How do living things respond to the effects of changing seasons and resources?

Science – Earth and space sciences, Foundation to Level 2

Exploring socio-scientific   
issues using scientific thinking

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Introduction

Aboriginal and Torres Strait Islander cultures are the oldest continuous cultures in the world, having existed in Australia for at least 50,000 years. Part of the knowledge in these cultures has been drawn from an understanding of the observable changes across seasons and the availability of Earth’s resources in different seasons. As our climate changes there is a real possibility that seasons will become unpredictable and normal seasonal indicators will no longer be seen. This will have an impact on how humans and other animals use and value Earth’s resources.

The socio-scientific issue of how humans respond to changing seasons is complex, because it involves not only scientific and technological understanding and expertise but also the building of an understanding of relevant social, political, economic, health and safety, geological and environmental factors and how these interrelate.

This resource contains three learning activities, each of which includes up to four tasks. Teachers may choose to undertake the tasks and/or activities in any order they choose but should note that undertaking a single task within an activity may not enable full coverage of the mapped content descriptions and achievement standard extracts.

This resource provides students with opportunities to:

* explore their own and others’ ideas about Earth’s resources (Learning activity 1)
* consider how seasons affect the availability of Earth’s resources (Learning activities 1, 2 and 3)
* use scientific knowledge and skills to explore how and why Earth’s resources change over time (Learning activities 1 and 3)
* use critical and creative thinking capabilities to consider what would happen to the availability of Earth’s resources if seasons became unpredictable (Learning activities 1 and 3).

Teacher note: Collecting and using materials from the environment

Some activities require the use of natural materials that need to be collected from the environment. It is important to protect habitats. Leaf litter such as leaves, twigs and bark make up an important part of healthy soil; where possible take only the bare minimum and return unused materials once the activity is completed. Advise students not to disturb living things – for example, they should not break off parts of living plants but rather use what has fallen on the ground. When exploring national parks, remember it is illegal to remove any material. It is always better to check with the land manager before collecting specimens from public land.

Sample key science concepts

* Earth’s resources have been used for a long time and continue to be used in Aboriginal and Torres Strait Islander cultures.
* Both Western seasons and Koorie seasons have seasonal indicators, such as hot and cold weather.
* The availability of Earth’s resources changes depending on the season.
* Seasonal variation (differences between the seasons) can be recognised by changes in the landscape.
* Humans and animals respond to a change in the availability of Earth’s resources*.*
* Humans can predict the availability of Earth’s resources because of the predictability of the changing seasons*.*
* If seasons become unpredictable humans and other animals will not be able to use Earth’s resources in the same ways*.*

Links to the Victorian Curriculum F–10

The Victorian Curriculum F–10 content descriptions and achievement standard extracts that are applicable to each of the three learning activities have been mapped in the tables below.

Science, Foundation to Level 2

| **Strand** | **Sub-strand** | **Content description** | **Relevant element of the achievement standard** | **Learning activity** | | |
| --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | **3** |
| Science Understanding | Earth and space sciences | Earth’s resources are used in a variety of ways [(VCSSU047)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSSU047) | … identify and describe the changes to objects, materials, resources, living things and things in their local environment | ✓ | ✓ | ✓ |
| Science Understanding | Earth and space sciences | Daily and seasonal changes affect everyday life [(VCSSU046)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSSU046) | … suggest how the environment affects them and other living things | ✓ | ✓ | ✓ |
| Science Understanding | Science as a human endeavour | People use science in their daily lives [(VCSSU041)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSSU041) | … describe examples of how people use science in their daily lives | ✓ | ✓ | ✓ |
| Science Understanding | Biological sciences | Living things have a variety of external features and live in different places where their basic needs, including food, water and shelter, are met [(VCSSU042)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSSU042) | … identify and describe examples of the external features and basic needs of living things.  … describe how different places meet the needs of living things |  | ✓ | ✓ |
| Science Understanding | Chemical sciences | Objects are made of materials that have observable properties [(VCSSU044)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSSU044) | … describe the properties, behaviour, uses and the effects of interacting with familiar materials and objects | ✓ |  | ✓ |
| Science Understanding | Chemical sciences | Everyday materials can be physically changed or combined with other materials in a variety of ways for particular purposes [(VCSSU045)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSSU045) | … identify and describe the changes to objects, materials, resources, living things and things in their local environment |  | ✓ | ✓ |
| Science Inquiry Skills | Questioning and predicting | Respond to and pose questions, and make predictions about familiar objects and events [(VCSIS050)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSIS050) | … pose and respond to questions about familiar objects and events and predict outcomes of investigations | ✓ | ✓ | ✓ |
| Science Inquiry Skills | Planning and conducting | Participate in guided investigations, including making observations using the senses, to explore and answer questions [(VCSIS051)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSIS051) | … use their senses to explore the world around them |  | ✓ | ✓ |
| Science Inquiry Skills | Analysing and evaluating | Compare observations and predictions with those of others [(VCSIS054)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSIS054) | … make and compare observations | ✓ |  | ✓ |
| Science Inquiry Skills | Recording and processing | Use a range of methods, including drawings and provided tables, to sort information [(VCSIS053)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCSIS053) | … record, sort and represent their observations and communicate their ideas to others | ✓ | ✓ | ✓ |

Other curriculum areas

Some links to other curriculum areas are detailed in the table below. Teachers may also be able to incorporate curriculum content from Design and Technologies and the Arts into the learning activities, as well as learning about the cross-curriculum priorities of Sustainability and Aboriginal and Torres Strait Islander Histories and Cultures.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Curriculum area and level(s)** | **Strand** | **Content description** | **Relevant element of the achievement standard** | **Learning activity** | | |
| **1** | **2** | **3** |
| Mathematics,  Level 2 | Measurement and Geometry | Name and order months and seasons [(VCMMG118)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMMG118) | … identify ... months included in seasons and other events |  | ✓ | ✓ |
| Intercultural Capability, Foundation to Level 2 | Cultural Practices | Identify what is familiar and what is different in the ways culturally diverse individuals and families live [(VCICCB001)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCICCB001) | … begin to distinguish what is familiar and different in the ways culturally diverse individuals and families live | ✓ |  | ✓ |
| Critical and Creative Thinking, Foundation to Level 2 | Questions and Possibilities | Consider personal reactions to situations or problems and how these reactions may influence thinking [(VCCCTQ002)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCCCTQ002) | … generate ideas that are new to them and make choices after considering personal preferences | ✓ |  | ✓ |
| Critical and Creative Thinking, Foundation to Level 2 | Questions and Possibilities | Make simple modifications to known ideas and routine solutions to generate some different ideas and possibilities [(VCCCTQ003)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCCCTQ003) | … generate ideas that are new to them and make choices after considering personal preferences | ✓ | ✓ | ✓ |
| Critical and Creative Thinking, Foundation to Level 2 | Reasoning | Compare and contrast information and ideas in own and others reasoning [(VCCCTR005)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCCCTR005) | … identify words that indicate components of a point of view | ✓ |  | ✓ |
| Critical and Creative Thinking, Foundation to Level 2 | Reasoning | Consider how reasons and examples are used to support a point of view and illustrate meaning [(VCCCTR006)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCCCTR006) | … use reasons and examples for different purposes | ✓ |  | ✓ |

Teacher background information

Australia is a large continent with varying climates and many Aboriginal and Torres Strait Islander language groups. Aboriginal cultural understanding of country and seasonal flora and fauna availability has come from the predictability of seasons and the effects of seasonal indicators on country, for example, wildflowers blooming and a river running high.

During the learning activities students are introduced to the idea of Western seasons and Koorie seasons and the simple seasonal indicators of hot and cold weather, and how these factors can affect how they dress themselves. The diversity of seasons throughout Australia is described in reference to different natural resources, before students attempt to make connections with what resources would be available in different seasons. Students will understand that seasonal variation can be recognised by changes in the landscape and that those changes are predictable. Students will also be able to determine how science uses the term ‘evidence’ and be able to describe evidence of seasons.

On completion of the activities, students will be able to make their own decisions as to what they think will happen to Earth’s resources as the seasons change and become less predictable.

Learning activities and resources

Learning activity 1: Changing days and seasons

Learning intentions

Students will be able to:

* consider how daily and seasonal changes affect everyday life, such as the way we dress
* describe how Earth’s resources are used in a variety of ways
* make predictions for the use of objects found in everyday life
* describe the general features of each season, including which months relate to each season
* make modifications to ideas through considering their own personal preferences towards seasons and clothing
* explore similarities and differences between Western and Koorie calendars used in Australia
* describe weather features from northern to southern Australia.

Learning ideas

Task A: Make clothing choices based on the seasons

* Ask students in pairs to describe their clothes: Are they wearing short sleeves or long sleeves? Short pants or long pants? Jumpers or T-shirts? What does the clothing feel like? Thin or thick? Fluffy or scratchy? What are some reasons we wear certain types of clothes (for example, culture, religion, school dress code)? Do most students wear short sleeves on a particular day?
* Ask students to justify why they have worn those clothing items in response to the weather outside.
* Discuss with students whether their clothes change over a day–night period. Explore reasons for changing clothes by asking ‘What if …’ questions – for example, ‘What if you wore your pyjamas to school?’ and ‘What if you wore your raincoat to bed?’ – and sort students’ answers into two categories: reasons that are weather-dependent and reasons that are not weather-dependent.
* Discuss with students whether their clothing choices stay the same throughout the year or change. Why would the types of clothing worn change throughout the year?
* Use a Western calendar to identify the four seasons (summer, autumn, winter, spring) and the months in those seasons. How different are the four seasons?
* Ask students to consider how a ‘summer’ wardrobe may look different from a ‘winter’ wardrobe.
* Can ‘summer’ and ‘winter’ clothes be mixed up to create ‘autumn’ and ‘spring’ clothes, or are different clothes needed for spring and autumn?
* What are the properties of the materials used for clothing in different seasons? What is used to make a dress compared to a jumper?
* Use a Koorie calendar applicable to your location to identify seasons (for example, see [Koorie Seasons and Astral Calendars, Victorian Aboriginal Education Association Inc.](http://www.vaeai.org.au/wp-content/uploads/delightful-downloads/2019/06/Koorie-Seasons-and-astral-calendars_final.pdf)).
* How many seasons are in your local Koorie calendar?
* Do different seasons require different clothes?
* Western calendars are based on fixed seasons at particular times of the year and are used in many countries around the world, whereas Koorie calendars take into account how Earth’s resources change over time and are based on observable local changes involving living and non-living things. Ask students whether they know someone who lives in another country or another state in Australia. Discuss why Koorie calendars are specific to a local area by identifying particular parts of a Koorie calendar for their own area that may not apply to an area in another Australian state or country.

**Extension:** Compare changes from day to day with changes over a season. Changes may include weather (for example, sunny, raining, windy, cloudy) and landscape changes (for example, plant growth, tidal patterns, river levels, wildlife numbers).

* Ask students to predict whether there would be more changes day to day or from season to season.
* Ask students prompt questions such as: How can daily changes be recorded? How can seasonal changes be recorded? Is it easier to predict day-to-day or seasonal changes?
* There is a saying: ‘Red sky at night, shepherd’s delight. Red sky in the morning, shepherd’s warning.’ Discuss what this means (that is, a red sky at night being a predictor of sunny weather the next day and a red sky in the morning being a predictor of rain). Explore ideas with students as to how this saying could be tested scientifically; follow up with students recording what the sky looks like in the morning and at night for a week, and seeing whether there are any emerging patterns.

Task B: Describe and compare different climates

* Read one of the following books about seasons in Australia:
* *Walking with the Seasons in Kakadu,* Diane Lucas and Ken Searle (Allen and Unwin Children, 2005)
* *My Home in Kakadu*, Jane Christophersen (Magabala Books, 2005; also available [read by Torres Strait Islander Mr Charles Jia](https://www.crackerjackeducation.com.au/resources/my-home-in-kakadu/)).
* After reading the text brainstorm the following questions with students in order to gather their prior knowledge of seasons and scientific evidence of seasons:
* What season is our environment in now?
* How do we know it is that season?
* An observation or information that we use to support our ideas, beliefs, opinions and arguments is what scientists call ‘evidence’. What evidence do we have of the season we are currently in? Use a circle divided into quarters and ask students to draw the features of each season. Make sure to include the months of the year.
* How do we know when the seasons have changed?
* Using a map of Australia, locate your school (as an example of a southern climate) and locate Kakadu (as an example of a northern climate). Point out that areas to the south of Australia are cold and have distinct seasons. Areas to the north are hot and have two seasons only: wet season and dry season.
* On the board make a list of words that can describe different climates. Students use a record sheet such as [Appendix 1: How is southern Australia different from northern Australia?](#App1) to compare southern and northern Australian climates.

Task C: Construct a nature table

For this task you will construct a nature table in the classroom to represent the current season and how objects found in that season could be used by humans.

**Teacher note:** Where specimen collection is inappropriate, nature tables may include photographs, drawings or models.

* Begin by taking students for a walk in the schoolyard or local area, drawing from the ideas of evidence of seasons (see Task B). Students may collect non-living specimens to help create the classroom nature table. Explain why it is important to leave living things in their environment.
* Students work in small groups to look at the similarities and differences between the specimens they have collected. Specimen groupings can be categorised by size, texture, colour, density or availability. Each group of students should explain how they grouped their specimens and why. List on the board examples of categories used. If you have time, have students come up with one or more alternative ways in which you could group these specimens.
* Discuss as a class how you could group the specimens for the whole-class nature table. Create it together and count how many different categories there are, as well as how many items there are in each category.
* Provide students with a table (see example in [Appendix 2: Nature table predictions](#App2)) to record predictions about how the objects on the nature table could be used by humans. For example, in spring you might find wattle seeds; these can be used as food to make a type of bread. You might find a branch that was blown from a tree in a winter storm; this could be used as part of a shelter. Compare and discuss students’ predictions. Consider the properties of each of the objects on the nature table that make them fit for each purpose.
* Have students make models or drawings as representations of other items from other seasons and construct a second nature table for the coming local season. When the season has turned, repeat the process of constructing a nature table and try to replace the models of predicted items with the actual items. Discuss with students how their predictions compared with what happened when the season changed and explore reasons for any differences. Consider the questions: What are the advantages and disadvantages of making predictions? How can predictions be tested?

Task D: Dress for the weather

Ask students to form pairs and trace each other’s body twice on a large piece of butcher’s paper. Alternatively, provide students with a small template (for example, see [Appendix 3: Dressing for the seasons](#App3)).

* Arrange students into teams of three or four and challenge them to draw clothes on their outlines that are appropriate for the season that you describe. For example, you might say ‘Team 1 can you please dress your person for a hot, wet spring day?’ and ‘Team 2 can you please dress your person for a cold, dry winter day?’.
* Explain to students about the possum skin cloak, which was used in all weather conditions by the Kulin peoples. These cloaks were designed to be used throughout the owner’s lifetime and often as a burial wrapping. Use information from the [‘Possum skin cloak’ webpage (Australian Institute of Aboriginal and Torres Strait Islander Studies)](https://aiatsis.gov.au/explore/possum-skin-cloak) to support the discussion.
* Brainstorm which other of Earth’s resources could be used as clothing.

**Teacher note:** Discuss the availability of resources in each season and what could happen if the seasons became less predictable and less materials to use were produced.

* Challenge each team to dress their other outline in clothes from things that can be found in the environment appropriate for the seasons that you described earlier.
* Each team presents their dressed body outline to the rest of the class. Team members take turns to describe one piece of clothing, what it was made from and why the material was chosen for the particular purpose, for example, explaining why tree leaves were chosen to make an umbrella.
* After each student presents their clothed outline to the class, other students provide further ideas. They could comment on the advantages and disadvantages of using materials for particular purposes; for example, the advantage of using tree leaves to make an umbrella is that tree leaves are waterproof but a disadvantage may be that it is difficult to get leaves from deciduous trees in winter when it rains or it is difficult to stick the leaves together to form an umbrella and it may leak unless very large leaves were used.

Learning activity 2: Earth’s resources

Learning intentions

Students will be able to:

* give examples of how daily and seasonal changes affect everyday life
* use a variety of methods to sort information
* identify what resources living things need
* consider personal reactions to changes in seasons and how they influence thinking
* predict changes to animal and human behaviour if Earth’s resource availability changes because seasons are no longer predictable.

Learning ideas

Task A: Imagine how Earth’s resources change with the seasons

* Listen to the creation story ‘Tiddalik the Frog’ on the [Bunjilaka Aboriginal Cultural Centre’s Creation Stories webpage (Museums Victoria)](https://museumsvictoria.com.au/bunjilaka/about-us/creation-stories/).
* After hearing the text, make a list of Earth’s resources. Discuss how Earth’s resources, like water, are connected to the needs of living things. For example, consider the other animals in the story.
* What would happen to the other animals if they couldn’t get Tiddalik to laugh?
* What would happen to Earth’s resources if there was no water?
* Building on students’ understanding of seasonal changes (from Learning activity 1) and their own observations and ideas about seasonal changes, discuss the following questions:
* What time of the year might this story take place? Name some of Earth’s resources that you have identified that could support your suggestion.
* Which of Earth’s resources change depending on the seasons? Which of Earth’s resources do not change with the seasons?
* How would you imagine this place might look in the wet season? In the dry season? Divide a piece of paper into two and sketch your ideas.
* Fill a small container with sand, add water and then leave it in the sun. Have students make predictions about what will happen to the sand and water. Students observe the water over two full school days and record the level of the water at regular intervals. Discuss the following questions:
* Was your prediction correct?
* How long did the sand take to dry out? Did it dry out quickly or slowly?
* Where did the water go?
* What might happen to a frog if it lived in a billabong that dries out over summer?

Task B: Take a sensory walk to identify Earth’s resources in the local landscape

* Take a walk around the school or local neighbourhood to identify environments and the resources that living things depend on to meet their basic needs. Stop in different locations and advise students to pay attention to four of their senses – sight, hearing, touch and smell – to investigate. Discuss with students why the sense of taste should not be used for this activity and why making observations using the other senses must be done with care.
* Record observations on the sensory walk. [Appendix 4: Sensing our place](#App4) targets student scientific observation skills by supporting students to describe the living things and the resources they depend on in the environment.
* As a class, collate student observations and ideas to make a list of the living things and which of Earth’s resources each living thing relies on. Students should be able to identify multiple examples for each. Class results may be recorded in a table such as the following.

| **Living thing** | **Needs of living things** | | |
| --- | --- | --- | --- |
| **Earth’s resources that serve as food** | **Earth’s resources that provide water** | **Earth’s resources that may provide shelter** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

* Brainstorm the connections between the senses and how other living things might experience the landscape. For example, if flowers are blossoming how would a bee sense the flowers? If there was a bird in a tree how might the bird sense the tree?

Task C: Predict the effect of seasonal changes on living things

Building on students’ understanding of seasonal changes and how the availability of resources can change (from Learning activity 1), discuss the following:

* Seasonal changes are predictable and living things depend on Earth’s resources that come with the changing seasons. Use a published seasonal calendar and predict what would happen to Earth’s resources if seasons changed at different times, for example, if high summer extended into April or early winter began in May.
* Discuss five resources that would not be available if the current season length for summer or winter was extended; for example, if summer was extended it would be too hot for fungi to grow or too warm for Antarctic birds to survive. Discuss other season-related ‘What if …’ questions in relation to the differing availability of various Earth resources from season to season.

Learning activity 3: Landscapes

Learning intentions

Students will be able to:

* explore what Earth resources are available during each season
* describe how Earth’s resources can be used in different landscapes and seasons
* identify different features of landscapes and how they change
* describe how Earth’s resources are used in a variety of ways
* predict changes to animal and human behaviour if Earth’s resource availability changes because seasons are no longer predictable.

Learning ideas

Task: Create a diorama of how Earth’s resources are used in different seasons

The level of scaffolding provided to students for this activity will vary depending on the cohort as well as whether it will be used as part of the learning program or as an assessment tool.

Materials and equipment

A box that can be segmented into two sections, such as a shoebox or a small supermarket cardboard box; materials to divide the box into two sections, such as cardboard, icy-pole sticks or plasticine; materials to model the features of a selected environment; paint; representation of themselves or a selected animal.

Construction of the first section of the box to represent seasonal features of a landscape

* Students divide a box into approximately two halves.
* Students select a landscape. The landscape might be one found on an earlier walk or one that they simply like, such as a billabong, desert, forest or beach.
* In one half of the box students design their landscape for a particular season. They include different elements of Earth’s resources, such as trees, creeks, rocks, plants and water, making sure that those elements look the way they would in their chosen season.
* Students can then include themselves or an animal of their choice.
* Students need to describe how they or their animal would use the resources found in their landscape at that time.

**Construction of the second section of the box to represent the features of the landscape in a different season**

* Students repeat the process as for the first section but change the season.
* Students need to:
* describe how they or their animal would use the resources found in their landscape with respect to the different season
* indicate the features of the landscape that have changed and those that have stayed the same
* explain how the resources in the environment meet their own or their animal’s needs
* describe what could happen if they or their animal was not able to use some of the resources they would normally depend on.

[Appendix 5: Sample response to an assessment task](#App5) shows how a teacher could use this task as an assessment task. It provides annotations of a student’s work against the following three elements of the relevant achievement standard for Science Foundation to Level 2:

* … identify and describe changes to objects, materials, resources, living things and things in their local environment
* … suggest how the environment affects them and other living things
* … describe how different places meet the needs of living things

Assessment ideas

Pre-assessment

It is important for teachers to determine students’ prior knowledge. This can be done during Learning activity 1: Task A when asking students to share their ideas on why we dress in particular ways depending on the season. Responses will give teachers a sense of whether students understand and can identify seasonal indicators such as hot and cold or wet and dry. During Task C students need to identify which of the objects they have added to the nature table could be used by humans. This will indicate if students have an understanding of how resources found in the environment can be used and how an object’s availability changes as the seasons do.

Teachers should also consider the content descriptions and achievement standard that are relevant to the content they are teaching. For example, in planning for assessment related to the Science Foundation to Level 2 content description ‘Earth’s resources are used in a variety of ways’ and the associated element from the achievement standard, ‘ … identify and describe changes to objects, materials, resources, living things and things in their local environment’, it would be useful to determine the extent to which students are already familiar, or unfamiliar, with terms such as ‘Earth’s resources’, ‘living things’ and ‘environment’.

Ongoing formative assessment

Each task in this resource has a series of questions for discussion – the answers to these questions should be documented. Questions and responses can be done with a ‘Popcorn Share’. A Popcorn Share is a method of receiving rapid responses from a variety of students. The teacher asks a question and names the first student to answer – that student gives their answer and then nominates the next person to answer. To encourage active listening, you can make a rule that no answer can be repeated; this ensures you will gather a variety of answers. If a student’s answer has been given when they are called on, or if the pressure of answering quickly is overwhelming, then students can say ‘pass’ and put their hand up at a later time when they are better prepared and more confident.

Teachers may also consider using ‘Desk Signs’ to monitor student learning when introducing new concepts, such as when interpreting Koorie calendars. Teachers may hand out cards with different coloured fronts and backs at the beginning of the class. Ask students to position their card to show one side at the beginning of the class, and when they understand the concept they can flip it to the other side. A quick glance at the cards around the classroom can tell the teacher whether more ‘unpacking’ of a concept is required or if particular students may need more assistance.

Summative assessment

Teachers should consider the relevant elements of the achievement standard that will be used as the basis of a summative assessment task. For example, for the Science Foundation to Level 2 content description ‘Earth’s resources are used in a variety of ways’, the relevant achievement standard element is ‘ … identify and describe changes to objects, materials, resources, living things and things in their local environment’.

One point to note in relation to this specific element of the achievement standard:

* ‘identify’ and ‘describe’ do not require that students apply higher order thinking skills such as ‘analyse’ and ‘evaluate’. Identification may involve a task such as one where students are given a set of pictures of Earth’s resources (for example, an ice cube, a banana, a rock, a ball of cotton wool and a leaf) and asked how these might look different in summer or winter and/or are asked for ways that each could provide food, water or shelter. In some cases, teachers may want to construct an assessment task that assesses more than one element of the achievement standard, such as that in [Appendix 5: Sample response to an assessment task](#App5).

Some of the activities in this resource can be adapted to become assessment tasks; for an example, refer to [Appendix 5: Sample response to an assessment task](#App5).

Appendices

Appendix 1: How is southern Australia different from northern Australia?

How is the weather and environment at your school (in southern Australia) different from the weather and environment at Kakadu, in northern Australia?

Write the name of each place in the top box. Draw the weather today in the bottom box. Use a word from the board to label each drawing.

|  |  |
| --- | --- |
| **Northern Australia** | **Southern Australia** |
| **K a k a d u** |  |
|  |  |

**Extension:** Write one or two sentences to describe what the climate is like in each place.

Appendix 2: Nature table predictions

Make predictions about how different non-living objects found in nature could be used by humans.

Use objects you have collected or draw them yourself.

**Season: ...................................................**

|  |  |
| --- | --- |
| **Non-living object (model or drawing)** | **Prediction of how humans could use it** |
|  |  |
|  |  |

Appendix 3: Dressing for the seasons

|  |  |
| --- | --- |
| **Season: ........................................** | **Season: ........................................** |
| Outline of figure of child | Outline of figure of child |

Image source: iStock.com/MaskaRad

Appendix 4: Sensing our place

At each location on your walk, stop and take time to answer the following questions. For example:

**Out in nature, what can I see?**

In the bush I see ants crawling up the peeling bark of a tree.

|  |  |
| --- | --- |
| **Out in nature, what can I hear?**   * Is it loud or soft? * Is it near or far? * Is it repeating or just once?   What might be making the sound?  In the ........ I hear the ......................................................... | **Out in nature, what can I see?**   * Is it moving or still? * Is it big or small? * Is it living or non-living?   What might it be? Draw a diagram or picture of it.  In the ........ I see the ......................................................... |
| **Out in nature, what can I smell?**   * Is it strong or faint? * Is it wet or dry? * Is it everywhere or coming from one place?   What might be the source of the smell?  In the ........ I smell the ....................................................... | **Out in nature, what can I feel?**   * Is it wet or dry? * Is it soft or firm? * Is it rough or smooth?   What am I feeling?  In the ........ I feel the ......................................................... |

Appendix 5: Sample response to an assessment task

Joe’s model:

Photograph of model that contains fence made with icypole sticks, plastic trees, ground painted yellow, brown 'caves' and green 'vegetation'.


Joe’s written response:

**How does a dingo use Earth’s resources in different seasons?**

Where there is lots of vegetation is spring and the other side of the fence is summer.

Summer means not much rain (Earth’s resource) which means a lack of vegetation.

The rocks have not been affected by seasons.

There are no caves for dingo pups in the summer.

Relevant elements of achievement standards being assessed:

* … identify and describe changes to objects, materials, resources, living things and things in their local environment
* … suggest how the environment affects them and other living things
* … describe how different places meet the needs of living things

Teacher annotations

Joe has:

* identified that the environment changes with the seasons by showing that there are different features on the land in summer compared with spring, with the two seasons being visually separated by a fence (made from icy-pole sticks in the diorama, but cardboard could be used)
* identified that seasons affect the availability of Earth’s resources by showing that in spring the land supports trees (represented in the diorama by plastic trees) and grass (represented in the diorama by curled-up pipe cleaners) while in summer it is too dry for these plants to grow, as well as stating that in summer rain is not available as a resource
* identified what dingoes need for shelter (in the diorama, he included ‘rocks’ for shelter, and constructed caves from felt to represent dens to raise dingo pups)
* identified that some things change between seasons (for example, there are no trees or grass in summer; dingoes have pups) while other things do not change (for example, rocks)
* shown an understanding of resource availability and how it affects the dingo’s life by describing a lack of caves for pups to shelter in during the summer.

Where Joe could improve:

* How Earth’s resources provide water and food for the dingoes could be included.
* Also, it is not clear from Joe’s model or his written response whether the trees and grass are used for shelter, food or other purposes.