symbols are often used to represent weather conditions. Recall the discussion about 'What we think we know about weather' from the previous lesson, and brainstorm the words used to describe different types of weather. For example, 'In winter the weather might be rainy, snowy, frosty, cloudy, sunny, stormy, windy'. Or, 'In the Wet season the weather might be rainy, humid and stormy'. Record new words on cards for the word wall.

3 Explain that students are going to draw symbols for different types of weather. Provide them with four small pieces of paper, explaining that their task is to draw one symbol on each piece of paper.



Work samples of weather symbols

Optional: Ask all students to draw symbols for the same types of weather or to select their own four symbols to draw from the weather types on the word wall.

Discuss the purpose and features of a drawing.

Literacy focus

Why do we use a drawing?

We use a **drawing** to illustrate an idea or an object.

What does a drawing include?

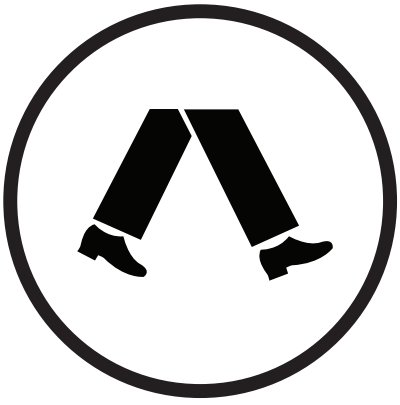
A **drawing** includes lines to represent a likeness, image, plan or design, usually using a pen, pencil or crayon.

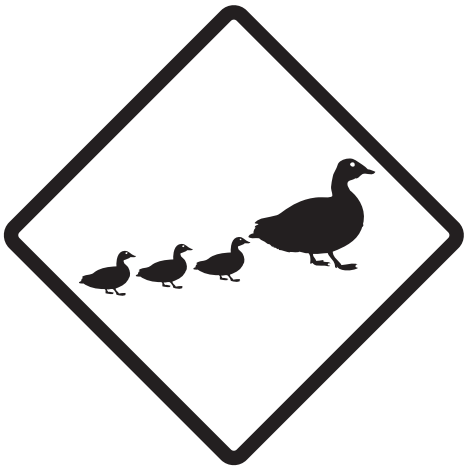
4 Ask students to form a sharing circle. Place weather words from the word wall in the centre of the circle and ask a few students at a time to match their symbols with the words/symbols on the floor. Discuss the similarities and differences in the symbols students have drawn. Group the words in seasons that match the local area.

5 Organise students to paste their weather symbols into their science journals and label them.

Symbols in my world

Name: _____ **Date:** _____





 ISBN 978 0 85847 307 2

Session 2 Weather symbol detectives

Equipment

FOR THE CLASS

- class science journal
- word wall
- newspaper
- set of newspaper weather map symbols
- recording of a television weather report*
- audiovisual equipment (eg, television, DVD player)

FOR EACH STUDENT

- student science journal
- newspaper weather report (provided by you)
- scissors
- glue
- *optional:* computer/s with internet access to view online weather information at:
  www.bom.gov.au
  www.abc.net.au/news/weather

*** Disclaimer for Screenrights**
Under the *Australian Copyright Act*, in order to copy from television for educational purposes and to communicate those copies, your school or educational institute must have a Screenrights licence. All Australian Government and most Catholic and independent schools have a Screenrights licence. If you are not sure whether your school has a licence, please contact Screenrights at **licensing@screen.org** or phone (02) 9904 0133.

EXPLORE

Preparation

- Cut out weather information reports, including maps, from your local newspaper. Collect or make sufficient copies so each student has a report. (Use the section of the weather report that has symbols for weather, and remove features, such as isobars, highs, lows and hectopascals which will make the map too complex for Foundation Year students.) Where necessary, enlarge the reports so the weather symbols are large enough for students to cut out easily.
- Record a television weather report.

Lesson steps

1. Review the previous session and the role of symbols in our world. Explain that students are going to become weather symbol detectives and explore weather information reports to learn about the symbols used.
2. Introduce a newspaper and look through it with the class to locate the weather information report. Discuss what students see, with a focus on the use of symbols.
3. Explain that each student is going to have a copy of a newspaper weather report and that they will cut out the symbols and paste them into their science journals.
4. After students have pasted the newspaper weather symbols into their science journal, provide them with support to label the symbols by directing them to the word wall or scribing for them.

5 Lead a discussion about the similarities and differences between the symbols drawn by the students and those found in the newspaper.

6 Add symbols from the newspaper weather report to the word wall, together with the descriptive weather word.

7 Explain that students are going to view a different type of weather report. Ask them to listen and watch carefully because, after viewing the report, you will ask them to recall what they can remember about the types of weather reported. Show students the recorded television weather report. After viewing the report, ask students to tell you what they saw, such as maps, numbers, symbols.

8 Lead a discussion with questions, such as:

- Why do people want to know about the weather?
- What information do people want to get from weather reports?

9 Make connections to students' lives and the local context. Add any further vocabulary to the word wall. As a class, reflect on the words and symbols. Review the students' question page in the class science journal and add any new questions students might have.

Session 3 Weather watchers (an ongoing experience)

FOR THE CLASS

- class science journal
- word wall
- 'Weather symbols used by the Bureau of Meteorology' (Resource sheet 2)
- *optional:* weather symbols (The Primary**Connections** website has a larger range of symbols you can use)
- 1 enlarged copy of 'Weather watch' (Resource sheet 3) or similar (see 'Preparation')

Preparation

Note: This is designed as an ongoing activity that will develop as the unit progresses. While it is not necessary to observe and record weather twice a day for the duration of the unit, try to give students the opportunity to observe and record the weather twice a day at least one to two days a week. This will assist students to develop the idea that the weather can change not only from day to day, but also within a day.

- As the unit progresses, observations and recording of the weather will become more detailed as students learn about cloud cover, temperature and wind.
- Consider how you will organise this activity with your class. For example, the whole class observes the weather at two regularly timetabled periods each day. Students are

rostered to be weather recorders and record the appropriate symbol and vocabulary on the table. The daily review might be a way to finish each day, or it might be completed the following morning.

- Prepare a table to record the weather, for example, 'Weather watch' (Resource sheet 3) or similar:

Weather watch

Times	Monday	Tuesday	Wednesday	Thursday	Friday
Morning					
Afternoon					
Daily review					

- Prepare symbols for a weather watch recording table. You may collect a compilation of symbols drawn by the students in Session 1, those from your local newspaper, those on 'Weather symbols used by the Bureau of Meteorology' (Resource sheet 2) or ask students to draw symbols directly onto the recording table.
- If necessary, prepare copies of words to use on the weather chart, such as sunny, cloudy, rainy, stormy, frosty.

EXPLORE

Lesson steps

1 Review the weather information reports explored in the previous session. Explain that students are going to become 'weather watchers' and that the class will regularly observe the weather and compile its own weather report table.

2 Introduce the weather watch recording table and symbols that your class will be using. 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.

3 Explain how the 'Weather watchers' activity will be organised and model the first entry. Discuss the way the 'Daily review' section will recount what happened with the weather for each day. Discuss the purpose and features of a factual recount.

Literacy focus

Why do we use a factual recount?

We create a **factual recount** to describe things that have happened to us. We can read a **factual recount** to find out about things that have happened to someone else.

What does a factual recount include?

A **factual recount** might include descriptions of how the writer felt and other people who were part of the events. It is often written in past tense.

4 As you lead discussion about each day's weather and record the daily summary, discuss the types of clothing and activities that might be suitable for those particular weather conditions.

You might like to have dolls, for example, paper dolls, and a range of seasonal clothing and accessories, for example, umbrellas so students can adjust their clothing and accessories to suit daily weather conditions.

5 *Optional:* Students keep individual records in their science journals. Using a copy of the recording table they might use photocopied versions of the class weather symbols or draw their own.

Weather watch

Time	Monday	Tuesday	Wednesday	Thursday	Friday
Morning	 rainy				
Afternoon	 cloudy				
Daily review	Today was Monday. It was rainy in the morning. It stopped raining in the afternoon.				

Example of recording table for weather watch activity

Curriculum links

English

- Share weather-related traditional rhymes.

Mathematics

- Use a calendar to show the passage of time. Practise counting to 31 using a calendar.

Health and Physical Education

- Discuss your school's Sunsmart policy. Record and discuss daily UV readings (often found in newspapers).

The Arts

- Sing weather songs.

Information and Communication Technology (ICT)

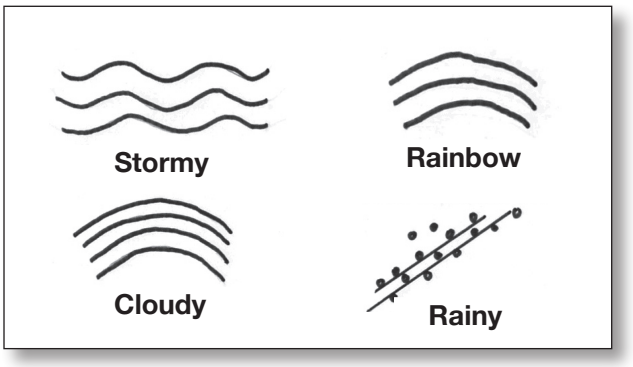
- Use an interactive whiteboard for the weather watch recording table. Use the internet to view weather information reports on online newspapers.

EXPLORE

Indigenous perspectives

Some Indigenous people use symbols in art to represent weather phenomena. There are some common symbols used in Indigenous art. Consult your local Indigenous community members for specific information for your area.

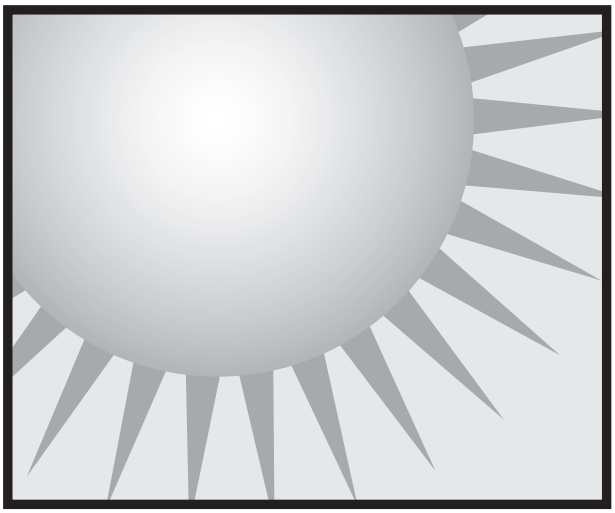
- Explore Indigenous symbols used for weather phenomena, such as rainbow, rain, cloud and lightning. See: www.aboriginalartonline.com/culture/symbols.php
  Use Indigenous symbols for weather phenomena on the 'Weather watch' table.
- Indigenous people might have their own way of understanding the world around them (see page 6). Contact local Indigenous community members and/or Indigenous Education Officers to access relevant, local Indigenous knowledge. Protocols are available on the website (www.primaryconnections.org.au).



Work sample of Indigenous weather symbols

Weather symbols used by the Bureau of Meteorology

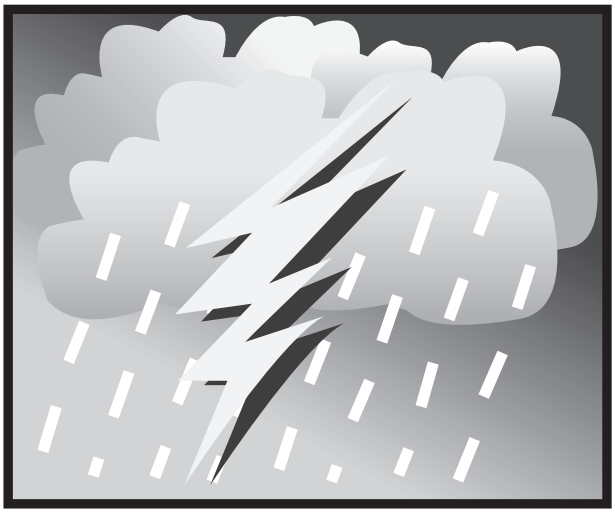
Name: _____ **Date:** _____



sunny

cloudy

rainy



stormy

 ISBN 978 0 85847 307 2

Weather watch

Week beginning Monday _____

Times	Monday	Tuesday	Wednesday	Thursday	Friday
Morning					
Afternoon					
Daily review					

Lesson 3 Eye to the sky

PrimaryConnection Linking science with literacy

EXPLORE

AT A GLANCE

To provide students with hands-on, shared experiences of observing and describing clouds.

Students:

- discuss their experiences of observing and recording the weather
- make observations of the sky
- discuss language used to describe the amount of cloud cover
- represent observations of cloud cover and label appropriately.

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:

- daily and seasonal changes in the weather affect daily life.

You will also monitor their developing science inquiry skills (see page 3).

Key lesson outcomes

Science

Students will be able to:

- use a frame to observe the sky
- identify clouds as a feature of the sky
- describe how much of the sky is covered by cloud.

Literacy

Students will be able to:

- use appropriate language to describe the amount of cloud cover
- participate in a discussion to recount observations and experiences relating to cloud cover and weather characteristics
- retrieve information from a table.

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

Teacher background information

Clouds are formed when warm moist air rises to where it is cooler and the pressure in the atmosphere is lower. As the warm moist air cools (all gases cool when they expand under low pressure), some of the water vapour in the air changes from a gas to a liquid (condenses), forming tiny water droplets. A mass of billions of these tiny suspended water droplets is visible as a cloud.

Rain develops when water droplets join together and become too heavy to be suspended in air currents and remain in the cloud. Gravity pulls the droplets towards the surface of the Earth, where they fall as precipitation.

When estimating cloud cover, meteorologists divide the sky into eighths. If they estimate that eight-eighths are covered by clouds, they describe the sky as having total cloud cover. If they estimate that zero parts are covered, they describe the sky as being clear. In weather forecasts, the terminology used is simpler: clear (no cloud), sunny (little chance of the Sun being obscured by cloud), cloudy (more cloud than clear sky) and overcast (total cloud cover).

Equipment

FOR THE CLASS

- class science journal
- word wall
- 'Weather watch' class table
- 'Eye to the sky' (Resource sheet 4)
- *optional:* photographs of the sky
- factual texts about the weather (see the Primary**Connections** website for suggestions)

FOR EACH STUDENT

- student science journal
- frame (from Lesson 1)

Preparation

- Prepare a cloud cover table in the class science journal, for example:

Cloud cover table

What the sky looks like (photo or drawing)	How much cloud cover	Science words

Lesson steps

1 Review the class's ongoing weather watch recording activity, and discuss what the class has observed and recorded about the weather.

2 Lead a discussion about how students know about the day's weather. Encourage them to consider that looking at the sky often helps us predict or know about the weather.

3 Introduce the idea that when observing the sky it is important to see as much of it as possible.

SAFETY

Looking directly at the Sun can cause permanent eye damage. In rare cases this might occur without any pain. Warn students against looking directly at the Sun at any time.

4 Take students outside to an open space and provide each student with a frame, as used in Lesson 1. Ask students to view and describe the sky by looking in front, to the right, to the left and behind. Through discussion, they might learn that the sky can look different from different directions.

5 Explain that by using these four views we build a picture of what the sky is really like and can more accurately describe the sky. Focus students' attention on words used to describe the sky and record their ideas, such as 'empty sky', 'blue sky', 'grey sky', 'lots of clouds', 'white clouds'.

6 Talk about how much cloud cover they think there is. You might like to introduce the scientific descriptions of cloud cover if you feel it is appropriate for your students: clear (no cloud), cloudy (more cloud than clear sky) and overcast (total cloud cover).

Note: The words 'clear', 'cloudy' and 'overcast' are more scientific descriptions of cloud cover. Some students might also make a connection between the amount of cloud cover in the sky and brightness.

7 Return to the classroom. Discuss and list observations in the class science journal.

8 Create a class table to describe different levels of cloud cover. Review the purpose and features of a table. Discuss the headings and what information will go into each column.

Cloud cover table

What the sky looks like	How much cloud cover	Science words
	No clouds in the sky	clear
	Some of the sky has clouds	cloudy
	All of the sky has clouds	overcast

Example of a completed cloud cover table

9 Ask students to use their science journals to draw a picture of the sky as they observed it and to write a caption (or for you to scribe) that describes the cloud cover.

10 As students investigate the characteristics of the weather, you might use simple factual texts to support them (see the PrimaryConnections website for suggestions). When doing so, talk about the purpose and features of the texts.

Literacy focus

Why do we use a factual text?

We use a **factual text** to inform, teach or persuade someone reading it. We can read a **factual text** to collect information.

What does a factual text include?

A **factual text** includes a title, text and pictures. It might include labels, diagrams, maps and photographs.

11 Add new vocabulary to the word wall. If possible, include photographs of the sky as a cue for students reading the words. Review the question page in the class science journal.

Weather watchers (an ongoing experience)

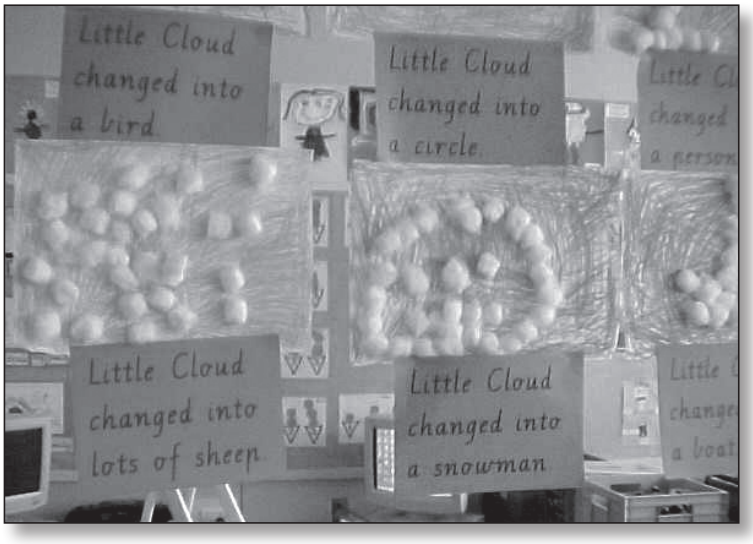
From this point, when observing and recording daily weather for the 'Weather watch' class table, highlight details about the amount of cloud cover using scientific language where appropriate.

Remember to discuss clothing and activities that might be suited to the season and the particular type of weather conditions.

Curriculum links

The Arts

- Students observe cloud movement and shapes, and create an artwork to show what they have seen and imagined. Students can describe their cloud pictures orally or in writing.
- Move imaginatively to music, using scarves or bodies to represent clouds.



Work samples of cloud artworks

Information and Communication Technology (ICT)

- Take digital photos of cloud cover to include on the weather watch.

Eye to the sky

Clear sky

Cloudy sky

Overcast sky

 ISBN 978 0 85847 307 2

Lesson 4 What's the weather like today?

AT A GLANCE

To provide students with hands-on, shared experiences of temperature.

Session 1 How does it feel?

Students:

- discuss their experiences of observing and recording the weather
- recall language about temperature
- describe how the air feels
- investigate temperature.

Session 2 A temperature tool

Students:

- observe and experience the weather while outside
- explore the term 'temperature'
- make a descriptive temperature scale that uses words and colours.

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:

- daily and seasonal changes in the weather affect daily life.

You will also monitor their developing science inquiry skills (see page 3).

Key lesson outcomes

Science

Students will be able to:

- identify that temperature is a distinctive characteristic of the weather
- use a scale to describe temperature conditions
- identify that thermometers can be used to measure temperature.

Literacy

Students will be able to:

- use talk to report on observations and reflect on their experience of temperature
- physically represent their understanding on a simple temperature scale
- follow instructions to make a temperature tool
- use a simple temperature scale to describe temperature.

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

Teacher background information

Temperature is the degree of hotness. It is a measure of the intensity of heat rather than the amount of heat. When meteorologists discuss temperature, they are specifically referring to air temperature.

There are three temperature scales used to accurately measure and describe temperature. Australia and most other countries use the Celsius (sometimes called centigrade) scale. In this scale, zero degrees Celsius (0ºC) is the freezing point of water, and 100 degrees Celsius (100ºC) is the boiling point of water. Points below freezing are quoted as negative numbers.

In the Fahrenheit scale (still used in the United States), 32 degrees Fahrenheit is the freezing point of water and 212 degrees Fahrenheit is the boiling point of water.

In the Kelvin (also known as the 'absolute') scale, zero degrees is 'absolute zero', which is the point at which there is no heat whatsoever in the object being measured and that is as low as temperature can get. In this scale, 273 degrees Kelvin is the freezing point of water and 373 degrees Kelvin is the boiling point. There are no negative absolute temperatures.

The Kelvin scale is most often used by physicists and chemists because certain relationships are simpler to describe when absolute temperature is used. The Celsius and Fahrenheit scales are commonly used to measure everyday temperature.

Session 1 How does it feel?

Equipment

FOR THE CLASS

- class science journal
- word wall
- 'Weather watch' class table
- 1 source of warm or hot air (eg, a hair dryer, a blow heater)
- 1 source of cold air (eg, a freezer, a refrigerator, an air conditioner, a fan)
- 4 A3 sheets of paper
- self-adhesive notes or strips of paper
- *optional:* bucket of ice cubes

FOR EACH STUDENT

- 1 fan (made from paper or card) or piece of paper

Preparation

- Prepare the A3 pieces of paper with the titles of the four different temperature experiences you will be using, such as 'mouth blowing air', 'blow/fan heater', 'paper fan' and 'air conditioner'.
- *Optional:* If using an electric fan for students to experience cold air, consider placing a bucket of ice cubes in front of the fan to further decrease the air temperature.

Lesson steps

Note: The word 'temperature' is introduced in the second session of this lesson. At this stage, focus descriptions around 'How does it feel?', concentrating on temperature.

1 Review the class's ongoing weather watch recording activity and discuss what the class has observed and recorded about the weather.

2 Recall the language about temperature that students have used in previous discussions about the weather, and when observing and recording for the weather watch activity. For example:

- Do you remember when Aden said that it was cold this morning?
- Do you remember when Sascha told us it was hot after lunch on Monday?

3 Link the idea that we use words to describe what the air feels like to us and how it makes our bodies feel, such as cold, hot. Brainstorm words that students use or have heard used to describe how the air feels.

4 Explain that students are going to investigate some different types of air to find out what it feels like.

5 Ask students to blow on their hand and share descriptions (adjectives) of how the air feels.

Record responses on the appropriate A3 sheet. Using self-adhesive notes will enable you to move the words later.

6 Organise students to walk past a source of warm or hot air.

SAFETY

Take care when using electrical sources of hot air. Station yourself or another adult with the heat source.

Share and record descriptions of how the air feels in the class science journal.

7 Provide each student with a paper fan or piece of card. Ask students to fan themselves, and share and record descriptions of how it feels.

8 Organise students to walk past a source of cold air, and share and record descriptions of how it feels.

9 Review the descriptions recorded under each title and move any of the words that the students think would be more appropriately placed on a different page.

10 As a class, order the experiences from hottest to coldest. Number them in the class science journal.

11 Conclude the lesson by adding relevant vocabulary to the word wall.

EXPLORE

Session 2 A temperature tool

Equipment

FOR THE CLASS

- class science journal
- word wall
- 'Weather watch' class table
- string or chalk to mark physical temperature scale
- 4 A4 sheets of card
- 1 enlarged copy of 'Our temperature tool' (Resource sheet 5)
- different types of thermometers, (eg, colour-band, alcohol and digital thermometers)

FOR EACH STUDENT

- 1 copy of 'Our temperature tool' (Resource sheet 5) on A4 thin card
- coloured pencils, including red and blue
- scissors
- 1 peg or large paper clip

Preparation

- Write the words 'hot', 'warm', 'cool' and 'cold' on the A4 cards.

Lesson steps

1 Review the language students used in the previous session. Ask them to look out the window and then ask what the air might feel like if they went outside. Encourage students to provide a reason for their answer, for example, 'It is sunny so it is hot'.

2 Ask students to suggest how they could test their predictions, for example, by taking a walk outside. Go for a walk outside and lead a discussion about students' observations. Challenge them to provide reasons for their ideas, for example:

- Why do you think it is hot?
- What do you think is making it cold?

3 Make a line with string or chalk to create a physical temperature scale. Ask a student to hold the 'hot' card and stand at one end of the line, while another student with the 'cold' card stands at the other end. Ask the rest of the students to stand on the line where they think it best describes the current temperature.

Ask students to give reasons why they chose to stand at that point, for example, 'I feel cold because there's a cold wind out here' or 'I feel hot because the Sun is hot'.

Introduce possible weather scenarios, asking students to place themselves on the scale according to how they imagine they would feel. Ask them to provide reasons.

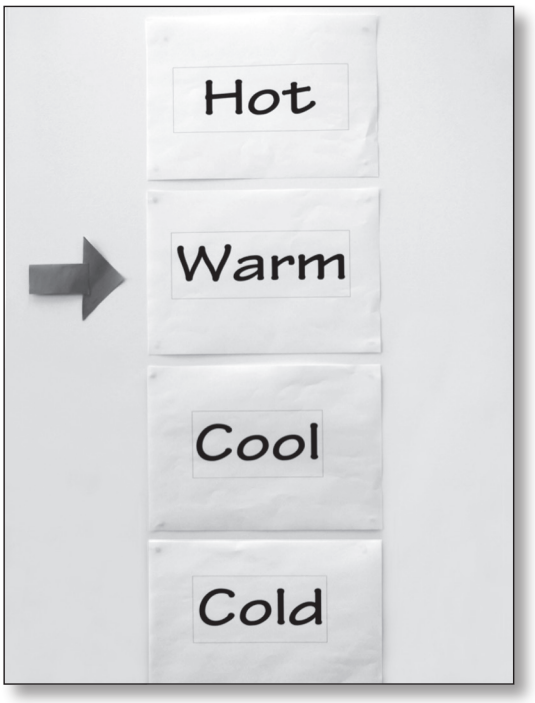
(Some possible scenarios might be at night, in different weather conditions or in a different season.)

4 Discuss the words used on the scale: 'hot' and 'cold'. Ask students for words that could go between hot and cold. Place the cards with the words 'warm' and 'cool' on the scale.

Introduce the word 'temperature' as a way of describing how hot it is.

5 Return to the classroom and review the language recorded from Session 1.

Ask students which words they would use to describe the outside temperature today.



Describing the day's temperature

EXPLORE

6 Lead a discussion about the different ways students might have seen temperature being measured, such as when they have been sick, using a thermometer at home or school.

7 Explain that students are going to make their own tool for recording the temperature.

8 Introduce the enlarged copy of 'Our temperature tool' (Resource sheet 5) to show that there are four temperature words on the right-hand side.

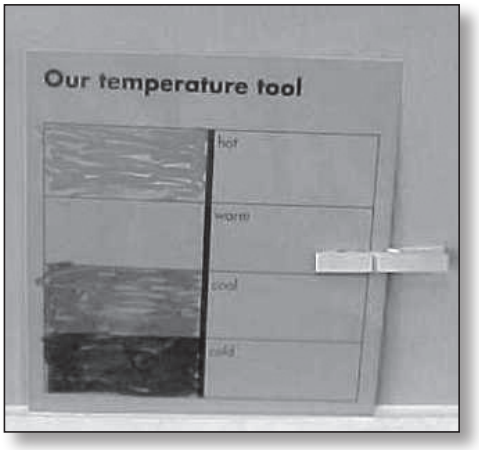
9 Ask the students how colours are used to show hot and cold, for example, on hot taps and cold taps. Ask students to colour the boxes with the temperature words in them using appropriate colours.

In the boxes on the left-hand side, ask students to draw pictures of activities and/or clothing suitable for the four temperatures.

10 After students have completed colouring and drawing, ask them to cut around the shape. Provide each student with a peg or large paper clip to slide up and down to mark the temperature.

11 Use the tool to describe the day's temperature. Students can also use the temperature tool to demonstrate some of the possible weather scenario temperatures they enacted in the physical scale activity they did outside in steps 3 and 4 of this session.

12 Explain that this is a type of thermometer, with colours and words to describe the temperature. If possible, show students different types of thermometers, such as colour-band, alcohol and digital thermometers.



Work sample of temperature tool

13 Lead a discussion about how temperature can affect what activities we can do, the food we eat and the clothes we wear. Refer to the discussions you have had as you have completed the ongoing weather watch observing and recording activity.

Provide students with examples of activities, food and clothing and ask them to use their temperature tools to show the temperature best suited to the example, using questions, such as:

- What would be a suitable temperature for wearing gloves?
- What would be a suitable temperature for going swimming outside?

Discuss students' suggestions and reasons.

14 Add new vocabulary with a diagram or photograph of a thermometer to the word wall (using colour for the words).

15 *Optional:* Ask students to draw or find magazine pictures, such as food, clothing or activities that can be used to illustrate what they eat, do or wear at different temperatures. Put up two sheets of paper titled 'hot' and 'cold' and ask the students to paste their pictures under the appropriate title.

Weather watchers (an ongoing experience)

From this point, when observing and recording daily weather for the 'Weather watch' class table, highlight details about temperature explored in this lesson.

Remember to discuss clothing and activities that might be suited to the particular type of weather conditions.

Curriculum links

Mathematics

- Explore different air temperatures using thermometers.

Information and Communication Technology (ICT)

- Use computer applications to create or locate pictures that illustrate different temperatures. Take digital photographs of students to show what they are wearing or doing to suit the day's temperature for the weather watch observation and recording activity.

Indigenous perspectives

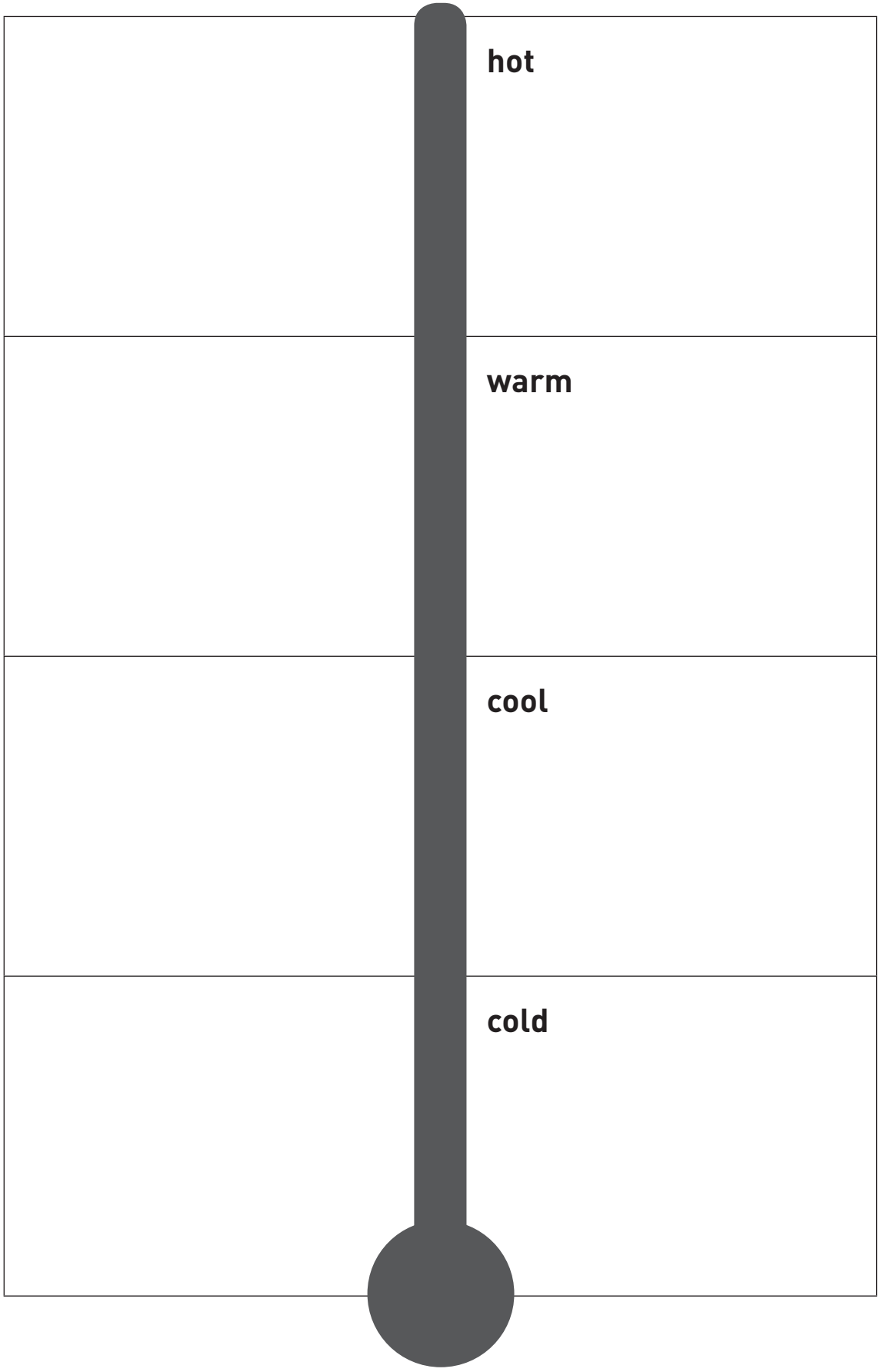
Indigenous seasons are based on observations of the environment over thousands of years. They often have more than the four seasons—summer, autumn, winter, spring—that are described in southern areas of Australia or the two seasons—wet and dry—described in the tropics.

- Explore how Indigenous seasons are organised, for example, seasons are often depicted in a circle and focus on environmental indicators, such as the presence of particular plants or animals rather than specific dates. See: www.bom.gov.au/iwk/climate_culture/Indig_seasons.shtml http://livingknowledge.anu.edu.au/learningsites/seacountry/10_observing.htm and www.abc.net.au/science/features/indigenous
- Explore the Noongar six seasons (Southwest Western Australia). See www.det.wa.gov.au/education/abled/apac/lessons/pdfs/apac115.pdf

Indigenous people might have their own way of understanding the world around them (see page 6). Contact local Indigenous community members and/or Indigenous Education Officers to access relevant, local Indigenous knowledge. Protocols are available on the website (www.primaryconnections.org.au).

Our temperature tool

Name: _____ **Date:** _____



Lesson 5 My weather book

AT A GLANCE

To support students to represent and explain their understanding of weather and seasons, to identify suitable clothes and activities for various weather and seasonal conditions, and to introduce current scientific views.

Students:

- review the 'Weather watch' class table, word wall and class science journal
- discuss observations of weather
- represent observations of weather and identify clothes and activities suitable for various weather conditions.

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 ongoing aspect of the *Explain* 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:

- daily and seasonal changes in the weather affect daily life.

You are also able to look for evidence in students' drawings and oral language to represent what they know about daily and seasonal changes in the weather, and to give students feedback about how they can improve their representations.

Key lesson outcomes

Science

Students will be able to:

- identify that weather has distinctive characteristics (cloud cover, temperature, wind and rain)
- identify that weather changes over time
- review and summarise records of weather observations.

Literacy

Students will be able to:

- clarify their understanding and reflect on their experience of observing and recording the weather
- construct and retell meanings from a weather recording table
- write and illustrate simple descriptions of weather characteristics.

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
- 'Weather watch' class table
- factual texts about the weather (see the Primary**Connections** website for suggestions)

FOR EACH STUDENT

- a book (eg, made from several copies of 'Weather and me' (Resource sheet 6) or similar)
- *optional:* copies of weather symbols

Preparation

- Prepare the class science journal with a page titled 'What we have learned about weather'.
- Copy and staple sheets of paper, for example, copies of 'Weather and me' (Resource sheet 6), together with a title page to make each student a book.
- Consider how you will organise this activity with your class to scaffold the activity as necessary. For example:
  - Provide photocopies of weather symbols or ask students to draw their own.
  - Provide students with weather symbols or weather words already included on the internal pages of their book and ask them to complete the other columns.

  - Provide stem statements for students to describe their weather pictures (written on the board for them to copy from or photocopied on strips of paper to be pasted on), for example, 'When it is raining, I wear…', 'When it is hot, I can…'.

- *Optional:* Students could create books using computer applications.

Lesson steps

1 Review the class science journal, the word wall and the 'Weather watch' class table.

2 Review students' weather observations by asking questions such as:

- What things about weather have we investigated?
- How did we investigate the weather?

Optional: You might wish to refer to factual texts (see the Primary**Connections** website for suggestions) to assist students to summarise and describe what they know. Factual texts can also be used in this phase to support students to deepen their understanding of the concepts.

3 Question students to help them to summarise and clarify their ideas, for example:

- What have you learned about the weather?
- What have you noticed about the weather over one day?
- What have you noticed about the weather over one week?
- What have you noticed about the weather over one year?

Record students' responses in the class science journal on the 'What we have learned about weather' page.

4 Prompt students to clarify their observations by asking questions, such as:

- How do you know that?
- Is that always what happens?
- Can you think of a time when that didn't happen?

5 Explain that students are going to make their own books to show what they know about the weather and the seasons. Explain how you will organise this activity with your class (see example suggestions in 'Preparation').

6 Introduce an enlarged copy of 'Weather and me' (Resource sheet 6) or similar, and explain that students will need to include a weather symbol, matching weather word/s and drawings or pictures of what they can wear or do for each type of weather or season.

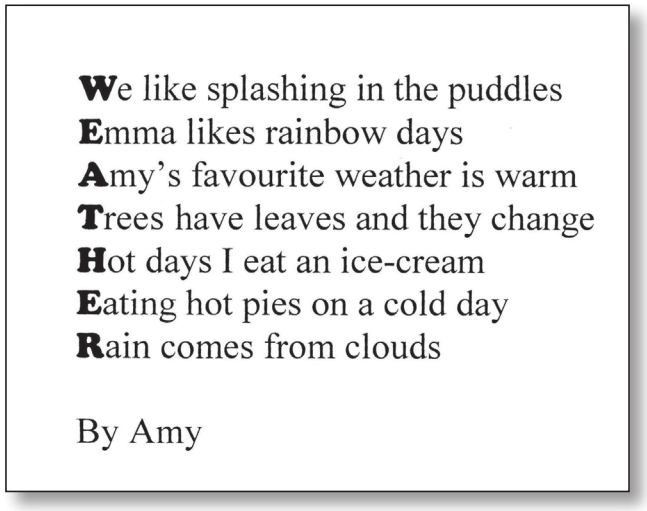
7 After students have completed their weather books, organise them to share their books with a partner. You might like to include the books in your class library and share them as a whole class.

EXPLAIN

Curriculum links

English

- Create acrostic poems to represent students' ideas about the weather.



We like splashing in the puddles
Emma likes rainbow days
Amy's favourite weather is warm
Trees have leaves and they change
Hot days I eat an ice-cream
Eating hot pies on a cold day
Rain comes from clouds

By Amy

Work sample of acrostic poem about weather

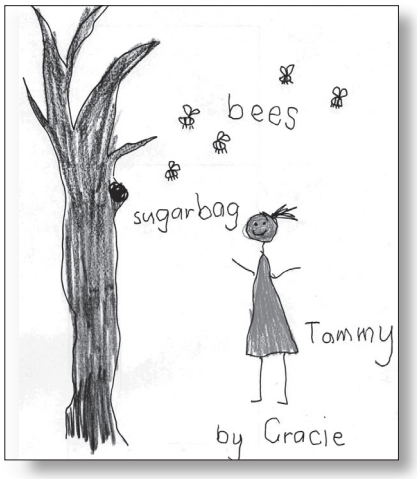
Mathematics

- Create a graph to summarise the number of sunny/rainy/cloudy days. Create a graph to represent students' favourite types of weather.

Indigenous perspectives

- Use Indigenous weather symbols in students' weather books and include observations about plants and animals in the environment.
- Read stories incorporating Indigenous ideas about the weather. Examples include:
  - *My home in Kakadu.*
    (Christophersen, J. (2005). *My home in Kakadu*. Broome: Magabala Books.)
  - *Ernie dances to the didgeridoo.*
    (Lester, A. (2000). *Ernie dances to the didgeridoo*. Sydney: Hodder Children's Books.)
  - *Walking with the seasons in Kakadu.*
    (Lucas, D. and Searle, K. (2003). *Walking with the seasons in Kakadu*. Sydney: Allen & Unwin.)
  - *Big Rain Coming.*
    (Germein, K. (1999). *Big Rain Coming.* New York: Clarion Books.)

- Create a class mural or annotated drawings about the stories.



Work sample of an annotated drawing

An Indigenous approach to weather includes environmental indicators, such as what animals are around and what plants are in flower or in fruit. Sometimes these indicators are shown on various seasonal calendars. See: www.abc.net.au/science/features/indigenous

- Invite local Indigenous community members to share their knowledge about environmental indicators in the local area. Create annotated drawings to illustrate the environmental indicators.
- Indigenous people might have their own way of understanding the world around them (see page 6). Contact local Indigenous community members and/or Indigenous Education Officers to access relevant, local Indigenous knowledge. Protocols are available on the website (www.primaryconnections.org.au).

Weather and me

Weather symbols	Weather words	What I wear or do

Lesson 6 Investigating the wind

PrimaryConnection Linking science with litera

AT A GLANCE

To support students to plan and conduct an investigation of wind strength.

Session 1 Moving materials

Students:

- discuss ideas and experiences of wind
- investigate moving different materials with wind.

Session 2 Using wind meters

Students:

- use a selection of materials to investigate wind around the school.

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 3).

Key lesson outcomes

Science

Students will be able to:

- identify wind strength as an important characteristic of weather
- observe the effect of wind on different materials
- use a wind meter to observe the strength of the wind.

Literacy

Students will be able to:

- record and report on an investigation of the wind
- use language to make distinctions, speculate and question
- follow directions to complete a simple investigation about the effect of wind on different materials.

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

Teacher background information

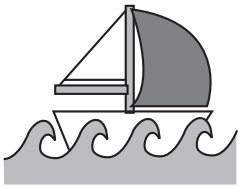
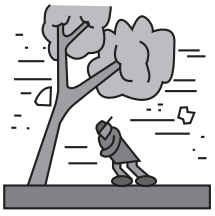
Wind is the movement of air over the surface of the Earth. Winds are driven by the heat from the Sun, which warms the air and causes it to rise. Where warm air rises, cool air flows in to take its place. This motion is felt on the Earth's surface as wind. Wind is described in terms of its strength or speed and the compass direction from which it is blowing. Wind speed can be expressed in kilometres per hour, metres per second, knots, or as a force on the Beaufort Scale.

The Beaufort Scale was developed by Sir Francis Beaufort, a British naval officer. Beaufort was born in Ireland in 1774 and began his nautical career at 13 as a cabin boy in the Royal Navy. He realised that it was important to be aware of weather conditions, so he started to keep a meteorological journal. Beaufort invented the Beaufort Scale in 1806 and the Royal Navy adopted his method in 1838.

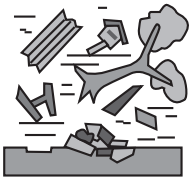
The Beaufort Scale classifies the wind into categories on the basis of its strength, from calm (no wind) to cyclone (wind speed over 118 kilometres per hour). Wind speed always increases with height above the ground, so wind speeds in the Beaufort Scale are measured at a height of 10 metres above open, flat ground.

When weather forecasters describe the wind they usually include information about both its strength and direction. For example, a fresh south-westerly wind is a wind blowing from the south-west at an average speed of 30–39 kilometres per hour (the speed of 'fresh breeze' on the Beaufort Scale). The term 'gusty' is often used in weather reports to describe winds that have sudden increases above the average speed for short periods of time.

Knowledge of wind strength is useful for recreational activities like sailing, the safety of people working in high places or at sea and for forecasting the movement of pollution and smoke from bushfires to populated areas.

Category	Description	Wind speed
0: calm	 Smoke rises vertically.	< 1 km/h, < 1 knot
1: light air	Wind directions shown by smoke-drift, but not by wind vanes.	1–5 km/h, 1–3 knots
2: light breeze	 Wind felt on face; leaves rustle; ordinary vanes moved by wind.	6–11 km/h, 4–6 knots
3: gentle breeze	Leaves, twigs in constant motion; wind extends light flag.	12–19 km/h, 11–16 knots
4: moderate breeze	 Raises dust and loose paper; small branches are moved.	20–28 km/h, 11–16 knots
5: fresh breeze	 Small trees in leaf begin to sway; crested wavelets form on inland waters.	29–38 km/h, 17–21 knots
6: strong breeze	Large branches in motion; whistling heard in telephone wires; umbrellas hard to use.	39–49 km/h, 22–27 knots
7: near gale	 Whole trees in motion; inconvenience felt when walking against the wind.	50–61 km/h, 28–33 knots
8: gale	Breaks twigs off trees; generally impedes progress.	62–74 km/h, 34–40 knots

ELABORATE

Category	Description	Wind speed
9: strong gale	 Slight structural damage occurs (chimney pots and roof tiles removed).	75–88 km/h, 41–47 knots
10: storm	 Seldom experienced inland; trees uprooted; considerable structural damage occurs.	89–102 km/h, 48–55 knots
11: violent storm	Very rarely experienced on land; accompanied by widespread damage.	103–117 km/h, 56–63 knots
12: cyclone/ hurricane		118+ km/h, 64+ knots

Beaufort Wind Scale

Images courtesy of Australian Government Bureau of Meteorology **www.bom.gov.au/lam/glossary/beaufort.shtml**

ELABORATE

Session 1 Moving materials

Equipment

FOR THE CLASS

- class science journal
- word wall
- team roles chart
- team skills chart
- 'Weather watch' class table
- range of differently weighted materials (eg, lightweight materials that do not tear easily (thin card, calico, plastic from plastic bags) and heavyweight (heavy card, balsa wood, linoleum) cut to the same size, eg, 8 cm x 15 cm)

FOR EACH TEAM

- each team member's science journal
- role wristbands or badges for Manager and Speaker
- hand-held fan (eg, made from thin pleated cardboard)
- 1 copy of 'Moving materials' (Resource sheet 7)

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 for Managers and Speakers, and the equipment table.
- Prepare a page in the class science journal with a title, for example, 'Investigating the wind'.
- Prepare hand fans or organise students to make these at an earlier time.
- *Optional:* Arrange for this lesson to be supported by an older 'buddy' class or adult helpers.

Lesson steps

1 Review the class's ongoing weather watch recording activity and discuss what the class has observed and recorded about the weather.

2 Recall the language about wind that students have used in previous discussions about the weather and when observing and recording for the weather watchers activity, for example:

- 'Do you remember when Yumi said it was windy yesterday morning?'

3 Invite students to wave their hands in front of their faces and to spin in a circle with their arms out to feel the movement of air around them. Ask 'What can you feel?' and elicit the idea that they feel moving air. Discuss that when students experience moving air outside it is part of the weather called wind.

4 Lead a discussion about students' experiences with wind. Discuss the types of activities that work well when there is wind, for example, flying kites.

5 Discuss with students how they can tell if there is a wind. Possible answers or observations might include that they can hear it and they see things, such as tree branches, flags and washing on a clothes line moving.

6 Discuss students' experience of wind around the school and pose the question: 'Is the wind different in different places around the school? Why do you think that?'. Record students' ideas in the class science journal.

7 Ask students to suggest how they could investigate the question and record ideas in the class science journal. Lead a discussion about the idea that students could make a wind meter to investigate the wind in different places around the school.

8 Select an example of a lightweight piece of material and discuss the wind strength that might move it, for example, a 'little' wind, a 'gentle' wind. Model using a hand-held fan to test. Repeat with a heavy weighted piece of material that needs a 'strong' wind to move.

9 Explain that students are going to investigate the wind strengths needed to move different materials. Explain that they will be working with a partner, as a collaborative learning team.

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

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

12 Introduce the selection of materials that teams can test. Write material names in the class science journal or add to the word wall for students to refer to.

13 Explain that teams will use a hand-held fan to test a number, for example, five or six of materials and their goal is to select two materials to use for their wind meter: one that moves with a light wind and one that needs a strong wind to move.

Introduce an enlarged copy of 'Moving materials' (Resource sheet 7) and explain how teams will record their findings in the table. For example, students might record by writing or drawing, or by pasting in a small sample of material. Review the purpose and features of a table (see Lesson 2).

14 Pair students and allocate Manager and Speaker roles. Ask Managers to collect equipment for their team from the equipment table.

15 After the investigation, discuss what teams found out about the wind strength needed to move different materials. Create a class record in the class science journal.

16 Explain that in the next session teams will use their information about materials to make a wind meter to use in different places around the school to investigate: 'Is the wind different in different places around the school?'

Moving materials

Manager's name: _____ **Date:** _____

Speaker's name: _____

Light wind	Strong wind

 ISBN 978 0 85847 307 2

Session 2 Using wind meters

Equipment

FOR THE CLASS

- class science journal
- word wall
- team roles chart
- team skills chart
- range of differently weighted materials that do not tear easily (eg, light weight (thin card, calico, plastic from plastic bag) and heavy weight (heavy card, balsa wood, vinyl floor tiles) cut to the same size, eg, 8 cm x 15 cm)
- *optional:* digital camera to record wind meters at different locations

FOR EACH TEAM

- each team member's science journal
- role wristbands or badges for Manager and Speaker
- completed table 'Moving materials' (Resource sheet 7) from Session 1
- coat-hanger or length of bamboo
- tape

Preparation

- Draw an investigation planner in the class science journal, for example:

Investigation planner

Question: Is the wind different in different places around the school?		
We will **change**		
We will **observe**		
We will keep the **same**		

- *Optional:* Arrange for this lesson to be supported by an older 'buddy' class or adult helpers.

Lesson steps

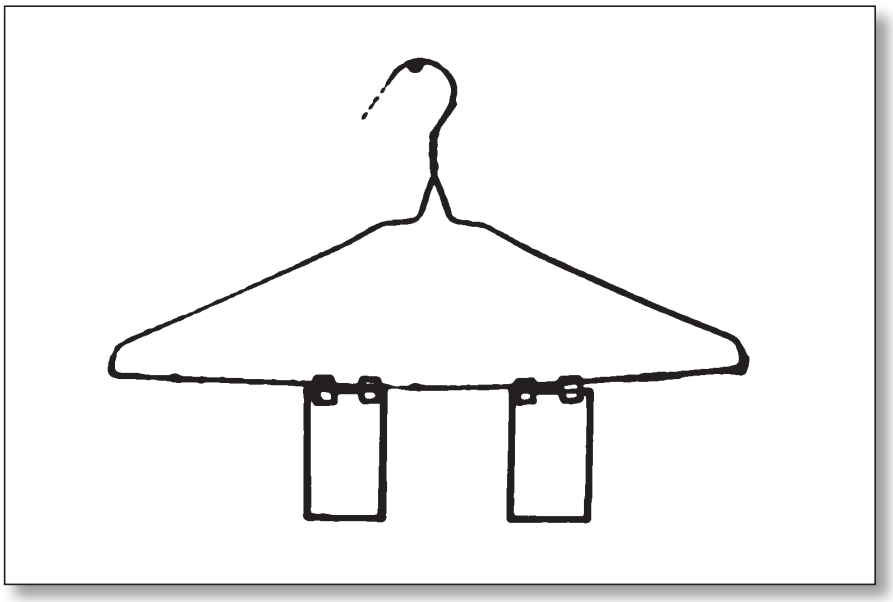
1 Review the previous session and teams' findings (completed Resource sheet 7). Review the question for investigation: 'Is the wind different in different places around the school?' and students' ideas recorded in the class science journal.

ELABORATE

2 Discuss how students could use materials to investigate wind strength in different places in the school, for example, by attaching the materials to a coat-hanger or length of bamboo and taking the wind meter to the different places.

3 Explain that teams will select one material that moved in a 'light' wind and one that moved in a 'strong' wind to use for their wind meters.

4 Model how to attach materials to the coat-hanger or bamboo.



Example of wind meter

5 Form teams and allocate roles. It is suggested that you keep the same teams as Session 1. After teams have constructed their wind meter, lead a discussion about how they will be able to tell how strong the wind is in different places using questions, such as:

- Using your wind meter, how will you know the wind is blowing?
- What will happen if there is no wind?
- What will happen if there is a strong wind?

6 Discuss what teams will:

- **change:** where the wind is tested
- **observe:** how much the materials move
- keep the **same:** the actual wind meter and the materials, the size of the materials, the way the materials are attached to the coat-hanger or bamboo, the height at which the wind meter is held.

For Foundation Year learners the teacher provides the information for the 'We will observe' section as this is usually the hardest part of the planner to decide.

Record ideas on the investigation planner in the class science journal.

Discuss why it is important to change only one thing at a time to keep the investigation fair. Read 'How to conduct a fair test' (Appendix 4).

7 Brainstorm places around the school where teams could test the wind. Discuss that teams will be able to find out if there is no wind, a light wind or a strong wind using their wind meters.

ELABORATE

8 Record their predictions about wind strength in different areas in the class science journal.

9 Move outside so teams can use their wind meters to observe the strength of the wind in three different places.

10 After returning to the classroom, ask students to record their findings. For example, students might:

- draw a picture of the wind meter at each place, showing how much the materials moved
- write the names of the places and the wind strength observed in each place.

Optional: annotate copies of photographs taken in the different locations.

11 Update the word wall.

12 Lead a discussion about teams' investigation findings. Discuss why it can be important to know about the wind (see 'Teacher background information') and how the wind affects students' lives.

13 Discuss what students learned about working in a team.

14 Share a text about wind, for example, *The wind blew* by Pat Hutchins.

Weather watchers (an ongoing experience)

From this point, when observing and recording daily weather for the 'Weather watch' class table, highlight details about wind, recalling ideas investigated in this lesson.

Remember to discuss clothing and activities that might be suited to the particular type of weather conditions.

Optional: Use the wind meter to investigate the wind on several different occasions.

ELABORATE

Curriculum links

English

- Use digital images to create a picture recount of the investigation.

Indigenous perspectives

The wind is important to some Indigenous people who hunt for food. The direction and strength of the wind can affect the use of hunting implements, for example, spears.

- Use confetti to demonstrate how releasing it shows the direction and strength of the wind. Provide natural materials, such as sand, grass, leaves and stones, for students to investigate which types of materials are most effective for determining wind direction and strength.
- Indigenous people might have their own way of understanding the world around them (see page 6). Contact local Indigenous community members and/or Indigenous Education Officers to access relevant, local Indigenous knowledge. Protocols are available on the website (www.primaryconnections.org.au).

Lesson 7 Weather reporters

AT A GLANCE

To provide opportunities for students to represent what they know about how daily and seasonal changes in our environment, including the weather, affect daily life, and to reflect on their learning during the unit.

Students:

- review the unit by using the science journal, word wall, 'Weather watch' class table and other resources developed during the unit
- plan and present a weather report
- reflect on their learning during the 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:

- daily and seasonal changes in our environment, including the weather, affect daily life.

Key lesson outcomes

Science

Students will be able to:

- describe characteristics of weather, such as cloud cover, temperature, wind and rain
- identify that weather changes
- identify clothes and activities that suit various weather conditions.

Literacy

Students will be able to:

- use language to clarify their understanding and reflect on their experience of weather
- with support, plan and present a weather report.

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
- 'Weather watch' class table
- 1 enlarged copy of 'Weather report planner' (Resource sheet 8)
- *optional:* digital and/or video camera to record weather reports

FOR EACH STUDENT

- 1 copy of 'Weather report planner' (Resource sheet 8) or similar
- *optional:* copies of weather symbols

Preparation

- Consider how you will organise this activity with your class, for example, roster three or four students daily to plan and present their weather reports.
- *Optional:* Students work in pairs to prepare and present their weather reports.
- *Optional:* Invite a weather reporter, for example, from television, newspaper or radio to talk with the class about their role as a weather reporter.

Lesson steps

1. Review the class science journal, the word wall and the 'Weather watch' class table. Review students' questions and the 'What we have learned about weather' page from the *Explain* phase and add any new information.
2. Explain that students are going to become weather reporters and they will plan and present their own weather report. Lead a discussion about the information that might be useful to include in the report, asking questions, such as:

- What have we investigated about weather, for example, clouds, wind, temperature?
- What type of information could you include in your weather report?

3 Introduce an enlarged copy of 'Weather report planner' (Resource sheet 8) and review the information it contains. Explain that students will complete a planner before they present their report to the class.

Completion of the planner and the discussion are opportunities for summative assessment as these activities will show what students know about identifying characteristics of weather, the seasons, and clothes and activities suited to particular conditions.

Optional: Discuss the props students might like to use, for example, temperature tool, wind meter or make, for example, a painting of a map or weather scene. You might like to use a large box for students to sit inside and present their weather report, similar to a television set.

4 Students (or students in collaborative learning teams) complete a copy of 'Weather report planner' (Resource sheet 8).

5 Arrange for the students to present their weather reports.

6 Review the *Weather in my world* unit with the class, asking questions, such as:

- Which activity helped you to learn something new?
- Which activity did you enjoy? Why?
- What did you learn about working with a partner?

Record students' responses in the class science journal.

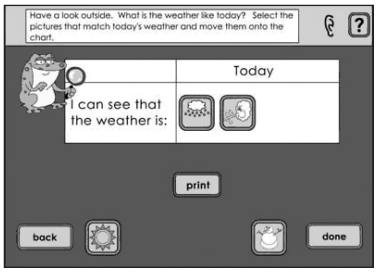
Curriculum links

The Arts

- Create props to use when presenting weather reports.

Information and Communication Technology (ICT)

- Arrange for students to complete the Science Education Assessment Resources (SEAR) task *Daily weather* (Task code 1EB067). This summative assessment task requires students to find or draw four pictures showing different weather conditions. Students describe the properties of the weather and choose an activity suited to those weather conditions.
- Use a digital camera to record the weather report presentation. Use the images to make a PowerPoint presentation, prepare word processing documents or make a movie.



Explore the weather (includes spoken instructions), L9 (www.scootle.edu.au)

Explore the weather (no spoken instructions), L193 (www.scootle.edu.au)

Students help Frog explore elements related to particular types of weather.

Experience the weather (includes spoken instructions), L10 (www.scootle.edu.au)

Experience the weather (no spoken instructions), L194 (www.scootle.edu.au)

Students explore the links between the climates of four locations: Antarctica, the Sahara desert, the New Zealand mountains, and the Amazon rainforest. Using a palette of choices, students select weather conditions typical of each location.

Weather wear (includes spoken instructions), L11 (www.scootle.edu.au)

Weather wear (no spoken instructions), L195 (www.scootle.edu.au)

Set on a sailing boat, students hear and/or read weather forecasts. They then prepare Gecko and the boat for the weather ahead. Students can also determine the weather conditions and explore the results.

EVALUATE

Weather report planner

Name: _____ **Date:** _____

cloud cover	**temperature**	**rain**	**wind**
What I can wear for this weather			
What I can do in this weather			

 ISBN 978 0 85847 307 2

Appendix 1
How to organise collaborative learning teams (F–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.

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.
- If you cannot divide the students in your class into teams of three, form two teams of two students rather than one team of four. It is difficult for students to work together effectively in larger groups.
- 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.

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

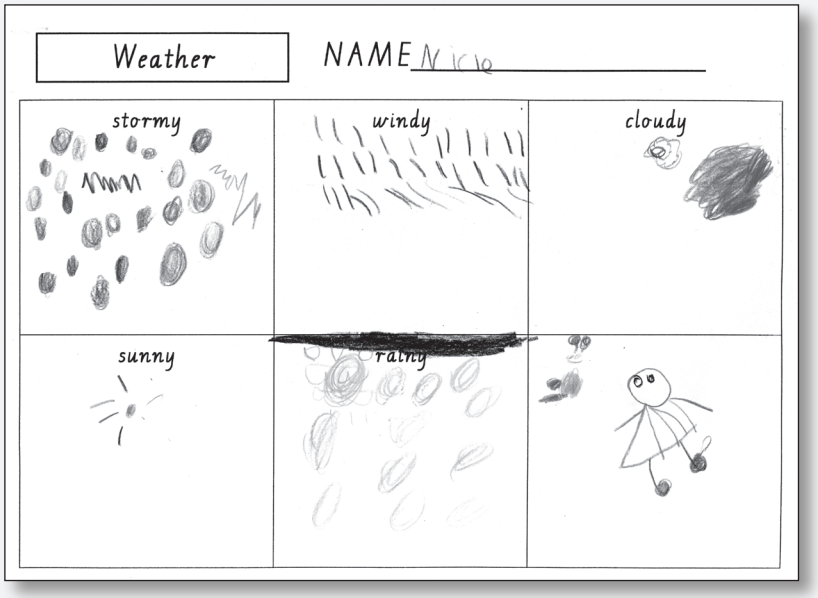
revise this material during the unit. Explore the vocabulary, visual texts and ideas that have developed from the science unit, and encourage students to use them in their science journals.

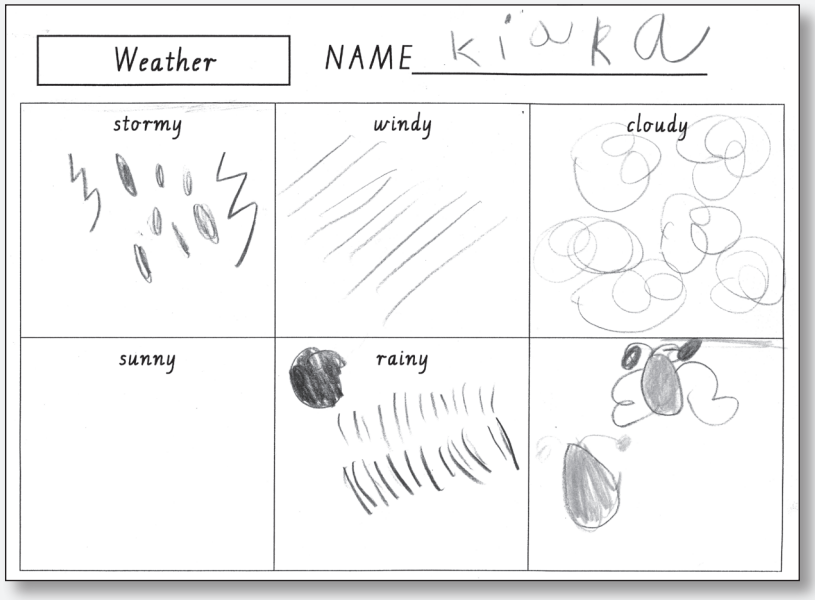
7 Combine the use of resource sheets with journal entries. After students have pasted their completed resource sheets in their journal, they might like to add their own drawings and reflections.

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.

Weather in my world **science journal**





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.

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.

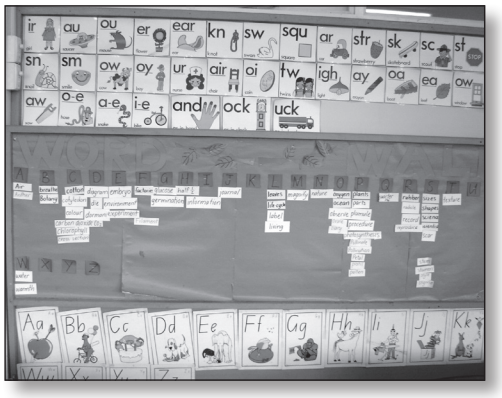
Choose robust material for the word cards. Write or type words on cardboard and perhaps laminate them. Consider covering the wall with felt-type material and backing each word card with a self-adhesive dot to make it easy for students to remove and replace word cards.

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 apple for a needs unit.

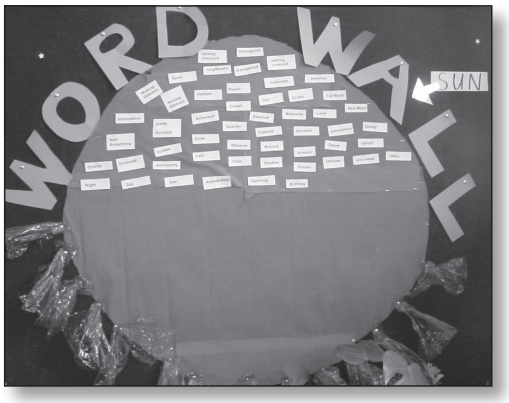
The purpose is for students to be exposed to a print-rich environment that supports their science and literacy experiences.

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 weather unit might be organised under headings, such as ‘Clouds’ and ‘Weather symbols’.

Invite students to contribute words from different languages to the word wall. Group words about the same thing, for example, different names for the same weather type, 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.



***Plants in action* word wall**



***Spinning in space* word wall**

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 individual students during literacy experiences. Organise multi-level activities to cater for the individual needs of students.

***Weather in my world* word wall**

Appendix 4
How to conduct a fair test

Introduction

Scientific investigations involve posing questions, testing predictions, planning and conducting tests, interpreting and representing evidence, drawing conclusions and communicating findings.

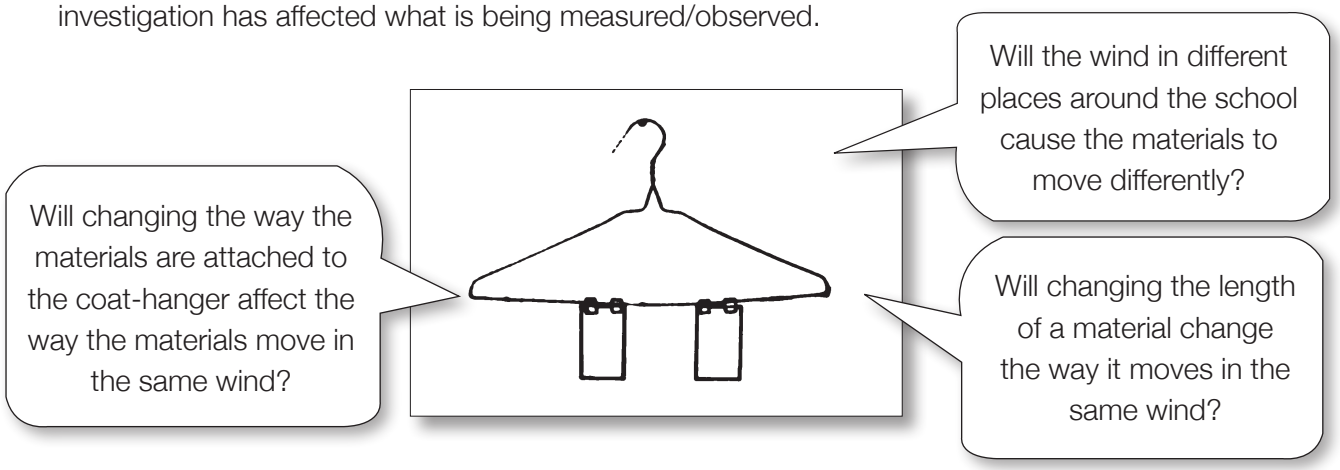
Planning a fair test

In *Weather in my world*, students investigate things that affect the movement of materials hanging on a wind meter.

All scientific investigations involve variables. Variables are things that can be changed (independent), measured/observed (dependent) or kept the same (controlled) in an investigation. When planning an investigation, to make it a fair test, we need to identify the variables.

Note: It is not intended that Foundation Year students be introduced to the word 'variable'.

It is only by conducting a fair test that students can be sure that what they have changed in their investigation has affected what is being measured/observed.



'**C**ows **M**oo **S**oftly' is a useful scaffold to remind students how to plan a fair test:

Cows: **Change** one thing (independent variable)
Moo: **Measure/Observe** another thing (dependent variable) and
Softly: keep the other things (controlled variables) the **Same**.

To investigate wind strength in different places in the school, students could:

CHANGE	where the wind is tested	Independent variable
MEASURE/OBSERVE	how much the materials move	Dependent variable
KEEP THE **SAME**	The actual wind meter and the materials, the size of the materials, the way the materials are attached to the coat-hanger or bamboo, the height at which the wind-meter is held.	Controlled variable

Appendix 5
Weather in my world equipment list

EQUIPMENT ITEM	QUANTITIES	LESSON	1	2	2	2	3	4	4	5	6	6	7
		SESSION		1	2	3		1	2		1	2	
Equipment and materials													
A3 paper	4 sheets per class							●					
A4 card	4 sheets per class								●				
booklet, 'Weather and me'	1 per student									●			
bucket of ice cubes *optional*	1 per class							●					
coat hanger or length of bamboo	1 per team											●	
coloured pencils, including red and blue	1 set per student								●				
factual texts about the weather	1 per class						●			●			
fan (made from paper or card) or piece of paper	1 per student							●					
fan, hand-held (made from thin pleated cardboard)	1 per team										●		
frame (eg, cut from ice-cream container lid, cardboard)	1 per student		●				●						
glue	1 per student				●								
newspaper	1 per class				●								
scissors	1 per student				●				●				
self-adhesive notes or strips of paper	sufficient quantity per class							●					
small pieces of paper (approx. 8 cm x 8 cm)	4 per student			●									
peg or large paper clip	1 per student								●				
photographs of symbols used in everyday life *optional*				●									
photographs of the sky *optional*							●						
range of differently weighted materials	sufficient quantity per class										●	●	
source of cold air (eg, a freezer, a refrigerator, an air conditioner, a fan)	1 per class							●					
source of warm or hot air (eg, a hair dryer, a blow heater)	1 per class							●					
string or chalk to mark physical temperature scale	1 per class								●				
tape	1 per team											●	
thermometers (different types including colour band, alcohol and digital thermometers)	1 set per class								●				
weather symbols *optional*	1 set per class					●							

EQUIPMENT ITEM	QUANTITIES	LESSON	1	2	2	2	3	4	4	5	6	6	7
		SESSION		1	2	3		1	2		1	2	
Resource sheets													
– 'Symbols in my world' (RS1)	1 per class			●									
– 'Weather symbols used by the Bureau of Meteorology' (RS2)	1 per class					●							
– 'Weather watch' (RS3), enlarged	1 per class					●							
– 'Eye to the sky' (RS4)	1 per class						●						
– 'Our temperature tool' (RS5), on A4 thin card	1 per student								●				
– 'Our temperature tool' (RS5), enlarged	1 per class								●				
– 'Weather and me' (RS6)	1 per student									●			
– 'Moving materials' (RS7)	1 per team										●	●	
– 'Weather report planner' (RS8)	1 per student												●
– 'Weather report planner' (RS8), enlarged	1 per class												●
Teaching tools													
class science journal	1 per class		●	●	●	●	●	●	●	●	●	●	●
role wristbands or badges for Manager and Speaker	1 set per team										●	●	
student science journal	1 per student		●	●	●		●				●	●	
team roles chart	1 per class										●	●	
team skills chart	1 per class										●	●	
'Weather watch' class table	1 per class						●	●	●	●	●		●
word wall	1 per class		●	●	●	●	●	●	●	●	●	●	●
Multimedia													
audiovisual equipment (eg, television, DVD player)	1 set per class				●								
computer and appropriate software *optional*				●									
computer/s with internet access *optional*					●								
copies of weather symbols *optional*										●			●
digital camera and/or video camera *optional*												●	●
newspaper weather report	1 per student				●								
recording of a television weather report	1 per class				●								
set of newspaper weather map symbols	1 per class				●								
weather sound clips (see the Primary**Connections** website) *optional*				●									

Appendix 6
Weather in my world unit overview

		SCIENCE OUTCOMES*	LITERACY OUTCOMES*	LESSON SUMMARY	ASSESSMENT OPPORTUNITIES
		Students will be able to represent their current understanding as they:	Students will be able to:	Students:	
ENGAGE	**Lesson 1** Wondering about the weather	• observe characteristics of weather • identify some characteristics of weather • recall characteristics of weather and record them as drawings.	• contribute to discussions about weather • recount their personal experiences of weather • record ideas in a science journal.	• experience the weather outside the classroom • represent their ideas about weather through drawing • share ideas and questions about weather.	**Diagnostic assessment** • Represent ideas about weather through drawing and writing • Through discussion, share ideas and questions about weather

* 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
		Students will be able to:	Students will be able to:	Students:	
EXPLORE	**Lesson 2** Watching the weather ***Session 1*** Drawing weather symbols ***Session 2*** Weather symbol detectives ***Session 3*** Weather watchers (an ongoing experience)	• identify some characteristics of weather • identify symbols used to represent characteristics of weather • observe and record characteristics of weather.	• recognise symbols and words used to describe weather • view newspaper and television weather reports and make links with their personal experience • recount their personal experience of weather • identify the broad purposes and features of a table • retrieve information from a weather recording table created as a class • share in writing a summary of the day's weather.	***Session 1*** Drawing weather symbols • discuss how symbols are used to communicate information • create symbols that represent characteristics of weather. ***Session 2*** Weather symbol detectives • explore symbols used in newspaper and television weather information reports • discuss why people want to know about the weather. ***Session 3*** Weather watchers (an ongoing experience) • participate in ongoing observation, recording and discussion of daily weather conditions.	**Formative assessment** • Science journal entries • Weather watch recording table' (Resource sheet 3)

* 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
		Students will be able to:	Students will be able to:	Students:	
EXPLORE	**Lesson 3** Eye to the sky	• use a frame to observe the sky • identify clouds as a feature of the sky • describe how much of the sky is covered by cloud.	• use appropriate language to describe the amount of cloud cover • participate in a discussion to recount observations and experience relating to cloud cover and weather characteristics • retrieve information from a table.	• discuss their experiences of observing and recording the weather • make observations of the sky • discuss language used to describe the amount of cloud cover • represent observations of cloud cover and label appropriately.	**Formative assessment** • Science journal entries

* 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
		Students will be able to:	Students will be able to:	Students:	
EXPLORE	**Lesson 4** What's the weather like today? ***Session 1*** How does it feel? ***Session 2*** A temperature tool	• identify that temperature is a distinctive characteristic of the weather • use a scale to describe temperature conditions • identify that thermometers can be used to measure temperature.	• use talk to report on observations and reflect on their experience of temperature • physically represent their understanding on a simple temperature scale • follow instructions to make a temperature tool • use a simple temperature scale to describe temperature.	***Session 1*** How does it feel? • discuss their experiences of observing and recording the weather • recall language about temperature • describe how the air feels • investigate temperature. ***Session 2*** A temperature tool • observe and experience the weather while outside • explore the term 'temperature' • make a descriptive temperature scale that uses words and colours.	**Formative assessment** • 'Our temperature tool' (Resource sheet 5)

* 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
		Students will be able to:	Students will be able to:	Students:	
EXPLAIN	**Lesson 5** My weather book	• identify that weather has distinctive characteristics (cloud cover, temperature, wind and rain) • identify that weather changes over time • review and summarise records of weather observations.	• clarify their understanding and reflect on their experience of observing and recording the weather • construct and retell meanings from a weather recording table • write and illustrate simple descriptions of weather characteristics.	• review the 'Weather watch' class table, word wall and class science journal • discuss observations of weather • represent observations of weather and identify clothes and activities suitable for various weather conditions.	**Formative assessment** • Represent weather symbols, words, clothing and activities • 'Weather and me' (Resource sheet 6)
ELABORATE	**Lesson 6** Investigating the wind ***Session 1*** Moving materials ***Session 2*** Using wind meters	• identify wind strength as an important characteristic of weather • observe the effect of wind on different materials • use a wind meter to observe the strength of the wind.	• record and report on an investigation of the wind • use language to make distinctions, speculate and question • follow directions to complete a simple investigation about the effect of wind on different materials.	***Session 1*** Moving materials • discuss ideas and experiences of wind • investigate moving different materials with wind. ***Session 2*** Using wind meters • use a selection of materials to investigate wind around the school.	**Summative assessment** of Science Inquiry Skills • 'Moving materials' (Resource sheet 7) • Investigation record

* 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
		Students will be able to:	Students will be able to:	Students:	
EVALUATE	**Lesson 7** Weather reporters	• describe characteristics of weather, such as cloud cover, temperature, wind and rain • identify that weather changes • identify clothes and activities that suit various weather conditions.	• use language to clarify their understanding and reflect on their experience of weather • with support, plan and present a weather report.	• review the unit by using the science journal, word wall, 'Weather watch' class table and other resources developed during the unit • plan and present a weather report • reflect on their learning during this unit.	**Summative assessment** of Science Understanding • Plan and present a weather report • 'Weather report planner' (Resource sheet 8)

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

PrimaryConnections®
Linking science with literacy

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

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

PrimaryConnections®
Linking science with literacy

*Primary**Connections**: 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 sophisticated professional learning component and exemplary curriculum resources.

Primary**Connections** features an inquiry-based approach, embedded assessment and incorporates Indigenous perspectives.

The Primary**Connections** curriculum resources span Years F–6 of primary school.

www.primaryconnections.org.au

Australian Academy of Science

ISBN 978-0-85847-307-2

PC:F:E1