Algorithms: storytelling sequence

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 will explore a story by an Aboriginal or Torres Strait Islander author that has a sequence that can be followed. Students will sequence the main elements or steps in the story in their own way and share with peers.

# 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, in a range of settings level 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-Aboriginal collaborator.

# Why this is relevant

An algorithm describes a sequence of steps and decisions to achieve a desired outcome. At this level it can be spoken as instructions, written as a list or presented as a series of images.

Students learn to describe, follow and represent an algorithm by following instructions given by someone else, then practise giving their own instructions. They learn computational thinking skills by having multiple opportunities to break down a problem into smaller parts or steps.

# 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.com.au: Aboriginal and Torres Strait Islander Protocols Guide – for Teachers
* CultureisLife.org: Teaching First Nations Knowledges & Perspective
* Beyond Blue | BeYou.edu.au: 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 in Williams (1999) as an environment that is spiritually, socially and emotionally secure, 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 Nation 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, Arts, and Humanities and Social Sciences (HASS).

Learn more: ICIP information sheet (refer to online lesson)

# Learning hook

* Read a story by an Aboriginal or Torres Strait Islander author that has several clear steps in the story sequence and a connection to First Nations Australians.
* If you have access to an Elder or suitable story for this age range from the First Nations Australians of the Country your school is a part of, prioritise this story.
* In this lesson we have chosen the story *On the Way to Nana’s* by Frances and Lindsay Haji-Ali. Read the story*.*
* Discuss the elements of the story. For example:
	+ What things did the child in the story see on the trip to their grandmother’s house? How are the things different from what you would see on the way to visiting one of your family members?
	+ Where has your family gone for a day trip? How is your experience the same as in the story?
	+ Was there any repetition in the story? Did this help you predict what was going to happen next? Were there any other patterns in the story that helped you predict what might come next; for example, counting, and rhyming sentences at the end of each page?

## Learning map and outcomes

Explain that an algorithm is a list of steps that can be followed to complete a task.

### Learning intentions

Students will:

* design a sequence of steps (using words and symbols) for others to follow
* follow and describe algorithms.

### Success criteria

Students can:

* retell details of a story
* evaluate an algorithm of their own and one by a peer, and consider if there are details missing that could improve the outcome
* compare and contrast the events in a story to their own experiences
* recall and record main parts of a story in their own way; for example, with spoken or written word, images or a combination of expressions.

# Learning input

* Model the recalling of the steps of a journey by retelling a (fictional or true) story about a holiday. While the teacher recalls the steps of their journey, they are modelling recording them. This could be as a list, a drawing on a map or using icons or simple drawings.
* As a class, work together to discuss and record the steps in the process to get to school in the morning. Families will each have slightly different procedures for getting their children to school – discuss this and identify what elements are similar; for example, getting out of bed, getting dressed, getting school bag and lunch ready, getting to school (drive, walk, ride a bike) and bringing in items from your bag into the classroom so that you are ready to start the school day.

# Learning construction

* Ask students to create story maps individually or with a friend based on the story *On the way to Nana’s*. This is an early skill that will develop into flowcharts as a way of writing algorithms in future schooling years. Allow the students to record their story map in a way that makes sense to them. This may include lines, drawings, icons, words and numbers. There is a ‘mud map’ illustration on the inside cover of the book *On the way to Nana’s* that can be used to support this activity.
* Provide students with the worksheet *On the way to nana’s story sequence* to scaffold their recording. This may support students to recall the main parts of the story using their own drawings, numbers and words. The boxes can be cut out so the students can move them around into the correct sequence. This task could also be completed as a digital activity using Seesaw or an app such as Tayasui Sketches School, Keynote, PowerPoint or Book Creator. These digital tools enable multimodal input and output; for example, voice recording as well as a student’s drawing.

# Learning demo

* Once students have completed the story sequencing task or story map, either unplugged or digitally, allow them to share their work with peers. Ask students to consider what they notice about each other’s story maps. What is the same? What is different? Are there elements in a class member’s story map that you missed? Allow students an opportunity to edit and improve their initial ideas.
* Reinforce the sequencing of steps and counting by learning how to play a traditional game called knucklebones. Knucklebones can be played individually or in groups of three of more. View knucklebones game instructions. For information about the history of knucklebones and its connection to First Nations people refer to the Resources section.
* If you have arranged for a local First Nations Australian to visit your classroom, share the students’ work with them, and ask them about trips to visit family.

# Teacher cultural competencies

If you engage with First Nations Traditional Owners, please ensure that you are aware of correct protocols for developing this relationship. Reaching out to your local council and the First Nations Traditional Owners in your area to request information regarding guiding protocols is recommended. Your school may also have guidelines to support you to develop this relationship. AIATSIS and ACARA also provide some guidelines that may be helpful.

The story *On the way to Nana’s* is co-authored by Lindsay Haji-Ali, who is a descendant of the Yawuru/Karajarri people of the West Kimberley region of Western Australia.

If you as a teacher decide to introduce First Nations language to support students’ learning about this story and region, it is important that you recognise the specific language used by the Yawuru/Karajarri people of the West Kimberley region. However, if appropriate for the location of your school, please use the language of First Nation(s) Traditional Owners relevant for your region to describe the landscapes, animals and objects connected to children’s observations. It is important for you as a teacher to be aware that the reclaiming of a language silenced after invasion is a process that has resulted in alternative spelling and changes to language as more evidence is uncovered. Learning of a First Nations language should be done in collaboration with someone from that language group. This includes checking on preferred spelling and pronunciation of words.

'Since 1788, most of the traditional languages have ceased to be languages of everyday communication because many Aboriginal and Torres Strait Islander Peoples were forced to stop speaking their languages as a result of government policies aimed at assimilating communities into the non-Indigenous population.' (ACARA 2021)

'Many colonial attempts to document First Nations languages and cultures introduced inaccuracy and misrepresentation. This includes inaccurate spellings for names, nations and locations.' (Australian Government 2021)

# Learning extension and/or differentiation

* HASS and Mathematics extension: Look at a map, the AIATSIS map or Google Maps, of the region where the *On the way to Nana’s* story is set – a journey from Broome to Wyndham, more than 1,000 kilometres at the top of Western Australia in the Kimberley region. Compare it with the mud map in the story. How could you estimate how long the car trip was for the family in the story? What is the environment like? Would they really see the animals and landscapes described in the book? How is the environment different from or like where your live?
* Practise sequencing with a recipe that uses bush tucker or native plant elements from Country your school is situated on.
* Think about what is special about an older person in your family. Create a portrait of them using a medium of your choice.
* Invite a local First Nations Australian to visit your classroom to share stories about their family trips. (There may be a fee for this service.)
* Ask a grandparent to share a recipe with you and arrange to prepare the food together. Take a photo or video to share with your class.
* Book a local First Nations Australian to visit your class and share a recipe from their culture. (This may incur a fee.) Are some of the ingredients new to you? Ask students to record the steps they can recall from the recipe and process. This may be completed with words, images or numbers, or a combination of expressions.
* Discuss as a class how this story might change if we were to consider the perspective of another passenger in the car; for example, Mum or the driver.
* Teacher can model recalling steps with a simple task such as brushing teach or arriving at school in the morning. Then students record the sequence of a task based on an activity that has meaning to them.
* Other teaching and learning themes for the story *On the way to Nana’s* may include counting, family relationships, grandparents, geography, landscapes and travel.
* Learn the steps needed to play a traditional Aboriginal or Torres Strait Islander game. Check out the Yulunga site. https://www.sportaus.gov.au/yulunga

# Resources

* Worksheet On the way to nana’s story sequence
* On the way to Nana’s by Frances and Lindsay Haji-Ali, illustrated by David Hardy
* On the way to Nana's By: Frances Haji-Ali, Lindsay Haji-Ali, David Hardy (STORY LAB - Read Aloud)
* Alternative story: Crabbing with Dad by Paul Sedan
* AIATSIS: Map of Indigenous Australia
* AIATSIS guidelines for engaging with Traditional Owners (PDF)
* Australian Curriculum: Aboriginal and Torres Strait Islander Histories and Cultures: Guiding principles for promoting and implementing the Australian Curriculum cross-curriculum priority (ACARA)
* 50 Words Project: Hear 50 words in Australian Indigenous languages
* Explore some history of the knucklebones game through images:
* Knucklebones - Sheep
* Playing Jacks in Government school playground , Melbourne, 1955
* Classroom resources: What is this? Knucklebones
* Knucklebones game instructions
* Where to purchase knucklebones (jacks): Toy world
* Yulunga Traditional Indigenous Games

# Australian Curriculum

## Digital Technologies

Achievement standard

By the end of Year 2, students follow and describe basic algorithms involving a sequence of steps and branching.

### Content descriptions

**Years 1–2**

* Follow and describe algorithms involving a sequence of steps, branching (decisions) and iteration (repetition) (AC9TDI2P02)

## Related content

**Mathematics**

**Year 1**

Creating and following an algorithm consisting of a set of instructions (AC9M1SP02)

## 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)