

Nganamarra (Malleefowl)

A case study in Two-way Science integrated inquiry learning for remote Aboriginal schools and communities



Wiluna Remote Community School



Wiluna is situated in the mid-west region of Western Australia on the edge of the Western Desert.

Wiluna Remote Community School has a population of between 70 and 105 students. Most students are Wiluna Martu. The Indigenous language of the area is Martu Wangka however most Martu at Wiluna speak Aboriginal English. Wiluna School also has students of Fijian and Tongan ethnic origins.

The Science Pathways for Indigenous Communities program has been working with Wiluna School from 2016 –2018 to develop an integrated Two-way Science learning program and build connections between the school and community. The Science Pathways for Indigenous Communities program is part of the Indigenous STEM Education Project, managed by CSIRO and funded by BHP Foundation.

Two-way Science teaching and learning cycle

Indigenous Ecological knowledge

Planning: Aboriginal people

Complete the Bush Planner.
What is in season now?
What is happening in the bush this term?
What do you want students to learn about?
Where can we take the students?
Who is the best person to teach?
When can we go out on country?

Plan and connect to curriculum

Planning: Teachers

Select a Science Pathways Two-way Science topic, unit and activity
Connect to other integrated curriculum outcomes .
What will students do before and after Learning on Country?
What science activities can happen on country?
Will Indigenous rangers or land management groups be involved?
How will you assess the learning?

Learning in class (preparation)

Learning in class (preparation)

Aboriginal expert talks to students
Focus the Learning on Country.
Connect to prior knowledge
Encourage students to **question** and **predict**
Introduce Aboriginal Language and science words.
Prepare equipment and go through data collection sheets

Learning on Country

Learning on Country

Aboriginal experts lead the learning
Record using photos and video
Ask questions
Encourage the use of Aboriginal Language and note key words
Write down key language words
Bring knowledge and materials back to class for follow up

Learning in class (follow up)

Learning in class (follow-up)

Recount using photos and video
Add to the Two-way Science journal
Add Language and English science terms to word wall
Science investigation
Aboriginal experts follow up in class
Backwards plan- what else did students learn?
Integrate with other learning areas
EALD, Literacy, Numeracy, HASS, Art..
Assessment

Reflect and share the learning

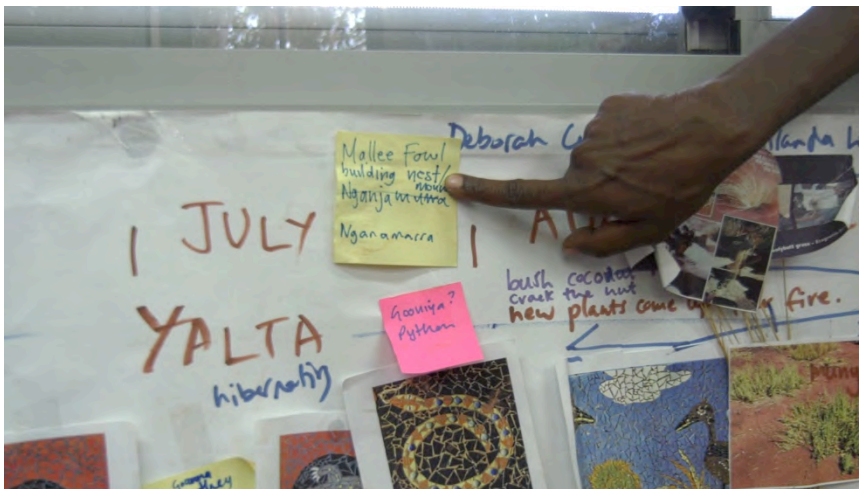
Reflect and share

Build the Two-way Science program in small steps.
Reflect together on what worked well and what can be improved next time.
Share and celebrate success with the community.
Invite families and elders back to see the work the class has produced.

Planning a Two-way Science program

Lauren teaches year 2/3/4 at Wiluna Remote Community School.

Anthea is a Martu teacher in her class.



Lauren and Anthea talked about what was happening on Country in Yalta Puru (cold time). Anthea told Lauren that her mother, elder Rita Cutter, wanted to show students a Nganamarra (Malleefowl) nest.

Planning a Two-way Science program

Lauren and Rita met in the staffroom. Rita told Lauren that Nganamarra are rare these days. Rita wanted to show students where Nganamarra live, how they build their special mound nests and how to tell the difference between the tracks of Nganamarra, kalaya (emu) and patarta (bush turkey).



Lauren and Rita planned a trip to Country to visit the Nganamarra nest.

Planning a Two-way Science program

Lauren did some research into the Malleefowl. She looked at the Science Pathways Two-way Science education resources and connected the Nganamarra field trip to a two-way investigation into habitat.

A Two-way Science learning program connects Aboriginal knowledge to the Australian Curriculum.

Connections to the Science Curriculum (Biological Sciences) :

Year 2: *Living things grow, change and have offspring similar to themselves.*
ACSSU030

Year 3: *Living things can be grouped on the basis of observable features and distinguished from non-living things.*
ACSSU044

Year 4: *Living things have life cycles.*
ACSSU072

Year 4: *Living things depend on each other and the environment to survive.* ACSSU073



Learning in class (preparation)

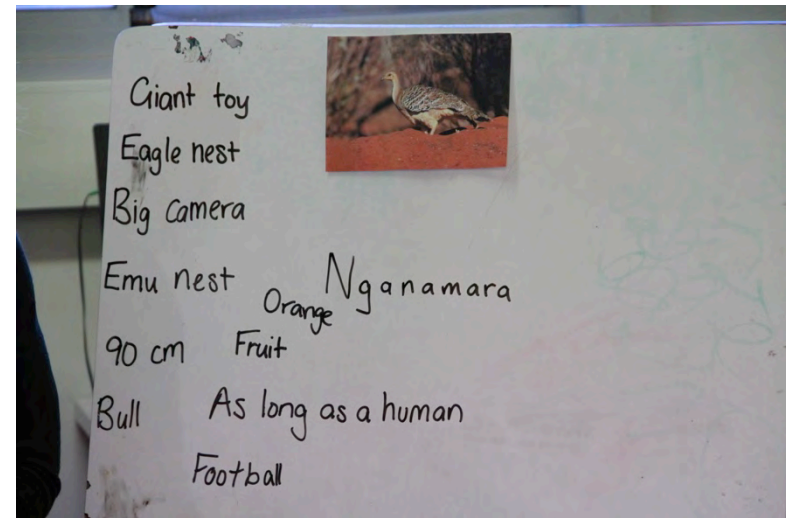


Lauren asked students what they knew about the Nganamarra.

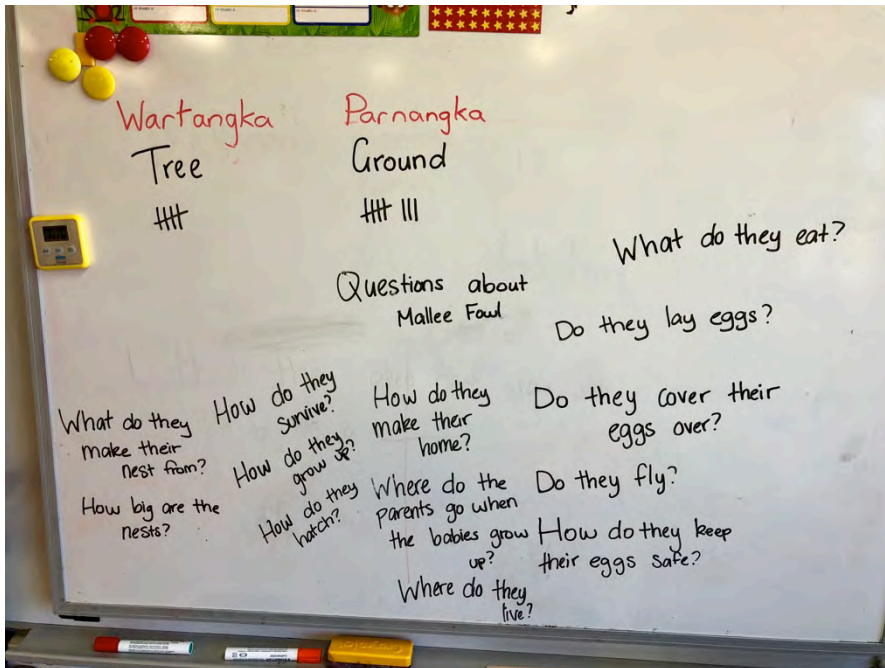
“Where does the Nganamarra build its nest?”

“How big is the Nganamarra’s nest?”

A Nganamarra nest is as big as a...



Learning in class (preparation)



Lauren's class had done lots of work last term learning how to ask questions.

They wrote questions and predictions in Standard Australian English.

Asking questions and making predictions are science inquiry skills in the Australian curriculum.

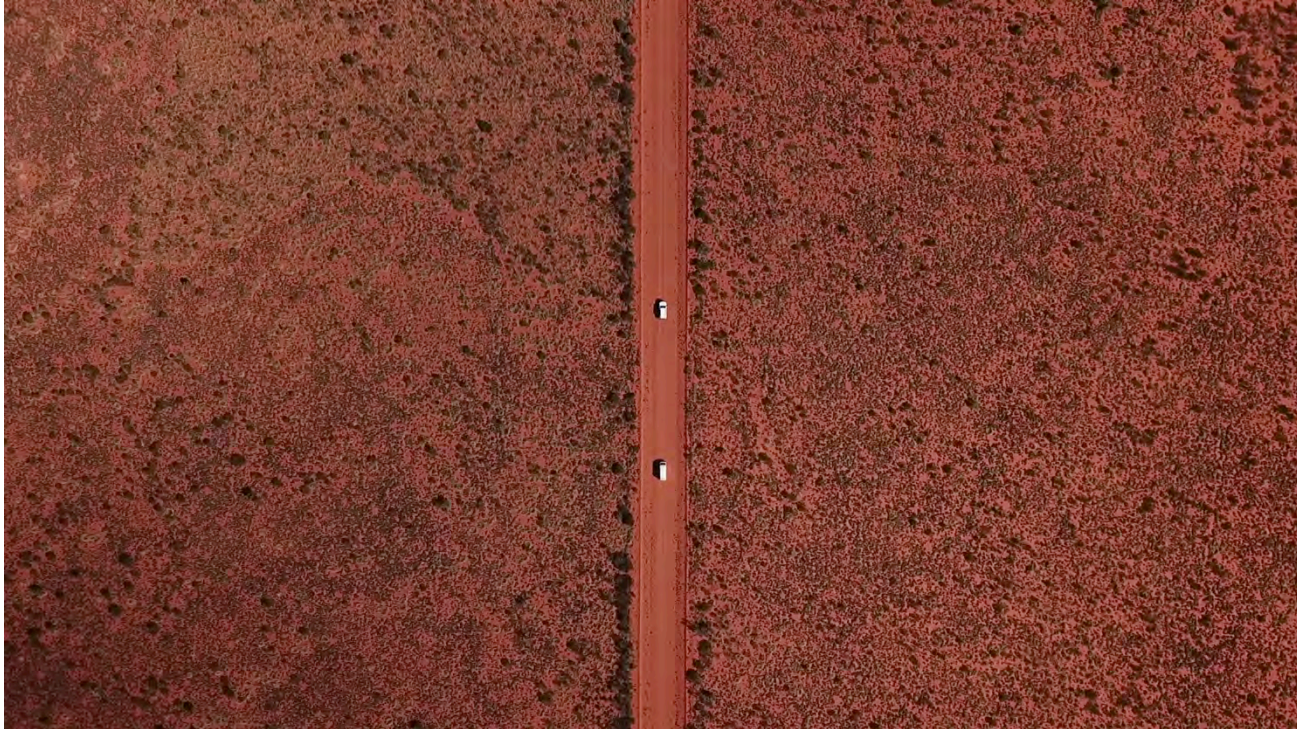
AC SIS053, AC SIS064

Learning in class (preparation)



Students watched a video about Nganamarra.

Learning on Country



Lauren, Anthea, Rita and Mr T drove with Lauren's class to the site of the Nganamarra nest. Dave from Science Pathways and film makers Fiona and Nixon came too.

Learning on Country



When they arrived, Rita led the learning.

“This way!”



Learning on Country



Rita showed everyone fresh Nganamarra tracks.

She also found cat tracks.

Rita explained that cats ate Nganamarra.

She was worried.



Learning on Country

Rita showed students the difference between a Nganamarra track...



...and a patarta (turkey) track.

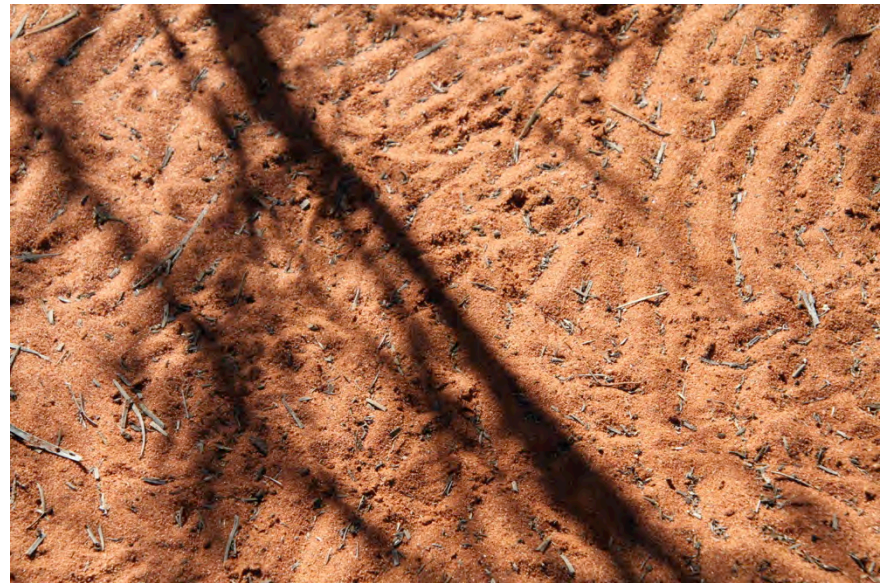
Biological Sciences Year 3: Living things can be grouped on the basis of observable features and distinguished from non-living things. ACSSU044

Learning on Country field trip



Rita led the class towards the nest.

As they got closer Rita pointed out the raking of the Nganamarra.



Learning on Country



They found the nest.

Rita told everyone not to stand on the nest.



Learning on Country



Rita explained that the Nganamarra made a nesting mound in unburnt tjul tjul (thicket) country where there was lots of leaf litter.

She said that the male Nganamarra built up the sides of the nest with sand then scraped leaf litter into the middle. She said that this litter was put there to keep the eggs warm.



Learning on Country



Rita explained that the Nganamarra covers the mound with sand. The male Nganamarra looks after the nest by moving sand on and off the litter to keep the same temperature inside. She said that the chicks scratch their way out of the nest feet first, and that the mother and father birds leave the chicks to look after themselves. Students asked Rita some of the questions that they had written in class.

Biological Sciences Year 2: Living things grow, change and have offspring similar to themselves. ACSSU030

Biological Sciences Year 4: Living things have life cycles. ACSSU044

Learning on Country



The students wanted to measure the mound but they had no tape measure! They decided to hold hands around the nest and then measure the circle when they got back to class. They counted 9 children and 2 adults around the nest. Nganamarra numeracy!

Learning on Country

Lauren had planned some activities for the students back in class.

Lauren asked students to pretend they were a Nganamarra.

“What do you need to make your nest?”



Learning on Country

First, Rita showed students the main plants in this Nganamarra tjul tjul country. Rita identified Karriya (acacia), Wama (hakea), Putart, Tjanpi (spinifiex) and Milyiri (eucalypt).

Anthea helped Lauren write down the Martu Wangka (Language) names to use back in class.



Learning on Country

Then students collected the litter from under each tree to make a nest. They put the litter in a bucket.

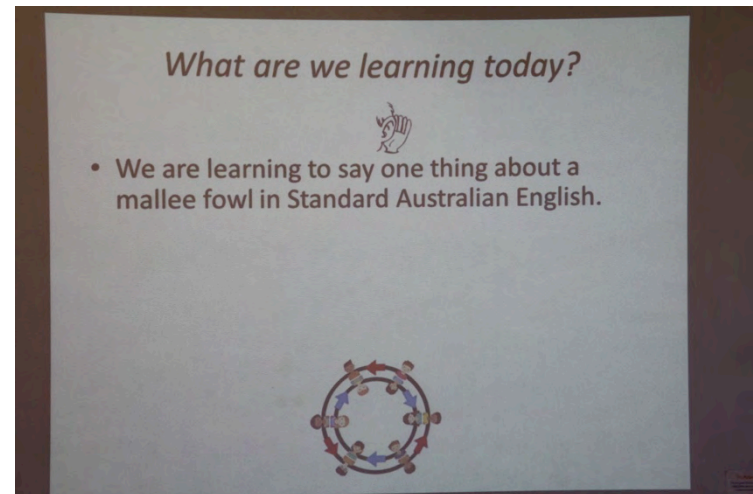
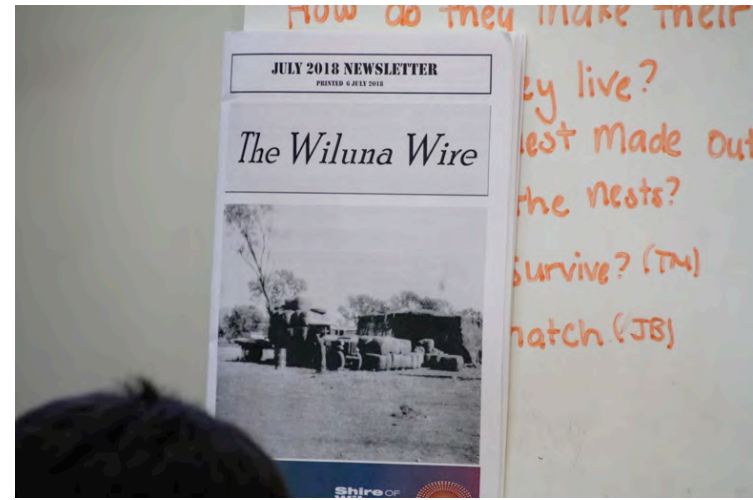
They found a Weevil in the litter.



Learning in class (follow up)

Back in class the next day, Mr T asked students to write a report for the Wiluna Wire community newsletter. Mr T used Inside/Outside Circle, a co-operative learning strategy, to practise EAL/D speaking skills.

Students had to say and practice one Malleefowl fact in Standard Australian English.



Learning in class (follow up)



They measured the circle of people using a measuring tape and found out that the nest was 4 metres across.

Learning in class (follow up)



Students emptied the litter onto a big tarpaulin. They sorted through the litter looking for evidence of the Nganamarra diet.

They picked out things that the Nganamarra might eat and put this in a specimen jar.



Learning in class (follow up)



They found evidence of seeds, seed pods and insects in the litter.

They identified leaves from each type of tree.

Rita taught the names of the trees in Martu Wangka.

Biological Sciences Year 4: Living things depend on each other and the environment to survive. ACSSU073



Learning in class (follow up)



Students sorted and classified their evidence into seeds and insects.

Sorting and classifying are numeracy and science inquiry skills used in analysing data. ACSIS057, ACSIS065

Learning in class (follow up)

They looked at the remains of insects from the litter under the digital microscope.



Learning in class (follow up)

Students demonstrated their learning by making a Nganamarra nest just the way Rita told them.



Learning in class (follow up)



Lauren observed the students building the nest and asked them questions to assess their learning.

Learning in class (follow up)



Students shared their learning with the rest of the school and community by building a Nganamarra nest in the school yard, and writing a report for the Wiluna Wire.

Science Communication is an important science inquiry skill in the Australian Curriculum.

Year 3-4 Represent and communicate observations, ideas and findings using formal and informal representations ACSIS060, ACSIS071





NGANAMARRA

Two-way Science Integrated Learning Program



About Science Pathways for Indigenous Communities

Science Pathways for Indigenous Communities is part of the CSIRO Indigenous STEM Education project delivered by CSIRO and funded by the BHP Foundation. The Science Pathways program delivers on-site adult learning programs to school staff and community to work together in the planning and implementation of Two-way Science integrated learning programs. Two-way Science builds on the strengths of Indigenous ecological knowledge and the educational opportunities provided by the rich cultural and environmental landscape of remote Aboriginal communities.