**Where’s the mankarr? Video observation data: Part 1**

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| Year levelStrand(s)Lesson lengthCD Code | * Year 4, Year 5
* Statistics
* 60 mins
* [AC9M4ST01](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/foundation-year_year-4_year-5/content-description?subject-identifier=MATMATY4&content-description-code=AC9M4ST01&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)
* [AC9M4ST02](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/foundation-year_year-4_year-5/content-description?subject-identifier=MATMATY4&content-description-code=AC9M4ST02&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)
* [AC9M4ST03](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/foundation-year_year-4_year-5/content-description?subject-identifier=MATMATY4&content-description-code=AC9M4ST03&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)
* [AC9M5ST03](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/foundation-year_year-4_year-5/content-description?subject-identifier=MATMATY5&content-description-code=AC9M5ST03&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)
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| Lesson summary | In this first of two lessons, students investigate data from animal observations recorded by a video camera. Students take on the role of ‘researchers’ and use secondary data about an endangered Australian marsupial.In the follow-up lesson *Where’s the mankarr? Recording and visualising data*, students visualise and interpret the data recorded of their animal observations.This lesson was developed in collaboration with Caty Morris and Aboriginal and Torres Strait Islander Mathematics Alliance (ATSIMA).ESA would like to acknowledge the Kanyirninpa Judurrpa and Martu peoples as developers of the source material used in the creation of this lesson. |
| Learning intention | * We are learning how data is used to monitor and care for endangered species using a real-life context from the Western Desert.
* We are also learning language of First Nation’s traditional owners of the land, the Martu.
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| Success criteria | By the end of this lesson, students can: * decide on what data to record and how to record it
* visualise their data using an appropriate format
* explain the purpose of acquiring the data
* learn key terms in Martu, a First Nation Australian language.
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| Why are we learning about this? | Students can engage in a real-life mathematics experience about caring for Country through a First Nations Ranger group. This activity connects mathematics with culture. |
| Prerequisite student knowledge and language | Prior to this lesson, it is assumed that students have knowledge of:* recording data in a table
* tallying observations
* basic use of a spreadsheet.
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| **Resources** | * Lesson plan (Word)
* Teacher’s slides: Where is the mankarr? (PowerPoint)
* Teacher’s slides: Ways to record (PowerPoint)
* Access to the video: [Wanja Mankaar? Where is the bilby](https://www.kj.org.au/media-films/wanyja-mankarr)?
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Curriculum information

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| Achievement standard | By the end of Year 4, Students create many-to-one data displays, assess the suitability of displays for representing data and discuss the shape of distributions and variation in data. They use surveys and digital tools to generate categorical or discrete numerical data in statistical investigations and communicate their findings in context. They convert between units of time when solving problems involving duration. By the end of Year 5, students plan and conduct statistical investigations that collect nominal and ordinal categorical and discrete numerical data using digital tools. |
| Content description(s) | Students acquire data for categorical and discrete numerical variables to address a question of interest or purpose, using digital tools; represent data using many-to-one pictographs, column graphs and other displays or visualisations; interpret and discuss the information that has been created. [AC9M4ST01](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/foundation-year_year-4_year-5/content-description?subject-identifier=MATMATY4&content-description-code=AC9M4ST01&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)Students analyse the effectiveness of different displays or visualisations in illustrating and comparing data distributions, then discuss the shape of distributions and the variation in the data. [AC9M4ST02](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/foundation-year_year-4_year-5/content-description?subject-identifier=MATMATY4&content-description-code=AC9M4ST02&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)Students conduct statistical investigations, collecting data through survey responses and other methods; record and display data using digital tools; interpret the data and communicate the results. [AC9M4ST03](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/foundation-year_year-4_year-5/content-description?subject-identifier=MATMATY4&content-description-code=AC9M4ST03&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)Students plan and conduct statistical investigations by posing questions or identifying a problem and collecting relevant data; choose appropriate displays and interpret the data; communicate findings within the context of the investigation. [AC9M5ST03](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/foundation-year_year-4_year-5/content-description?subject-identifier=MATMATY5&content-description-code=AC9M5ST03&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick) |
| General capabilitiesCross-curriculum priority | General capabilities Numeracy* Interpreting and representing data [Level 4](https://v9.australiancurriculum.edu.au/f-10-curriculum.html/learning-areas/mathematics/year-4/general-capability-snapshot?subject-identifier=MATMATY4&content-description-code=AC9M4ST01&general-capability-code=N&element-code=NS&sub-element-index=0&sub-element-code=NSIRD&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)

Science* Explain the roles and interactions of consumers, producers and decomposers within a habitat and how food chains represent feeding relationships. [AC9S4U01](https://v9.australiancurriculum.edu.au/f-10-curriculum.html/learning-areas/science/year-4/content-description?subject-identifier=SCISCIY4&content-description-code=AC9S4U01&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)

Cross-curriculum priority Aboriginal and Torres Strait Islander Histories and Cultures* 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](https://v9.australiancurriculum.edu.au/f-10-curriculum/cross-curriculum-priorities/aboriginal-and-torres-strait-islander-histories-and-cultures/slideout?code=A_TSICP1&organising-idea=0)
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| Areas of challenge | Some students may:* inaccurately record data of observations and misuse a tally system of recording data
* not use a scale on the axis to display frequencies and have difficulty constructing a scale on the horizontal or vertical axis to effectively represent frequencies or measurements
* not realise that the relative lengths of the bars relate to quantities in the collected data
* not realise that measurement data can be grouped
* be unable to interpret the meaning between marked intervals on scales of frequencies or measures.
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| Strategies | * [Culturally responsive pedagogies](https://www.mathematicshub.edu.au/plan-teach-and-assess/teaching/teaching-strategies/culturally-responsive-pedagogies/)
* [Concrete, Representational, Abstract (CRA)](https://www.mathematicshub.edu.au/plan-teach-and-assess/teaching/teaching-strategies/concrete-representational-abstract-cra/)
* [Explicit teaching](https://www.mathematicshub.edu.au/plan-teach-and-assess/teaching/teaching-strategies/explicit-teaching/)
* [Differentiated teaching](https://www.mathematicshub.edu.au/plan-teach-and-assess/teaching/teaching-strategies/differentiated-teaching/)
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Lesson structure

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| Learning hook1. mins
 | **Download the teacher’s slides: Where is the mankarr? to accompany your teaching. You will find this in the ‘What you need’ section.****Use the ‘Where is the mankarr?’ teacher’s slides to introduce the cultural context for the lesson related to monitoring the bilby (mankarr). Read the blog article** [Traditional Knowledge Helps Monitor Threatened Bilbies on Martu Country](https://blog.nature.org/2017/07/17/traditional-knowledge-helps-monitor-threatened-bilbies-on-martu-country/) **which includes the video** Searching Country for Bilbies **(1:07mins). If time permits view the video** with your students.**Introduction****(Slides 2–5) Introduce the Martu and the bilby. Talk about the importance of data collection.*** **Show an image of a bilby. Use the slides to identify a region in WA in which the Martu are caring for Country.**
* **Clarify what ‘endangered’, ‘threatened’ and ‘extinct’ mean.**
* **Explain that the video can be used to gather data about the life of a bilby (mankarr).**
* **Discuss the type of data they might expect to see in the video.**

**Differentiation** (support): Bilbies are nocturnal. When might we see a bilby?Differentiation (enabling): What data might we observe in the video? How might the date be useful?Differentiation (extending): What might you see in the video? How could you record data about other animals observed?  |
| Explore40 mins | * (Slides 6–8) Introduce relevant terminology in Martu and English. Ask students why the words are being taught.
* Invite students to take on the role of researcher to assist First Nations Ranger groups to care for Country.
* Refer back to Slide 5 and discuss the purpose of collecting the data, why it is important and how it can inform the rangers.
* As a class, watch the video: *Wanja Mankaar? Where is the bilby?* Ask the students:
* What would help you record the data accurately? (Expect answers such as a table with animal and day observed.)
* Over what time period is the data? We call this the data range – ‘Day 1 to Day 199’ (last sighting of an animal). How many months is that? How can we work that out?
* What happened on Day 219, 9 August (tulparra) 2012? (Answer: filming equipment was packed up.)

**Explicit teaching** Download the teacher’s slides: Ways to record. Discuss the data that students can collect from viewing the video. * Use teacher’s slides: Ways to record to discuss various ways to record the data in a table or other suitable format. Discuss the limitations and advantages of each.
* Have students decide on what data they are going to collect (carried out in next session) and how it will be recorded.

Differentiation: (support): Record your observations of one type of animal. What do you notice?Differentiation (enabling): How many animals did you observe? At what time of the year were they observed?Differentiation(extending): There are many days that no sightings of any animal were made. How can we show that? Why might that information be important? |
| Summary and reflection10 mins | * In groups, reflect on the video and brainstorm potential challenges students might have collecting and recording the data. What approaches are they considering ensuring that they accurately and efficiently collect the data? Share as a class.
* Form pairs or groups of three and work out how the data will be collected and who is responsible for which part (drawing, collecting, recording). Have them list the steps or approaches they will put in place to ensure accuracy.
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| Assessment | * Use observation and informal conversations to gauge students’ understanding of ways to acquire and record data.
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