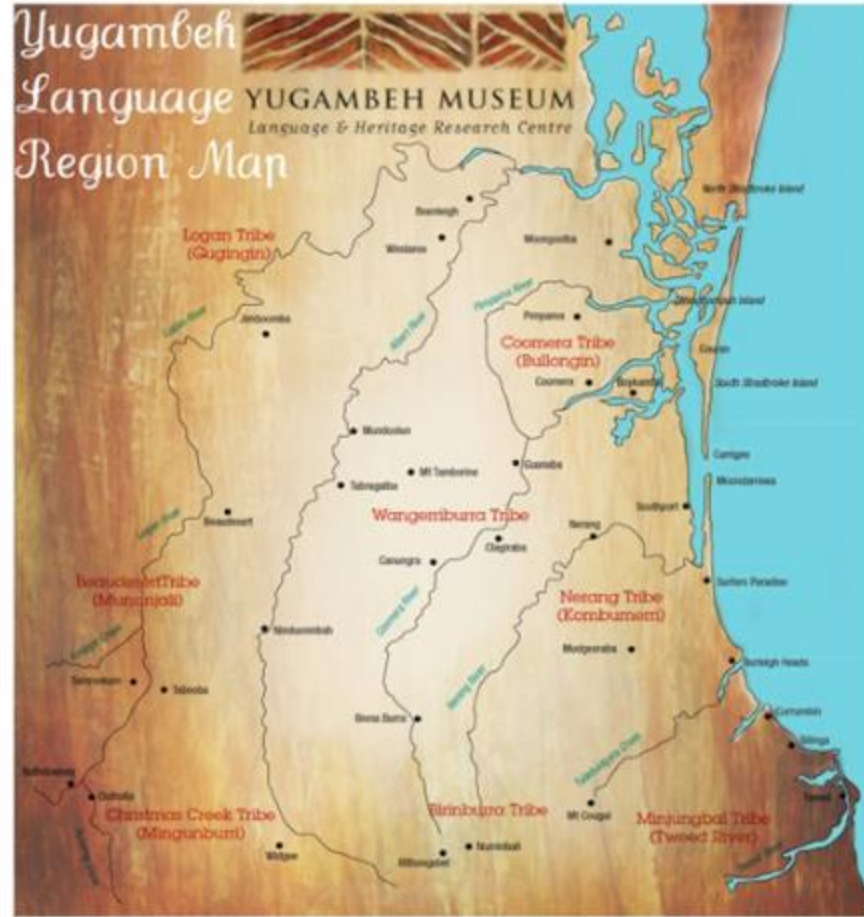




Analysing indigenous seasons

to hypothesise about indigenous epistemology and ontology



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Learning objectives

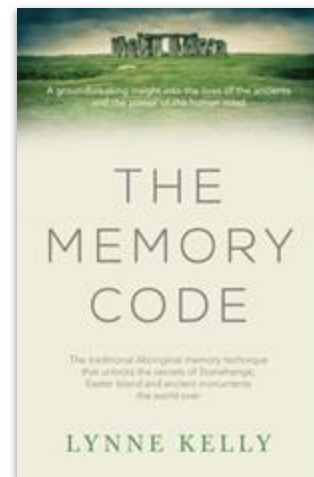
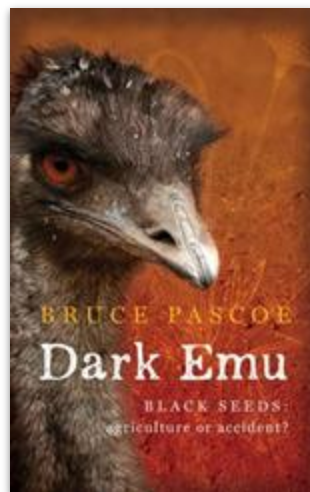
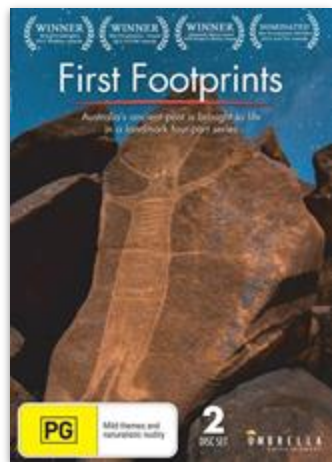
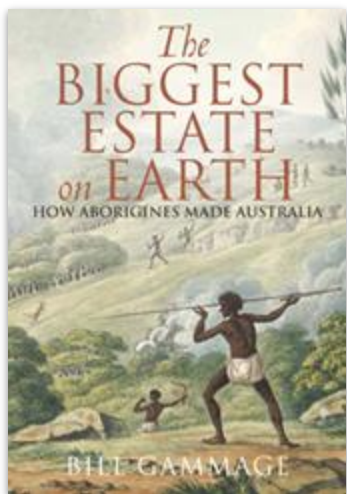
We are learning to:

Describe the indigenous conception of seasons

Compare and contrast between Western (European) and Indigenous conceptions of seasons

Hypothesise about indigenous knowledge systems (epistemology) and world view (ontology)

Suggested holiday reading



[Watch First Footprints through the library](#)

The Australian Curriculum: Cross curriculum priorities

“The Australian Curriculum is designed to meet the needs of students by **delivering a relevant, contemporary and engaging curriculum** that builds on the educational goals of the Melbourne Declaration. The Melbourne Declaration identified three key areas that need to be addressed for the **benefit of individuals and Australia as a whole**. In the Australian Curriculum, these have become priorities that give students the **tools and language to engage with and better understand their world at a range of levels**. The priorities provide national, regional and global dimensions which will **enrich the curriculum through development of considered and focused content that fits naturally within learning areas**. They enable the delivery of learning area content at the same time as developing knowledge, understanding and skills relating to [Aboriginal and Torres Strait Islander Histories and Cultures](#), Asia and Australia’s Engagement with Asia and/or Sustainability. Incorporation of the priorities will encourage conversations between students, teachers and the wider community.”



Conceptual Framework for the Aboriginal and Torres Strait Islander Histories and Cultures

Indigenous perspectives elaborations

STRAND – SUB-STRAND	CONTENT DESCRIPTION	CROSS-CURRICULUM PRIORITY ELABORATION (New ELABORATIONS IN BLUE)
		knowledge, such as predictions regarding the impact of invasive species
Year 7		
35	SU Biological sciences Classification helps organise the diverse group of organisms (ACSSU111)	• Investigating classification systems used by Aboriginal and Torres Strait Islander peoples and how they differ with respect to approach and purpose from those used by contemporary science
36	SU Biological sciences Interactions between organisms, including the effects of human activities can be represented by food chains and food webs (ACSSU112)	• Investigating Aboriginal and Torres Strait Islander peoples' responses to the disruptive interactions of invasive species and their effect on important food webs that many communities are a part of, and depend on, for produce and medicine
37	SU Chemical sciences Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques (ACSSU113)	• Investigating separation techniques used by Aboriginal and Torres Strait Islander peoples, such as hand picking, sieving, winnowing, yandying, filtering, cold pressing and steam distilling
38	SU Earth and space sciences Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the sun, Earth and the moon (ACSSU115)	• Researching Aboriginal and Torres Strait Islander peoples' oral traditions and cultural recordings of solar and lunar eclipses and investigating similarities and differences with contemporary understandings of such phenomena
39	SU Earth and space sciences Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the sun, Earth and the moon (ACSSU115)	• Researching knowledges held by Aboriginal and Torres Strait Islander peoples regarding the phases of the moon and the connection between the lunar cycle and ocean tides
40	SU Earth and space sciences Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the sun, Earth and the moon (ACSSU115)	• Investigating Aboriginal and Torres Strait Islander peoples' calendars and how they are used to predict seasonal changes
41	SU Earth and space sciences Some of Earth's resources are renewable, including water that cycles through the environment, but others are non-renewable (ACSSU116)	• Exploring Aboriginal and Torres Strait Islander peoples' connections with, and valuing of, water and water resource management
42	SU Physical sciences Change to an object's motion is caused by unbalanced forces, including Earth's gravitational attraction, acting on the object (ACSSU117)	• Investigating the effect of forces through the application of simple machines, such as the bow and arrows used by Torres Strait Islander peoples or the spear throwers used by Aboriginal peoples
63	SHE Nature and development of science Scientific knowledge has changed peoples' understanding of the world and is refined as new evidence becomes available (ACSHE119)	• Investigating the contributions of Aboriginal and Torres Strait Islander peoples' knowledge in the identification of medicinal and endemic plants
64	SHE Use and influence of science Solutions to contemporary issues that are found using science and technology, may impact on other areas of	• Researching the development of commercial products that are founded upon the traditional knowledge and practices of Aboriginal and Torres

In 2018, elaborations from a First Nations perspective were written for the ACS

[Download a copy here](#)

Compare and contrast Western and Indigenous conceptions of seasons



Vivaldi's four seasons

Springtime is upon us.
The birds celebrate her return
with festive song,
and murmuring streams are
softly caressed by the breezes.
Thunderstorms, those heralds
of Spring, roar, casting their
dark mantle over heaven,
Then they die away to silence,
and the birds take up their
charming songs once more.

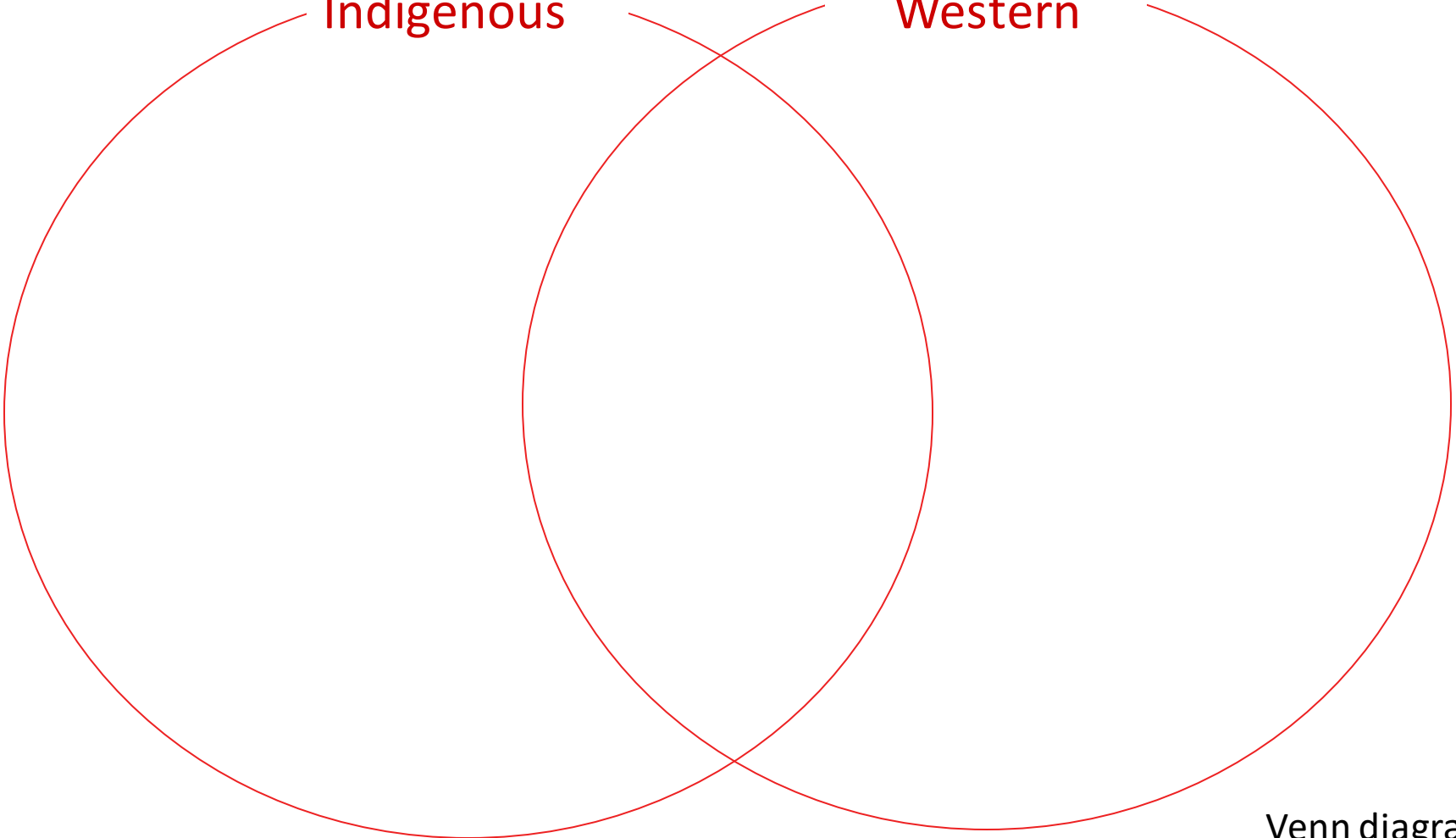


Group

Indigenous

Western

Seasons



Venn diagram

Actually a map of indigenous estates



The Dreaming and The Law

- governed all behaviours
- The store of all knowledge
- Stored in the Arts (stories, pictures, ceremony, song)
- United all people

- Indigenous Australians occupied all ecosystems by 35,000 BCE

- established nationwide:
 - knowledge and laws
 - trade routes of ideas, technology, kin

The Law demanded everyone Care for Country.
This involved:

- Firing (templates, highways)
- Performing ceremony
- Maintaining kinship

Tindale 1974 map of indigenous languages

First nations from ca. 10,000 ya, after the great floods.

Tasmania became separated from the mainland, the Carpentaria islands, the Torres Strait, the Great Australian Bight, Sydney Harbour and the Queensland coastal islands were all created.

All this was permanently stored in the Dreaming stories.

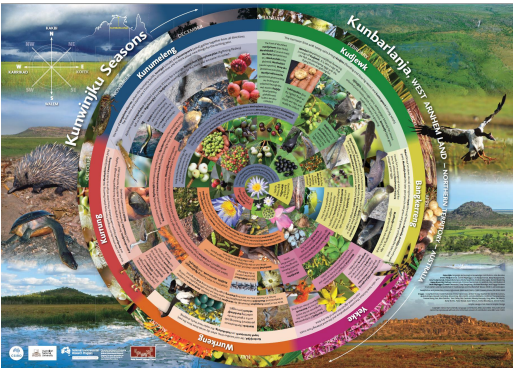


The activity

- Junior Secondary science course
- Undergrads (B Ed) and Post Graduates (M Sec Teach)
- Surface level analysis – compare and contrast Western and Indigenous seasons
- Multi-level analysis
- Collaborative learning strategy – Jigsaw
- Synchronous, cloud-based tools
- OneNote, Teams



Kunbarlanja (West Arnhem land, WA)



Tiwi Islands (Northern Territory)



Walmajarri (Fitzroy Valley, WA)



Gooniyandi (Margaret river, WA)



What do you see? Why do you think it's there/that way?

Wurrkeng
 In weather time, when dry winds blow from the east, and **kaboklung** the water level starts drooping. **hoo-dam-on** (heron) tells time for **du-kadji** (eggs).

August
 e **Mandjalen** (*Eucalyptus minor*), **Mamboorajarri** (*Eucalyptus affinis*) the native bees are busy collecting pollen and making **Mankung** (sugar bag) and hunting **Kuyi** (mangaroo).

September
Kurrung
 The hot, dry time where the air is fragrant from many plants flowering, like **Manboybei** and **Mandjarduk** (*Syzygium suborbicular*). These plants will go on to fruit in **Kaborakardjme**, the water is drying out and it has dropped low enough to collect **Kamubirr** (freshwater mussels), water lily roots and catch **Wakih** (freshwater prawns).

October
 Good hunting time for many birds like **Manlamak** (magpie goose), **Djilakuybi** and plumed whistling ducks, **Mankal** (pacific black duck) and **Banuk** (Australian bustard).

Very good time for hunting **Ngalmanyi (northern long-necked tortoise) with **kawurluwurhime** (water python) and **Borloko** (water python) when the water level is low. **Mankok** (edible tubers that are boiled or cooked) are aquatic plants with edible tubers that are boiled or cooked.**

Long-necked tortoise (Ngalmanyi**) out of their floodplain with **Borloko** (water python).**

Throughout the dry season, **Mandem (roots) and **bandjungka** (seed pods) can be eaten raw as snacks. **Man-dem** (roots) and **bandjungka** (seed pods) are also collected to eat. The seeds can be collected to eat. **Man-dem** (roots) and **bandjungka** (seed pods) are also collected to eat.**

National Environmental Research Program
 This project is part of the **Wurrkeng** National Environmental Research Program, the first Indigenous-led National Environmental Research Program.

What do you see? Why do you think it's there/that way?

JAMUTAKARI

The wet season

FEBRUARY

During Jamutakari rain, Pakitiringa, falls every day and the swamps, creeks and rivers are full. Wunijaka, the north-west wind blows and brings rain. There is much lightning, Pumurali, and thunder with the rain.

Mapikari Season
Many possum tracks
When the first rains fall the possums return to their trees foraging on the ground at night and leave tell-tale muddy footprints on the trunk of the tree. This makes possum hunting easier.

Japarrika (Greater and Lesser Frigatebirds) near the shore or roosting in the mangroves tell us that a storm or cyclone is coming.

Alarplingwani (Common Koel) calls the wet season will begin soon.

Marakati (Spear seed heads)
Kuruma (crabs)
shell

MARCH

Tawutawungari

Season of the clap sticks

Kurlama ceremonies are held now. These ceremonies centre around Kurlama (Doo-roo-roon in the language that is prepared, baked and eaten only at this time. Jankmakki (Brahminy Kite) is imitated by the Kurlama ceremony, with dancers painting themselves white and ochre with feathers for

Towards the end of the

INDS – NORTHERN TERRITORY

Student work



What do we see?

Three apparent 'times' as opposed to four seasons

Instructions for when is the best time to access animal and plants based upon 3 'times' e.g. prescriptive "first fish for bait, then meat on hook will attract kalparrku..." Very seasonal

Notations regarding animal location based upon 'times', freshwater warrampu during floodwater time

Only one animal (grub) is available all year

Holistic and sustainable life/food/medicine cycle

Superstition – catching warrara or jankurr at the wrong time of the year

Wheel is colour coded by time and then animal and plants

Why?

Directly related to temperature and rain

Plant and animal availability impacts upon food sources and medicinal resources. Offers opportunity to substitute for other options

Possibly for safety reasons e.g. floodwater time is when you see freshwater crocodiles floating on surface of water

The grub is a food source that can be accessed at any time of year

Provides year-round access to necessary food and medicinal sources.

Possibly catching during that time may be detrimental to either the animal or the person consuming it. Superstition creates resilient and dominant behaviours

Makes it much easier to read

Student work



What do we see?	Why?
The totem poles	Represents the protector of the community / they protect the totem
3 seasons (stella)	One wet season one hot season full of humidity and one dry season
Location (Craig)	The seasons are named after and located in the Tiwi island in the NT
Circular shape (Craig)	Represents the circular nature of the seasons
Different bird species (Craig)	The movements and activities of the birds coincide with the changing of the seasons
Various plants and fruit (stella)	the seasons correlate with various plants and fruit which grow during the changing seasons
Thunder season	Indicating the move from the hot and humid season to the wet season
Bushfire season (Craig)	Typically dry grasslands leading to the season of fire and smoke
Kurawi season of fog (Stella)	Temperatures are low and fog develop in the morning
Mumpikari: Possum hunting season! (Jade)	Possums return to trees and leave muddy footprints on trunks, makes for easy tracking for food.
Jamutakari Season: Frigatebirds warn of impending cyclones (Jade)	They stay near the shore or in the mangroves for safety, warns indigenous that it's time to prepare for the storm

Tiwi

Student work

What conclusions can you make about indigenous knowledge of Country?

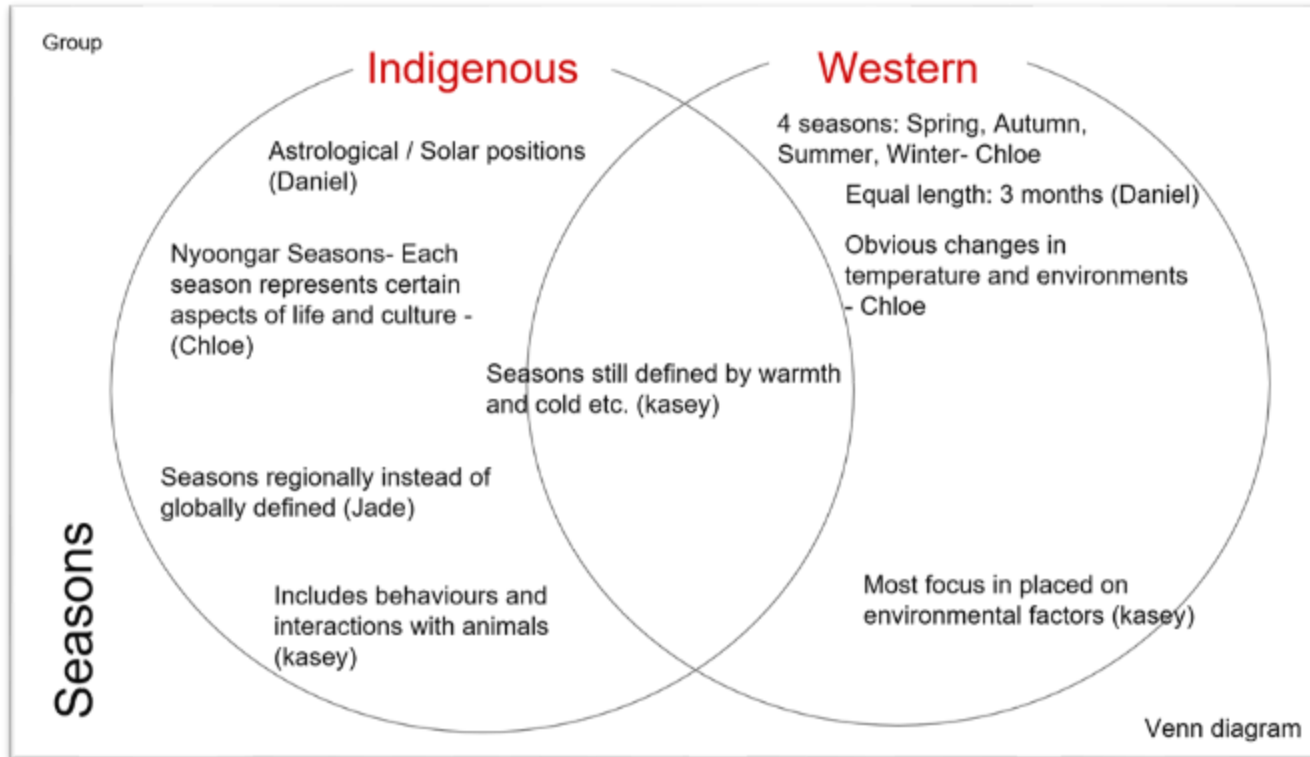
- Everything is interrelated, for example, animal and plant behaviour is connected to the weather.
- Indigenous peoples also discovered a lot of their knowledge of the country by stars and star constellations – patterns would often lead to specific places in the country.
- Indigenous people learnt when and where the best places were to hunt at certain times in the year based on fish migration.



Student work

What do we see? (Gooniyandi)	Why?
Circular	It is a cycle
Reptiles are visibly larger	Preparing for hibernation, thus winter. (Todd)
Utilising plants and fruits to overcome ailments	For medicinal practices. (Todd)
Use of colours alongside seasons	Red seeds indicate rain coming soon. Also, colouring on the worksheets ties in with seasons red (hot), dark blue/grey (wet). (Todd)
Three Seasons	Three major climate changes (wet, cold, hot) (Daniel)
Seasons break up jobs	Harvests and animal behaviour changes throughout the year (Daniel)
Colour blue	Indicates the 'cold male weather time' (kasey)
Fishing after rain	More water running. (Todd)
Crows start to call	Moving into the season (Kasey)
Weather events come from 4 cardinal directions associated with 4 snakes	Meteorological events come from predictable directions (Daniel)
Sawfish	Good meat for children, medicinal for aches and pains (kasey)
Mob of flies around you	Means the conkerberry's are ripe to eat (kasey)
Land management strategies change throughout the year	Demands from animals and plants change as do the materials to meet them (Daniel)
Cold season is gendered (Craig)	Starts off female (cold days and nights) before transferring to male (mild)
Compass directions (Chloe)	Instead of North, south etc its Jangala etc

Student work



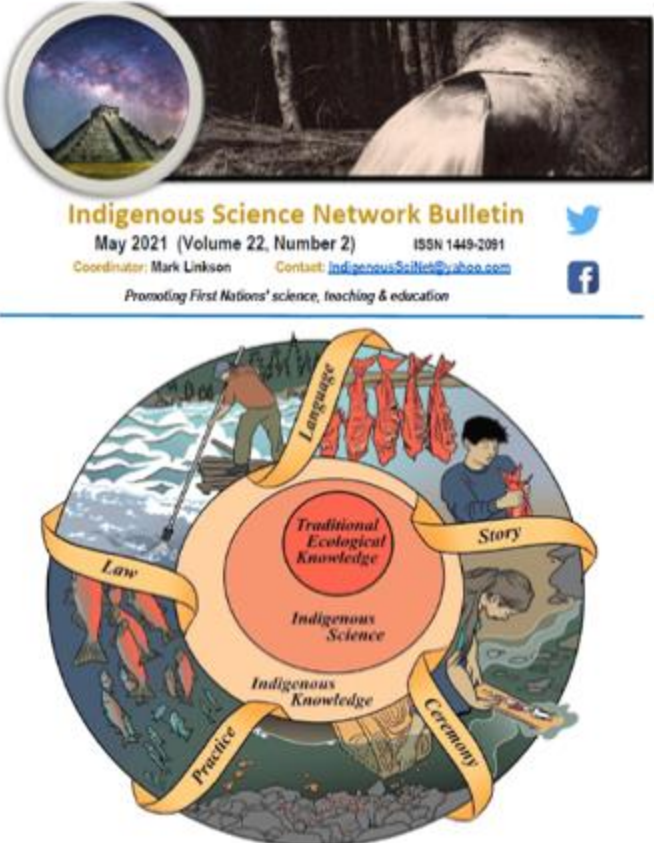
Student work

What can you conclude about indigenous knowledge systems (epistemology)- How indigenous people see things, and world view (ontology)?- Extend upon knowledge of country points. ✓

- Knowledge through seasons, and how each season influences the world around them regarding fertility and food.
- Their survival surrounded understanding of the land, and how the land around them influences fruitful seasons such as hunting and births.
- Geographical seasons and their conceptions altered based upon their geographical location due to the bases for their seasons relying heavily upon the land and how it responds to this.
- Epistemology- the seasonal changes are complex and heavily inter-related (Harry) and heavily nature-based (Paul).
- Ontology: Surrounds spirituality (The Dreaming). Understanding that the land does not belong to them, they are Stewards of the land and are care-keepers for the land's health (watchers)- (Harry).
- Ontology: The Cyclical nature of time- In Western seasons, we view seasons as linear (The forward motion of time and progress of society)- (Harry).

Where to from here?

- We've only just begun...
- MUST engage with local elders
- Use hypotheses as talking points when yarning with elders



Indigenous Science Network Bulletin
May 2021 (Volume 22, Number 2) ISSN 1449-2091
Coordinator: Mark Linkson Contact: indigenousSciNet@jaboo.com
Promoting First Nations' science, teaching & education

This beautiful image explores the relationships between Indigenous science and the overall Indigenous worldview. Although created with the assistance of First Nations peoples from Canada, it is easy to see how closely the image aligns with other First Nations' lives. This image was shared 157 times from our Facebook page and reached over 23 500 people, which are exceptional numbers and shows how deeply the image resonated with viewers. The image is taken from a book to be released early in 2022. Illustration by [@niroleMconis](#). For more information see author Andrea Reid's post on [Twitter](#).



Learning objectives

We are learning to:

Describe the indigenous conception of seasons

Compare and contrast between Western (European) and Indigenous conceptions of seasons

Hypothesise about indigenous knowledge systems (epistemology) and world view (ontology)