Weather data representation

*Please refer to the online lesson plan on the DT Hub to access all website links and additional resources.*

**Years 1–2** In this lesson, students explore various ways to share ideas and information, including using pictures, words and symbols. They also learn about First Nations perspectives on weather, represent weather data, and compare different representations of weather symbols.

# Language note

We have chosen to use the terms ‘Aboriginal and Torres Strait Islander’ and ‘First Nations Australian’ throughout this resource to align with the language used in version 9.0 of the Australian Curriculum. We also use ‘First Nations Traditional Owners’, as this is Tania Taylor’s preference. We acknowledge that this may not be the preferred term for the First Nations Peoples where your school resides. Educators and leaders are encouraged to engage with First Nations Traditional Owners of the land you reside on to clarify preferred language.

# About the authors

**Tania Taylor**

Tania Taylor is a proud Kaurna, Narrunga and Ngadjuri woman with nearly 20 years’ experience in community development and engagement, mentoring, education support, program design and strategic planning. She has served her community as an active board member of the Kaurna Yerta Aboriginal Corporation for eight years. Tania’s knowledge and experience includes working with Aboriginal communities in metropolitan areas, in a range of settings across Australia.

**Kim Martin**

Kim Martin is an accomplished educator, with expertise in inclusive learning technologies. She has held various teaching and leadership roles in the education sector, non-profit organisations and education technology companies across South Australia. Kim's commitment to education through technology is exemplified by her accolades, including 2014 ACCE Educator of the Year, and recent recognition as the 2023 EdTechSA Leader of the Year. Her passion lies in harnessing technology to facilitate differentiated learning experiences enabling learners to demonstrate their knowledge and understanding. Kim is a non-Indigenous collaborator.

# Engaging with Aboriginal and Torres Strait Islander communities

## Protocols for engaging with Aboriginal and Torres Strait Islander communities

Consider inviting an Aboriginal or Torres Strait Islander community member to your class. They can share insights and experiences of travelling to visit family on Country from their perspective. When approaching community members, including Elders, please be mindful that not all possess knowledge relevant to your learning outcomes. As individuals, just like everyone else, they have diverse specialties and interests. It cannot be assumed that they have the authorisation or a willingness to share their knowledge.

In the learning environment, fostering positive experiences with Aboriginal Peoples and Torres Strait Islander Peoples is crucial for promoting attitudinal change and building respectful relationships. Inviting active involvement of Aboriginal and Torres Strait Islander Peoples in all stages of your program development by employing them as guides and experts, not just guest speakers, can provide valuable learning experiences that enrich your and students’ knowledge and awareness beyond the individual lesson shared here. Before you invite guests from Aboriginal or Torres Strait Islander communities to your school, first seek out information about proffered protocols for engaging with Aboriginal or Torres Strait Islander Peoples on your Country. Local government websites often have guiding information to help you. Common considerations include the negotiation of dates, time and duration, and payment rates well in advance, and ensuring that the visitor has transport arrangements.

We recommend referring to your state or territory education governing body for context and guidelines regarding culturally respectful practices. Here are a few links to get your started.

* SBS: Aboriginal and Torres Strait Islander Protocols Guide – for Teachers
* Culture is Life: Teaching First Nations Knowledges & Perspectives
* Beyond Blue | Be You: Culturally respectful engagement for learning communities

## Cultural safety

Every child has a right to feel safe at school. Creating safe conditions for learning involves providing supported yet challenging environments to enable high-quality learning opportunities. Cultural safety, defined as an environment that is spiritually, socially and emotionally secure (Williams, 1999), is crucial. It encompasses shared respect, meaning and knowledge, and the experience of learning together with dignity. In classrooms, recognising the diverse life experiences and knowledges of Aboriginal and Torres Strait Islander children is essential, acknowledging that each student's connection to and understanding of their histories and cultures varies. Caution is advised when requesting students to share information, as they may not possess the knowledge, permission or comfort to do so, causing cultural load for the student. In interactions involving First Nation Australian historical and cultural contexts, establish ground rules for respectful discussions and behaviours, considering the complexity and sensitivity of each student's identity and cultural connection.

Reference

Williams, R. (1999). Cultural safety: What does it mean for our work practice? *Australian and New Zealand Journal of Public Health*, *23*(2), 213–214. https://doi.org/10.1111/j.1467-842X.1999.tb01240.x

## Indigenous Cultural and Intellectual Property

‘Indigenous Cultural and Intellectual Property [ICIP]refers to the rights that Indigenous people have, and want to have, to protect their traditional arts and culture’ (Arts Law Centre of Australia).

The lesson ideas and discussion prompts are designed to support teachers in facilitating learning opportunities that help students’ understanding of First Nations Australian ways of knowledge and perspectives within the curriculum area of Technologies, specifically the Digital Technologies subject. We see many opportunities for integrated learning across all learning areas including English, Mathematics, the Arts, and Humanities and Social Sciences (HASS).

Learn more: ICIP information sheet.

# Learning hook

Download the teacher’s slides to support your teaching.

* Discuss the way weather information is commonly presented. Display weather symbols commonly used in the media. Slide 2 has an example of icons from a television news broadcast.
* Read to the class the book, Thank you rain! by Sally Morgan and illustrated by Johnny Warrkatja Malibirr. Alternatively, watch this video by Wooyal Dreaming (slide 3), retelling the story.
* Discuss elements of the story, such as the similarities and differences of the environment and weather in the book compared to where your community live.
* Discuss the illustrations and how they help the reader understand the story and the environment.
* Lead a discussion about why people might like to know what the weather is going to be for a certain time. How is this information conveyed?

## Learning map and outcomes

### Learning intentions

Students will:

* explore how data can be represented in a variety of ways
* use symbols and sounds to represent the weather.

**Success criteria**

Students can:

* design their own icons to depict different weather events
* interpret different sources of information (image, sound, number, text) and what they may represent.

# Learning input

* Share Tania’s weather symbols (slides 4 to 8) with the class and discuss how she has represented weather types as symbols as part of art. The weather symbols drawn by Tania are linked to her knowledge of weather where she and her family have lived on Kaurna, Narrunga and Ngadjuri Country. Ask students to identify the meaning (weather type) of each image.
* Discuss weather represented by sounds. Use the sounds in slide 9 to discuss the way sounds can be used to represent the weather, for example, mosquitoes and flies buzzing can relate to a sunny day.
* Discuss the western view of seasons using the terms summer, autumn, winter and spring.
* The slides include discussion about seasons starting from the way we typically use summer, autumn, winter and spring and how that might relate to students. A First Nations Australian view on seasons is introduced to explore their weather knowledge and the clues used to know a new season was coming. (Slides 10-11). Two videos are provided to help discuss what these clues are and how these relate to Country.

Ask students:

* + what images they would use to help someone understand a season
  + what their favourite season is and why
  + if there are certain activities you do only at a particular time of year, clothes you would wear at that time, places you would tend to visit, foods you would eat
  + if they can think of any environmental indicators/clues that might show a new season is coming.
* Explain that First Nations Australians use many different clues to know when a new season is coming. Depending on the location in Australia, signs of a new season approaching may include:
  + particular plants start growing or flowering
  + specific fruits and food sources become more readily available; depending on where they are, this could include kangaroo, fish, yabbies and plant-based foods
  + winds predominantly coming from a particular direction
  + baby animals start appearing
  + the sun in a particular part of the sky
  + different stars closer to the moon or different place in the sky
  + temperature changes.
* Use relevant resources such as the BOM’s Indigenous weather knowledge, which maps seasons on Country to the Australian calendar.
* Invite a First Nations local community expert with weather knowledge of the area to speak with your class and answer students’ questions about weather and environment for the Country you live, learn and play on.

# Learning construction

* Using new knowledge about First Nations weather knowledge and symbols, invite each student to create their own icons for the weather types shown on slides 4 to 8, for example; sunny, rainy, windy, stormy and cloudy/overcast. The symbols students create do not need to be be the same as the examples presented but should be recognisable so that the information conveyed is represented accurately and easily interpreted.
* Discuss words commonly used to describe different types of weather, for example, ‘In winter the weather might be rainy, snowy, frosty, cloudy, sunny, stormy or windy’ or, ‘In the wet season the weather might be rainy, humid and stormy’.
* Ask students to complete a weather watch for a week, predicting the weather for the day in the morning and keeping a record of what the weather was at the end of the day. Students can use a table with days of the week listed and space to record symbols, which might include photos, symbols, voice recordings and numbers.

# Learning demonstration and reflection

* Once students have created their own weather symbols, either hand drawn or using a digital medium, provide an opportunity for students to share their work with peers.
  + Ask students to consider what they notice about each other’s weather symbols.
  + What is similar? What is different?
  + Are there elements of someone else’s symbols that you think help to make it clear?
* If you have arranged for a local First Nations Australian to visit your classroom, share the students’ work with them. Ask them about other ways information is represented and shared in their culture, for example, through dance, dreaming and storytelling, or when symbols might be used in situations other than the weather.
* The slides include discussion about seasons starting from the way we typically use summer, autumn, winter and spring and how that might relate to students. A First Nations Australian view on seasons is introduced to explore their weather knowledge and the clues used to know a new season was coming. (Slides 10-11). Two videos are provided to help discuss what these clues are and how these relate to Country.

# Teacher cultural competencies

* Aboriginal and Torres Strait Islander community members, including Elders, do not hold knowledge on all topics. You will need to be specific about your lesson or unit goals and the Aboriginal knowledge and perspectives you are interested in focusing on with the support of the community member to ensure you develop a reciprocal relationship with First Nations Australians who have the knowledge and experience to support your teaching and learning program.
* First Nations people have their own way of understanding the world around them. Please contact your local First Nations community and/or Aboriginal Education Officers to access relevant, local Indigenous Knowledge and weather information. For example, the Kaurna calendar (Adelaide, SA) has four distinct weather periods in their seasonal cycle, whereas the Yawuru calendar (Broome, WA) has six seasons. Each area will also have specific local environmental indicators.

# Differentiation

* Learn about current First Nations Australians having a positive impact on climate change. This website might be a good place to start: Climate change A NSW Government website.
* Ask students to be symbol detectives and record all the symbols and icons they see in a day or a week in a journal. Have them reflect on whether they could easily identify what each meant or whether some were confusing or didn’t make sense and they had to ask an adult for help understanding the meaning. An extension of this might be to label each icon or symbol drawn with a word in their journal.
* Use weather symbols created by students as part of the morning routine to forecast the day’s weather.
* Organise an excursion to a local natural environment with a local First Nations person with weather knowledge and have them share seasonal changes impact on environment.

# Resources

* Teacher’s slides: Data Representation-weather
* Video: Junior Landcare 2022: Local Seasons: exploring First Nations weather knowledge Landcare Australia, Accessed January 07. 2024
* Video: The Different Seasons in Australia's Indigenous Cultures - Behind the News (YouTube: Behind the news, Australian Broadcasting Corporation (ABC))
* Australian Bureau of Meteorology (2016) Indigenous Weather Knowledge , Accessed January 03, 2024.
* Australians Together (n.d.) Comparing Indigenous and Western concepts of seasons, ordering Western months and understanding seasonal cycles, Year 2 Maths Teacher Guide , Accessed January 07, 2024
* Data Representation Infographic Digital Technologies Hub (2023), Australian Government Department of Education
* Christophersen, J. (2005) My Home in Kakadu , Magabala Books, Australia
* CSIRO (n.d.) Indigenous seasonal calendars , CSIRO, Accessed January 07, 2024
* Logan, T. (2023) Guided by Nature , Australian Broadcasting Corporation (ABC) News, Accessed January 07, 2024
* Martin, K. (2024) Guess the emoji emotion , Kahoot Quiz, Accessed 8 January 2024
* Morgan, S. and Warrkatja Malibirr, J. (2022) Thank you rain! , Magabala Books, Australia
* Thank you rain! - Dreamtime story read aloud! Written by Sally Morgan and illustrated by Johnny Warrkatja Malibirr. (3:20 min)
* Wheeler, C. (2022) Thank you Rain! Teacher Notes , Magabala Books, Australia, Accessed January 03, 2024.
* Wooyal Dreaming (2023) Thank you Rain! Dreamtime Story read aloud , Accessed January 07, 2024.

# Australian Curriculum

## Digital Technologies

Achievement standard

By the end of Year 2, Students represent and process data in different ways.

### Content descriptions

### Students represent data as pictures, symbols, numbers and words (AC9TDIFK02)

## Related content

**Science** Year 1

Science Understanding: Earth and Space Sciences: describe daily and seasonal changes in the environment and explore how these changes affect everyday life (AC9S1U02)

**Mathematics** Year 1

Statistics:acquire and record data for categorical variables in various ways including using digital tools, objects and images, drawings, lists, tally marks and symbols (AC9M1ST01)

**HASS** Year 1

Questioning and researching:collect, sort and record information and data (AC9HS1S02)

## Cross-curriculum priorities

**Aboriginal and Torres Strait Islander Histories and Cultures**

* **Culture**

First Nations Australians’ ways of life reflect unique ways of being, knowing, thinking and doing. (A\_TSIC2)

* **Country/Place**

First Nations communities of Australia maintain a deep connection to, and responsibility for, Country/Place and have holistic values and belief systems that are connected to the land, sea, sky and waterways. (A\_TSICP1)