In this unit, students investigate different points of view, past and present, about the seasons in Australia.

Many people believe there are four seasons and that this is just the way it is. Some believe that all Indigenous Australian cultures have six seasons. Neither of these statements is quite true: there may be three seasons to a member of the Mirriwoong people of the Northern Territory, four to someone of European origin, and six to a member of the Brambuk culture of Western Victoria. Some seasons come every few years, such as the Kulin fire and flood seasons. Seasons relate to climate but they also relate strongly to culture. The question ‘How many seasons are there?’ allows us to explore understandings about the past and the present. What assumptions did European explorers and settlers make about the land when they chose locations for settlement? How did their need for food crops rest on these assumptions – and what were the consequences of misinterpreting the land?

Students explore Indigenous seasons and food cycles. They discuss the observational knowledge on which Indigenous seasons are based, and compare them to the European calendar-based system in which each season is a tidy three months long. (Here we can also bring in weather data should you need to add a numeracy and statistical/data element to the unit.)

Students create their own circular calendar, or cycle of the seasons, documenting their point of view and using their documented experiences to compare and contrast with accounts from the past. History, like seasons, can mean different things to different people.

The seasonal cycle calendars can be used in many ways, such as inspiration for artworks, discussion points for storytelling, points of contact and contexts to ask questions of the local community and Elders, even as an alternative way to plot and interpret annual weather data in our locality.

**Curriculum Links**

**Science**
- The Earth is part of a system of planets orbiting around a star (the sun) (Yr 5, ACSSU078)
- Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the sun, the Earth and the moon (Yr 7, ACSSU115)

**Geography**
- The influence of the environment on the human characteristics of a place (Yr 5, ACHGK028)
- The world’s cultural diversity, including that of its indigenous peoples (Yr 6, ACHGK033)

**Design and Technologies**
- Investigate food and fibre production and food technologies used in modern and traditional societies (Yr 3–4, ACTDEK012)

**Mathematics**
- (optional) Describe and interpret different data sets in context (Yr 5, ACMSP120)

**Cross-Curriculum Priorities**
- Aboriginal and Torres Strait Islander histories and cultures
- Sustainability

**Teacher’s note**

This unit is an excellent complement to the ‘Earth, Moon and Sun: Night and Day’ unit in the companion book *Tools for Teachers 4 – Years 3&4*. That unit focuses on the planets; this unit focuses on what seasons mean to culture and history.
**Seasons and Cycles**

**Seasonal line-up**
- The European calendar divides the year into four seasons: spring, summer, autumn and winter. This convention was first established in Northern Europe.
- Ask students whether they think we always have four seasons here where we live. What’s their experience?
- Get students to line themselves up along one wall of the classroom, or similar if outside, according to the season of their birthday. Begin with early spring at one end, then have the line progress through spring, late spring, summer, autumn and winter, ending at late winter. Don’t mention months or dates or define precise points between seasons – if you’re a bit ambiguous, students will be forced to work out a continuum for themselves.
- Give them 2–3 minutes to make a seasonal birthday line-up.
- Did students find this task difficult? Were there difficulties defining the seasons?
- The definitions of spring, summer, autumn and winter mean different things to different people.
- Discuss your thoughts about how dates and seasons can change from year to year with the weather.
- Encourage anyone in the line-up who wants to move, to move.
- If you have the space, get the students to walk their line into a circle to show how the seasonal cycle of the year repeats itself.

**Seasons and latitude**
- As a class, look at a map of Australia and compare the latitude of different places.
- Does summer come earlier the further north you go, or the further south? What else affects the seasons? (Proximity to water bodies, for example.)
- Ask: If we were in Darwin/Hobart/any place on the other side of Australia your students know of, would our birthday seasonal line-up look the same? (Use climate data if you need to.)
- Discuss what changes occur when we compare our line-up to another latitude. If we were in the northern hemisphere, our line-up would run the opposite way.
- Discuss and ask questions until your students see that seasons are not absolute, they depend on your location and climate.
Starting personal seasonal cycles

- Ask: what dictates the annual cycle? (The Earth’s orbit around the Sun.)
  If you need to review this concept, review it now.
- Provide each student with a seasonal cycle template (a template is provided for you on page 18 or in the Shared Table Resource Library).
- Working individually, students plot key moments on their circular calendar, such as their birthday and those of friends, term dates and events of personal importance, such as summer holidays, Chinese New Year, *Eid-ul-fitr*, Christmas, key sporting events or seasonal fairs and shows.
- Students don’t need to be too specific about plotting dates; this activity is about understanding seasons rather than recording specific days within months.
- They can use symbols, colour-coding, icons, stickers or dots, and create a legend.
- Ask students to tell you about seasonal changes in the natural world.
  Different schools will pose different questions: When do the termites appear? What time of year was it when we planted the broad beans? When do our chickens moult? When the winds come, what season is it? What about the rains? When do we worry about frost on fruit tree blossom?
- Probe and tell stories with students and others, such as the kitchen and garden volunteers and wider community, to facilitate students building a personal picture of their knowledge of seasonal cycles in nature.
- On their seasonal cycles, students add any of the observations, events or stories that have personal meaning to them, such as when certain bush foods are ready or when favourite foods come into season. An example is provided on page 20.
- Students could create a food dial around the outside of their cycle with names or images of the fruit and vegetables available in each season. The circular format emphasises the cycle of the seasons, which a rectilinear calendar can disguise.

Extension

- You might organise a collaboration at any point in this unit with a class in a different climate zone, such as another part of Australia. To find connections, try asking another Kitchen Garden School to partner with you via the Shared Table. Your exchange might take the form of a Skype call, or students in each class could take videos and post photos with questions for each other about the current season and footage of their gardens.
Indigenous Seasons

Year levels 3–6

Curriculum Links

Geography
- The influence of the environment on the human characteristics of a place (Yr 5, ACHGK028)
- The world’s cultural diversity, including that of its indigenous peoples (Yr 6, ACHGK033)

Design and Technologies
- Investigate food and fibre production and food technologies used in modern and traditional societies (Yr 3–4, ACTDEK012)

Cross-Curriculum Priorities
- Aboriginal and Torres Strait Islander histories and cultures
- Sustainability

Resources
- Students’ Seasonal Cycles from the Seasons and Cycles lesson
- Computers or devices with internet access
- Resources relating to Indigenous seasons in your area. A few links are provided at the end of this unit, listed by state, but of course this is a complex subject and local people are far better resources than the web.

Location
The classroom

Duration:
45 minutes

Teachers’ note

If you can invite a member of a local Indigenous community to speak to your class about the seasons, this lesson will be much stronger and more relevant. Online resources are provided where this isn’t feasible.

Seasons ‘from here’

- Discuss the two meanings of the word ‘indigenous’ – one of which is ‘grew here’ or ‘from this place’, and the other refers to the original people of this place, their cultures and knowledge of the land.
- Indigenous seasons can be said to have both meanings: they come directly from the land and climate of each place, and they have been articulated and defined by Indigenous peoples.
- The many different Indigenous cultures of Australia divide the year in a variety of ways, relating to the cycles in local food sources and the cycles in their environment.
- For example, there are three seasons to the Mirriwoong people of the Northern Territory, and six to the members of the Brambuk culture of western Victoria. How many seasons depends on who you ask.
- Ask students whether a year with seven seasons is longer than a year with four. (The length of a year is defined by the planets, but the length of seasons is defined by people.)

Exploring Indigenous seasons

- Individually or in groups, explore the Indigenous Weather Knowledge website at the Bureau of Meteorology: www.bom.gov.au/iwk. This site provides details about the seasons as recognised and described by nine different Indigenous cultures in Australia.
- If you can use local data or are able to welcome guests from a local Indigenous group, this will be a much stronger and more authentic discussion.
- Students’ seasonal cycles are an excellent way to begin conversations about what happens throughout the seasons in nature and in our gardens.
- What knowledge can be added to students’ experiences of the garden? For example, students may know that certain birds visit the garden but a local visitor may be able to elaborate when and why they come (for example, the currawongs are vocal in spring, the pardalotes nest in August, the Pacific koel comes before the rains).
- Students modify their seasonal cycles to add as many items or rings as they need to reflect what they have learnt about the Indigenous seasonal cycle in their area.
Going further

- Later you could provide students time to create a final copy from their first drafts; some students make their seasonal cycles quite complex and detailed!
- Encourage students to take their cycles home and ask family and community members for input into seasonal observations. Each student’s cycle will be different.
- Students could make large copies of their own seasonal cycles as desk mats.
- Students’ independent seasonal cycles can be developed into personal statements of their identity and heritage.

Extensions/Variations

- A large version of a class seasonal cycle can be created on the ground in the garden or other outdoor space. This could be formed from sticks and dried leaves, stones or sand, with items such as seed pods placed as symbols to represent items the students discuss.
- An advantage of a large-scale cycle is that the community can be invited to come and view, sit within and move or modify the cycle as they tell stories. This can be a way to empower the oral traditions that relate to seasonal cycles in our community.
- The cycles can inspire temporary or permanent artwork for the garden space or elsewhere in the school.
How Many Seasons are There?

Getting started

- Remind students of the Indigenous Seasons lesson. When we started, we said that the annual four-season convention came from Northern Europe.
- Ask students: How did this idea come to Australia?
- Would everyone in Australia agree with this idea? What about the traditional inhabitants of the land? When the first European explorers arrived, did they have the same opinion about seasons in Australia? Why or why not?

Solstices and equinoxes in context

- When European explorers came to, and began settling, Australia, the European world was in the middle of a period of enthusiasm for scientific discovery, known as the Age of Enlightenment or the Age of Reason.
- The enthusiasm for astronomy was strong. Astronomical observations were not only providing data about the movement of the planets but also contributing to navigation. Explorers had to be astronomers too, and the purpose of many expeditions was to make astronomical observations.
- The seasons are formed by the relative position of the Earth and the sun. This video shows the orbit of the Earth around the sun and how the seasons are created: www.youtube.com/watch?v=q4_-R1vnJyw
- While Europeans were making more and more accurate observations of the movement of the planets, certain key dates in the year had been observed for centuries, even millennia.
- These key dates are the shortest day of the year, the longest day of the year and the days in which day and night are equal in length. The shortest day is the winter solstice, the longest is the summer solstice, and the two equal days are the equinoxes.
- Further detail about solstices and equinoxes is provided on the next page.

Curriculum Links

**Science**
- The Earth is part of a system of planets orbiting around a star (the sun) (Yr 5, ACSSU078)
- Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the sun, the Earth and the moon (Yr 7, ACSSU115)

**Geography**
- The influence of the environment on the human characteristics of a place (Yr 5, ACHGK028)
- The world’s cultural diversity, including that of its indigenous peoples (Yr 6, ACHGK033)

**Mathematics**
- (optional) Describe and interpret different data sets in context (Yr 5, ACMSP120)

**Cross-Curriculum Priorities**
- Aboriginal and Torres Strait Islander histories and cultures

Resources

- One or two current calendars that show the solstices and equinoxes
- Copies of students’ draft seasonal cycles
- Computer or devices with internet access
- (optional) Climate data for your area from www.bom.gov.au/climate or garden class observations

Location

The classroom or outdoors

Duration:

20–45 minutes, depending on whether or not you complete the extension

Stephanie Alexander Kitchen Garden Foundation © 2014
Solstices and equinoxes

The Earth orbits the sun. Its orbit is not a perfect circle but is slightly elliptical (oval-shaped).

The equinoxes are the two dates when the sun crosses the plane of the Earth’s equator, meaning on these days the Earth experiences equal hours of daylight and night. The equinoxes occur around 21 March and 22 September each year.

The solstices are the shortest and longest days of the year. These dates occur around 21 June and 22 December each year.

These dates have been incredibly important to many civilisations throughout human history because these observable phenomena are used to track the cycles of the year (Stonehenge is a well-known example of this).

Astronomers define the seasons by dividing the year into four equal parts, defined by the equinoxes and solstices. This is a tidy system for astronomy, but it doesn’t match the weather data for most of Australia. Even in locations with four clear seasons in a year, the hottest and coldest weather lags a few weeks after the summer and winter solstices. Dates on calendars mark these ‘official’ first days of spring, summer, autumn and winter, but they are astronomical definitions rather than earth-based climatic or weather observations.

Solstices and equinoxes

- Students use a current calendar to identify the dates of this year’s solstices and equinoxes (they can change slightly from year to year).
- On their seasonal cycle, each student marks the solstices and equinoxes.
- Discuss: An astronomer would tell us that the seasons should fit neatly around these dates. Looking at their cycles, students count how many months each astronomical season would last (three).
- Organise the class into small groups.
- In groups, students use their cycles to answer this question: Does our experience support or contradict the notion that there are four seasons of exactly three months in every year? Relate your response to evidence on your seasonal dials.
- Give the groups five minutes to prepare a response. A spokesperson from each group presents their response, including three pieces of data from their seasonal cycles that provide support for their response.

Extensions

- Provide each group with climate data for your area. There are data sets on the Bureau of Meteorology site at www.bom.gov.au/climate under ‘weather and climate data’, or if you have weekly observations from your garden classes they would be ideal.
- Ask students to decide how to plot the data onto their cycles (or onto a new cycle if they request one). In their response to the above question, students use the weather data to support their argument.
Seasonal Cycles – Resources for Teachers

Introductory resources

- Five Seasons is a fabulous short online film clip from Australian Screen: ‘Every season has a song – and we sing to the Country which feeds us.’ Excellent introduction to social seasons.
  
  http://aso.gov.au/titles/documentaries/5-seasons/clip1

- The Breathing Earth is a great way to illustrate astronomical seasons. Images from space show the advancing and receding ice around the North Pole over the course of a year.
  
  www.thisiscolossal.com/2013/08/breathing-earth

Indigenous seasons across Australia

- The Indigenous Weather Knowledge website at the Bureau of Meteorology contains links to several seasonal calendars from around Australia: www.bom.gov.au/iwk

- A comparison of several Indigenous seasonal descriptors with European seasons and months:
  

- ‘Should Australia Have Five Seasons?’ An article arguing for a fifth season, from Australian Geographic. Includes seasonal cycles from Indigenous groups in NSW, WA and the NT.
  
  www.australiangeographic.com.au/journal/should-australia-have-five-seasons.htm

- Interactive Food Wheel of the Dampier Peninsula, WA – is an online interactive wheel from the Edge of Nowhere Foundation. It is an interesting tool aligning Indigenous flowering and fruiting food sources with seasonal names.
  
  eon.org.au/materials/interactive-food-wheel

- The Seven Seasons of the Kulin People from Museum Victoria: ‘Each season is marked by the movement of the stars in the night sky and changes in the weather, coinciding with the life cycles of plants and animals.’ Two additional seasons are ‘Flood season’, and ‘Fire season’, which occur about every 28 and 7 years respectively:
  

- An excellent article about the Kulin people’s seasons on journalist Michael Green’s site:
  

- An article from Monash University about the seasons of the Wurundjeri people of the middle Yarra region, Victoria:
  

- An account of the six seasons of the Noongar people of Western Australia on the City of Mandurah site:
  