

Understanding the Land through the Eyes of the Ngunnawal People

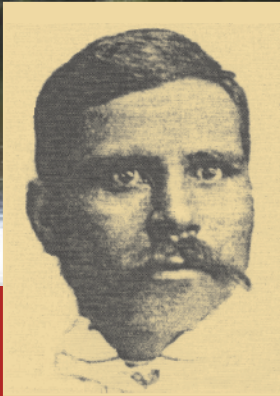
A Natural Resource Management Program for ACT Schools



ACT NATURAL RESOURCE MANAGEMENT COUNCIL



Australian Government



the land

We have walked on the land for thousands of years

We are caretakers of the land not owners of the land.

We are one with the land.

We hunt on the land, the land feeds us.

We make all uses of the land.

We have cultural ceremony on the land.

*We have all-embracing knowledge of how the land changes
and how to adapt to that change.*

We know how to read the land.

We communicate with each other concerning the land.

The land is part of our dreaming.

This poem describes Aboriginal spiritual connection to the land.

The Aboriginal Natural Resource Management curriculum program will be an informative learning tool for students and teachers to gain a greater understanding of Aboriginal Culture. We need to pass down our knowledge to children because it's here we believe reconciliation begins working.

acknowledgements

This resource has been developed by ACT NRM Council, ACT Department of the Environment, Climate Change, Energy and Water, ACT Sustainable Schools Initiative in collaboration with the ACT Department of Education and Training.

We would like to thank the following organisations for their support and input:

United Ngunnawal Elders Council

ACT NRM Council

ACT Department of the Environment, Climate Change, Energy and Water

ACT Sustainable Schools Initiative

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ACT Department of Territory and Municipal Services

ACT Department of Education and Training

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I am proud to be able to launch the Aboriginal Natural Resource Management Curriculum Program.

Through the successive generations who have cared for our lands, Aboriginal communities possess an immense amount of knowledge in natural resource management.

This Curriculum Program will allow that knowledge to be shared among future generations and ensure our lands are given the best protection we can provide.

*Simon Corbell MLA
Minister for the Environment,
Climate Change and Water*



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essential teacher understandings

This information will assist teachers in understanding some of the most significant beliefs and cultural practices of the Ngunnawal people. These understandings are required to successfully deliver the:

Understanding the Land through the Eyes of the Ngunnawal People *A Natural Resource Management Program for ACT schools.*

The Essential Teacher Understandings have been ratified by the Ngunnawal Elders Council. Teachers are strongly encouraged to undertake further research in this important area.





The Ngunnawal People

It is believed that the Ngunnawal people are the original inhabitants of the region known as Ngunnawal country and that they have lived here for more than 21 000 years. This is arguably one of the longest periods of continual habitation anywhere

on earth. The Ngunnawal people have developed a way of living and managing the natural resources of the land which has enabled this phenomenon.

The Ngunnawal people are identified on Tindale's map of Aboriginal Tribes of Australia (1974). This widely recognised and authoritative languages map is a representation of the language groups, or tribes, who inhabited Australia at the time of the new settlement in 1788.

Clans

Within the Ngunnawal tribe there are known to be seven clans who lived in fairly specific localities. There is an obvious link between clan names and the modern names of the areas today. The Maloongoola lived in the Molongolo area, the Bialigee, in the area of Pialligo, the Namitch or Namwitch lived in the area we know as Namadgi, the Cumbeyan lived in the Queanbeyan area, the Kanberri lived in the Belconnen area, the Toogoranoongh lived in Tuggeranong and the Woolobaloh lived in the Yass area.

Neighbouring language groups

The Wiradjuri, Walgalu, Ngario, Yuin, Jaitmatang and Gundungurra joined the Ngunnawal people on the annual trek to the area of Tidbinbilla. These tribes came together and socialised, arranged marriages, traded, made laws and conducted ceremonies. Trade, ceremonies and law making took place at these times. Social and cultural practices are an integral part of the spiritual practices and beliefs of the Aboriginal people.

Ngunnawal country

In 1913, the Australian Capital Territory was proclaimed as a separate entity from New South Wales and pronounced the capital territory of Australia. This territory largely fell within Ngunnawal country. Ngunnawal country was defined by the language of the people inhabiting the land, not by lines clearly marked on a map. The borders of Ngunnawal country are generally believed to have covered the area from Yass to Boorowa, through to Tumut, the highlands west of the Shoalhaven and back to Goulburn. This is an area of almost 11 000 square kilometres.

Canberra meeting place

The areas we now know as Yarramundi Reach, Black Mountain and Pialligo, are believed to have been important meeting places for the tribes coming together on the trek to the mountains. The word Canberra comes from the word Kanberri, meaning meeting place. It is interesting that the national parliament House of Australia is in the same vicinity as traditional meeting places.

Bogong moths and much, much more

Every year bogong moths from the northern areas on New South Wales and southern Queensland migrate south to aestivate in crevices in the rocky ledges and caves of the Tidbinbilla Ranges and Southern Alps. The moths are very nutritious and a good source of protein. This migration of the moths coincided with the timing of the annual trek of the Ngunnawal people and the neighbouring tribes to the same area. The moths were a significant addition to the diet of the gathered tribes.

Misunderstandings have arisen about the coincidence of these events. Many historical accounts of the annual trek across Ngunnawal country overlooked the spiritual and ceremonial importance of the gathering of the tribes and focussed on the practices of feasting on the moths. It is probable that this misrepresentation has played a part in the loss of knowledge of important spiritual and cultural practices.

Acknowledgement of country

As people from other tribes travelled into the territory of the Ngunnawal people, they offered gifts as a symbol of respect and acknowledgement of the territory and tribe they were visiting. In return, they were greeted and invited to leave their footprint on the country of the Ngunnawal. This practice of acknowledging country is reflected at the beginning of formal occasions and ceremonies today in the formal Acknowledgement of Country.

Land ownership

Ownership of land is a relatively new concept for the Ngunnawal people, as for all Aboriginal and Torres Strait Islander peoples. It was introduced by the non-indigenous settlers. For non-Indigenous people to own land, one must be able to define the area, by fences or other means, and provide some sort of evidence of ownership, such as a title. This understanding was foreign to the indigenous people who saw land or country in very different terms. For them, country was both the provider and something to be cared for. Care for the land was the responsibility of all people and was enshrined through social, cultural and spiritual practices.

Birrigai Rocks, Tidbinbilla and the Southern Alps

Certain places, such as museums, churches and houses of Parliament are generally believed to be places of social, cultural and/or spiritual significance for non-indigenous people. Similarly, there are places considered to be significant or sacred by the Ngunnawal people. These places include Birrigai, Tidbinbilla and the Southern Alps. Aboriginal people from the area made the annual trek to these places to engage in social, cultural and spiritual ceremonies and practices.

River corridors as pathways

Ngunnawal country is a vast area with a wide variety of terrains and environments. People used natural features such as the stars and significant landmarks to navigate their way across the land. The Birrigai rocks were an important natural landmark for people making this journey. They followed river corridors including those of the Shoalhaven, Murrumbidgee, Molonglo and other rivers. The river corridors provided a wide variety of flora and fauna as a readily available food source.



units of work: **early childhood**

Natural resource management

The traditional lifestyle of the Ngunnawal people maintained the balance of flora and fauna populations. People only used what was required to meet immediate needs. Discussions about management of natural resources, and adjustments to accommodate natural cycles and systems, formed part of 'men's business' and law making. These discussions and natural resource management practices were embedded in stories, acted out in dance and embodied in ceremony. Natural resource management was a manifestation of spirituality.

Totems

One of the most visible manifestations of care for country and balancing animal and plant populations was the bestowing of animal totems on individuals and tribes. An individual could have an animal such as the kangaroo or grass parrot as their totem. These totems identified a specific relationship and responsibility for care and protection between the owner of the totem and the animal.

Spirituality

For the Ngunnawal, as for all Indigenous Australians, spirituality is more than religion. It is a deep and complex system of beliefs and practices that governs social and cultural interactions. Whilst ceremonies were carried out at particular times and for specific purposes, spirituality formed the very fibre of daily life. Just as care for the land and management of natural resources were seen to be everyone's responsibility, so to was the consumption and use of those resources. The way of life dictated that you didn't ever take more than you required for your immediate needs and that you shared what you had with your community.

The Dreaming

Concepts of time are diametrically opposed for traditional indigenous and for non-indigenous Australians. For non-indigenous Australians, time is something that can be measured, used, and owned. It is a commodity that can be bought and sold. Indigenous Australians view time differently. Certainly it can be measured by day and night and marked by seasons, but it is not viewed as a commodity to be owned or sold. It is a continuum from the beginning, the dreaming, through to the future, the dreaming. Time spent in meeting basic needs, in ceremony, in discussion or telling stories, is time spent dealing with the important things of life, and therefore living out one's spiritual beliefs. Time is the dreaming.

Culture clash

It is arguable that the concepts of time and spirituality embodied the biggest differences between the way of life for the Ngunnawal and the non-indigenous new settlers.

Sharing our culture

The natural resource management practices of the traditional Ngunnawal people were based on working with natural cycles and systems. Today, these practices are recognised as being based on scientific principles and form the basis of contemporary sustainable practices. Teaching students about the natural resource management practices of the Ngunnawal people is a way of understanding and valuing Aboriginal culture, investigating sustainable practices and building optimism for the future.

A reference list is supplied as part of the Teacher Information Kit

Unit Description

The units of work in *Understanding the Land through the Eyes of the Ngunnawal People An Aboriginal Natural Resource Management Program for ACT schools* are designed to develop student understanding of traditional care for country and natural resource management practices of the Ngunnawal people. The Ngunnawal have sustained their way of life over more than twenty-one thousand years. Natural resource management practices are an integral part of Ngunnawal spirituality and culture. Student understanding of the traditional land management practices, and interrelationship between the elements of the natural environment, will lead to both a deeper understanding and appreciation of the Ngunnawal way of life and the need for ongoing natural resource management.

The units of work have been developed in consultation with the Ngunnawal Elders Council and are supported by a DVD. It is intended that teachers delivering the program view the DVD and read the Essential Teacher Understandings before embarking on the unit of study. A student excursion to a significant location on Ngunnawal land is an important part of this unit of work. The Tharwa Sandwash on the Murrumbidgee River, is the location used for the DVD which accompanies this unit of work.

Within a school curriculum Scope and Sequence, it is most likely that students will only once study a unit of work on Aboriginal Natural Resource Management. Therefore, the Big Understandings, Attitudes and Values and Focus Questions are the same for the units in all Bands of Development. The Essential Content and the scope and breadth of student understandings deepen as students' progress from Kindergarten to Year 10.





Band of Development: Early Childhood

Year level: 2
Key Learning Area: SOSE or Science
Unit duration: Eight to ten weeks

big understandings

Expanded by Band of Development see Attachment 1

1. Value and respect Aboriginal natural resource management practices and knowledge.
2. Ngunnawal country is a traditional definition of territory which has been inhabited for over 21,000 years and is recognised as a meeting place for Aboriginal people from ACT and surrounding regions.
3. Respect of local Ngunnawal people is developed through understanding their traditional knowledge and practices, roles and responsibilities and following their cultural protocols.
4. Land management requires deep knowledge and understanding of the elements of the environment, the land, water, flora and fauna and their interdependence.
5. Aboriginal land management is based on the traditional knowledge and practices built on deep understanding of the relationships between natural systems and cycles within the landscape.
6. Natural resource management is constantly evolving based on increasing scientific understanding of the local environmental system.

attitudes and values

1. Develop curiosity, interest and ownership of the local environment in which students live.
2. Develop a respect for living things and natural systems.
3. Appreciate the intrinsic value of the natural world and the need to preserve the environment and natural heritage for future generations.
4. Develop a sense of optimism for the future by understanding that it is possible to use minimal resources to live comfortably within a specific environment.
5. Value and respect Aboriginal peoples, both past and present, and their cultures and spiritual connections to country.

essential learning achievements

Expanded by Band of Development see Attachment 2

- ELA 2. The student understands and applies the inquiry process
- ELA 19. The student understands and applies scientific knowledge
- ELA 20. The student acts for an environmentally sustainable future
- ELA 21. The student understands about Australia and Australians

focus questions connected to stages of learning sequence

Expanded Stages Of Learning Sequence see Attachment 3

connect

Where is the land area we are talking about?
 Who are the Ngunnawal?

contextualise

What is the importance of the natural resources, land, water, plants and animals, in the environment?

conceptualise

How has the traditional balance of the land been maintained?
 How did the Ngunnawal people use the land?

communicate

What can we learn from the past?

connect

Focus Questions: **Where is the land area we are talking about?**
Who are the Ngunnawal people?

essential content

In the Early Childhood band of development, students have opportunities to understand and learn about/learn to:

- 2.EC.1** explore inquiry as a useful process for creating knowledge and understanding the world around them
- 2.EC.5** make observations about what is happening around them using their senses
- 20.EC.3** how people cooperate to care for places in a community

assessment tasks

Develop an illustrated diagram of a place that is special to you. Make a list of points, or give an oral explanation, showing why this is special.

Use these understandings to project onto why Ngunnawal country is special for the Aboriginal people who have lived here and live here now.

Identify a place within the ACT and identify stakeholders who would want to care for that place. Develop some possible strategies for the care of that place and of the natural resources it contains.

teaching and learning activities

Why places are special

As a group, brainstorm the special places that mean something personally e.g. house, garden, park, river, mountains and discuss why they are special. Categorise and record responses.

My special place

Explore a special site within the school grounds and encourage the students to sit quietly and use their senses to feel the features of the environment. Classify their impressions as to what students could see, hear, smell and touch. Make a visual and text record of impressions.

Your land, my land

Develop the land ownership concept by using the school site to explain why the school land is special to people at the school. What is it used for? Who comes here? What do people do here? Make the comparisons to Ngunnawal land.

Land ownership

Explore the concept of ownership of the land. Juxtapose the Ngunnawal understanding of land as the provider to be cared for by all people, with the understanding of the new settlers that land was a commodity, to be exploited and which could be owned by individuals.

What makes us special

Describe the uniqueness of a family or other group such as a class or team and how that is preserved through shared knowledge and history. Use a concept map or other tool to record group characteristics. Extrapolate how this relates to the uniqueness of the Ngunnawal people.

Changing lifestyles

Discuss how changing times have made a difference to the lifestyles of the Ngunnawal people. Investigate lifestyle changes that have occurred in Canberra in the last fifty years e.g. food packaging and storage, transport, money. Discuss these changes by formulating questions about change and development. Include questions about access to resources to meet basic needs. Discuss whether these come from the land as a primary source or whether we access them some other way. Record children's responses. Generalise about causes and response of changed access to, and use of, natural resources pre and post-settlement.

Acknowledgement of Country

Familiarise students with the acknowledgement of country used on formal occasions and at public ceremonies. By asking why we use this acknowledgement, develop the understanding that their home, school and suburb and the ACT is in Ngunnawal land.

contextualise

Focus Question: What is the importance of the natural resources; land, water, plants and animals, in the environment?

essential content

In the Early Childhood band of development, students have opportunities to understand and learn about/learn to:

- 19.EC.6** obvious features of a variety of plants and animals
- 19.EC.9** some of the ways in which living things depend on their environment and each other (e.g. basic needs for survival) food and shelter

assessment tasks

Make a diagram, flow chart or other visual tool to illustrate the special characteristics and features of some local plants and animals. Show how these species are adapted to their environment.

Develop a matrix which shows the conditions specific plants and animals need to survive.

19.EC.11 some of the ways in which living things depend on the Earth (e.g. soil, water, air) and are affected by its changes.

19.EC.13 observe, identify and describe features, properties and the ways things change

19.EC.15 talk about their investigations and observations

20.EC.2 different living things in their local environment and some observable relationships between living things and their environment

20.EC.1 elements of the natural environment that humans, animals and plants need for survival

20.EC.3 how people cooperate to care for places in a community

21.EC.6 individuals and groups in the community (e.g. through simple information texts, family histories, Dreaming stories, folk tales)

Draw two contrasting diagrams to show a situation where there is balance between plant and animal populations where the natural resources are cared for and where there is an invasion of feral plants.

Draw a web of life for a specific ecosystem you would expect to find in the site chosen for the excursion. Make fact cards for some specific invasive plants and animals found at the site. On each card show how the species is spread and its destructive impact on natural resources.

Develop a wall chart to show groups of people who use the site and strategies they can use to care for the place.

teaching and learning activities

Natural resources

Identify natural resources such as water, land, plants, and animals. Categorise, classify and explore their characteristics and how they are used by people.

Biodiversity

Identify a small selection of plants - grasses, shrubs, trees and aquatic plants and animals - insects, fish, reptiles, birds and mammals, which are found in the local region. Create a graphic organiser to show their habitats in terms of shelter, food, water use and natural predators.

Food chains and webs of life

Show the interdependence of the identified animals and plants using food chains and web-of-life diagrams.

Use a basic food chain - 2 components only, e.g. kangaroos eat grass, fish live in water, birds build nests and live in trees or on the ground - to show how plants and animals are dependent on each other.

Investigate how this interdependence is effective if there is sufficient water and usable land available.

Native feral and domestic plants and animals

Establish criteria and classify animals into the categories of native, domestic and feral.

Investigate introduced plants and animals that have become problems in the environment and identify the reasons for this, e.g. pasture grasses introduced for fodder for domestic animals became feral in the new environment and rabbits introduced as a food source escaped and spread widely throughout the land.

Interpreting Maps

In general terms, discuss geographic maps of Australia, New South Wales and the ACT. Overlay these with the Map of Aboriginal Australia and a map of the states and territories of Australia.

Explaining phenomenon

Immerse in Aboriginal folktales, read, retell and consider the significance of these stories in an oral tradition. Where possible use local stories and contextualise situations.

conceptualise

Focus Questions: How did the Ngunnawal people use the land?
How has the traditional balance of plant and animal diversity been maintained in Ngunnawal land?

essential content

In the Early Childhood band of development, students have opportunities to understand and learn about/learn to:

- 2.EC.9** follow suggestions to order and present data or information (e.g. grouping or sequencing, drawing, simple table, graph)
- 19.EC.9** some of the ways in which living things depend on their environment and each other (e.g. basic needs for survival) food shelter
- 19.EC.11** some of the ways in which living things depend on the Earth (e.g. soil, water, air) and are affected by its changes
- 19.EC.13** observe, identify and describe features, properties and the ways things change
- 20.EC.1** elements of the natural environment that humans, animals and plants need for survival

assessment tasks

Use a simple story to show why respect for elders and for traditions is an effective practice for maintaining relationships between people, and between people and their environment.

Develop a flow chart to show special roles and responsibilities of traditional Ngunnawal family groups.

Use a diagram or flow chart to show how native plants and animals have natural predators and climatic conditions to control their populations, and how this may not apply to invasive species such as rabbits and blackberries.

teaching and learning activities

Basic human needs

Differentiate between needs and wants, and identify the range of basic human needs. Consider how those needs would be met by traditional Ngunnawal people and how they could be met by people living in the local suburb today. Sort and classify responses by developing a labelled diagram or wall chart.

Firestick farming

Investigate traditional forms of natural resource management, in particular, the diverse uses of firestick farming. Use a visual organiser to identify and demonstrate some of the purposes of this tool.

Balancing plant and animal populations

Develop a role play of members of Ngunnawal people considering the need to balance the populations

of kangaroos, grasses and parrots. Refer to Teachers Support DVD for information on this traditional method of population control. An important concept in understanding how this balance was maintained is the practice of only using what is necessary to meet basic needs. This ensures that vital resources are not depleted.

Using resources wisely

Use the example of the culling of kangaroos to illustrate the use of resources. An example of this is where a kangaroo is killed, not directly to meet the need for food, but for population control, it is probable that neighbouring family groups would have been invited to share the extra food. That would have resulted in a corroboree, a social occasion and the sharing of food, stories and information.

Roles and responsibilities

Use the DVD and other information sources to show the ways men and women took on specific roles and responsibilities. Speculate on the notion of childhood and children's responsibilities as carers for the younger children.

Consider the transmission of knowledge in a society with an oral tradition and the ways this knowledge was passed on through sharing stories, ritual and dance. Speculate on the ways children would have learnt by informal rather than formal learning and how respect for elders and for maintaining traditions was an important part of maintaining the culture.

Changes over time

Identify some key changes to the traditional way of Aboriginal life since the introduction of domestic plants and animals and the establishment of farms on traditional lands.

Investigate the impact of building roads, dams, towns and cities and the introduction of rapidly changing forms of transport on the traditional forms of land management. Speculate on modern ways of maintaining populations of native and feral plants and animals. Consider the implications of working within natural cycle in the case of specific plants and animals such as kangaroos and rabbits, blackberries and Cootamundra wattles.

Record all responses to guiding questions, rate them in terms of relevance and sequence accordingly.

Feral plants and animals

Investigate plants and animals which have escaped from these domestic situations to become invasive and feral. Use questions and responses to speculate on why introduced plants and animals have adapted well to new environments. Consider natural predators, growth promoting elements such as sunshine, access to water and soil suitability.

Create a cause and effect chart to illustrate these adaptations.

Examples suitable to demonstrate this situation include rabbits, foxes, blackberries and Patterson's Curse. Create a fact file on these and other plants and animals.

Create a story to elaborate a key point e.g. fences are built on traditional hunting grounds which include a river.

Geographic features

Study a map of geographic features of the Ngunnawal land and the surrounding areas including the Southern Alps.

Speculate as to why rivers would make good walking routes in traditional times. Consider the importance of landmarks such as Gibraltar Rocks.

communicate

Focus Question: What can we learn from the past?

essential content

In the Early Childhood band of development, students have opportunities to understand and learn about/learn to:

- 2.EC.9** Follow suggestions to order and present data or information (e.g. grouping or sequencing, drawing, simple table, graph)
- 2.EC.12** share and communicate observations, findings, ideas and understandings
- 19.EC.15** talk about their investigations and observations
- 20.EC.6** share responsibility for the quality of their immediate environments and for resource conservation
- 21.EC.5** Indigenous people as the first Australians and aspects of Australia's history predating British colonisation

assessment tasks

Identify some plants and animals that were used by Aboriginal people. Discuss whether they should still be used today. Kangaroos, possums, cumbungi reeds and tea tree are suitable for this activity.

Develop a modern care plan for the excursion site that uses some of the natural resource management strategies of traditional Ngunnawal people.

Make a whole class action plan for the inclusion of some native plants in the school gardens. Discuss how the inclusion of these plants may support native flora and fauna.

teaching and learning activities

Changes over time

Develop a timeline to demonstrate the increasing rate of change over the last 200 years in the areas of transport, road usage, landmarks, food sources and storage, and growth of towns and cities.

Oral traditions

Retell or create a story that shows an important aspect of natural resource management in traditional Ngunnawal life. Create a story to tell how the same aspect of life is managed in modern times.

Protecting biodiversity for the future

Visit a location such as Black Mountain or a local park or nature reserve. Develop a plan for meeting basic survival needs in this environment. Where would you go to obtain water? What plants, berries and fruits could you eat? Are there any supplies of fish, bird or animals that you could use as a source of food?

Develop a role play about group actions and responsibilities and practices necessary to survive in a specific harsh local environment.

units of work: later childhood

Unit Description

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The units of work have been developed in consultation with the Ngunnawal Elders Council and are supported by a DVD. It is intended that teachers delivering the program view the DVD and read the Essential Teacher Understandings before embarking on the unit of study. A student excursion to a significant location on Ngunnawal land is an important part of this unit of work. The Tharwa Sandwash on the Murrumbidgee River, is the location used for the DVD which accompanies this unit of work.

Within a school curriculum Scope and Sequence, it is most likely that students will only once study a unit of work on Aboriginal Natural Resource Management. Therefore, the Big Understandings, Attitudes and Values and Focus Questions are the same for the units in all Bands of Development. The Essential Content and the scope and breadth of student understandings deepen as students' progress from Kindergarten to Year 10.





Band of Development: Later Childhood

Year level: 5
Key Learning Area: SOSE or Science
Unit duration: Eight to ten weeks

big understandings

Expanded by Band of Development see Attachment 1

1. Value and respect Aboriginal natural resource management practices and knowledge.
2. Ngunnawal country is a traditional definition of territory which has been inhabited for over 21,000 years and is recognised as a meeting place for Aboriginal people from ACT and surrounding regions.
3. Respect of local Ngunnawal people is developed through understanding their traditional knowledge and practices, roles and responsibilities and following their cultural protocols.
4. Land management requires deep knowledge and understanding of the elements of the environment, the land, water, flora and fauna and their interdependence.
5. Aboriginal land management is based on the traditional knowledge and practices built on deep understanding of the relationships between natural systems and cycles within the landscape.
6. Natural resource management is constantly evolving based on increasing scientific understanding of the local environmental system.

attitudes and values

1. Develop curiosity, interest and ownership of the local environment in which students live.
2. Develop a respect for living things and natural systems.
3. Appreciate the intrinsic value of the natural world and the need to preserve the environment and natural heritage for future generations.
4. Develop a sense of optimism for the future by understanding that it is possible to use minimal resources to live comfortably within a specific environment.
5. Value and respect Aboriginal peoples, both past and present, and their cultures and spiritual connections to country.

essential learning achievements

Expanded by Band of Development see Attachment 2

- ELA 2. The student understands and applies the inquiry process
- ELA 19. The student understands and applies scientific knowledge
- ELA 20. The student acts for an environmentally sustainable future
- ELA 21. The student understands about Australia and Australians

focus questions connected to stages of learning sequence

Expanded Stages Of Learning Sequence see Attachment 3

connect

Where is the land area we are talking about?
 Who are the Ngunnawal?

contextualise

What is the importance of the natural resources, land, water, plants and animals, in the environment?

conceptualise

How has the traditional balance of the land been maintained?
 How did the Ngunnawal people use the land?

communicate

What can we learn from the past?

connect

Focus Questions: **Where is the land area we are talking about?**
Who are the Ngunnawal people?

essential content

In the Later Childhood band of development, students have opportunities to understand and learn about/learn to:

- 2.LC.3** create questions and predictions for investigation
- 2.LC.5** contribute to planning a variety of investigations
- 21.LC.3** where Ngunnawal people lived prior to colonisation
- 21.LC.3** the ways Australia's Indigenous peoples lived prior to colonisation

assessment tasks

- On a map of Ngunnawal land, show examples of significant places where Ngunnawal people met for specific purposes and how this connects to Canberra as a contemporary meeting place.
- Map the borders of Ngunnawal country and the ACT and highlight the congruent areas.
- Explain the relevance of the Acknowledgement of Country on formal occasions.
- Describe some of the ways the traditional Ngunnawal lifestyle was built around care and respect for natural resource management.

teaching and learning activities

Significant sites in the ACT and environs

Discuss what makes a site significant and the reasons why people connect to significant places. Brainstorm sites in the ACT region, discuss their relevance and display results. Choose a site to explore which is relevant to the group. Clarify whether this site has historical, social and/or spiritual importance. Explore why and how people use this site to meet.

Ngunnawal land

Brainstorm to determine what students know about Ngunnawal land. Structure questions to capture the understandings that Ngunnawal land has been inhabited for over 20 000 years and is a traditional definition of territory and has been a traditional meeting place for that time.

Display and discuss the Tindale's map of Aboriginal Tribes of Australia (1974). Have students mark the place that they are from or where they now live. Locate Ngunnawal country on a map. Overlay ACT borders for comparison. Discuss the areas of congruency.

Acknowledgement of Country

Familiarise students with the acknowledgement of country used on formal occasions and at public ceremonies. Asking why we use this acknowledgement, develop the understanding that their home, school and suburb and most of the ACT is on Ngunnawal land.

The Ngunnawal people

Use the Tindale's map of Aboriginal Tribes of Australia (1974) to demonstrate that there are many traditional Aboriginal language groups.

Build the understanding that traditional Aboriginal tribes have defined roles and responsibilities for all members built on totems, spirituality and connection with the land.

Use the Teacher support materials to show how the Ngunnawal people have six major clans each of which is made up of family groups. Traditionally, these tribes have joined with tribes from surrounding areas to make the annual journey to the area of Tidbinbilla ranges. This annual journey was made for the purpose of holding ceremonies, making laws, arranging marriages and to trade goods. It coincided with the annual migration of the Bogong moths to the same area.

Aboriginal society

Discuss own family and community hierarchy. Compare and contrast to Ngunnawal community hierarchy. Explain roles and responsibilities of community members and that each person's totem determines responsibilities for care and passing on knowledge of a particular species. Show how the Traditional Ngunnawal language group was made up of family groups, six clans who lived in a local area and how they formed a tribe characterised by a common language and how that tribe interacted with neighbouring tribes on an annual basis. Compare this with their own family group, their suburb or wider community, their place within the ACT and the place of the ACT within Australia.

Use of evidence to support findings and conclusions

Discuss the place of evidence to verify information as opposed to conjecture.

Discuss where you would go for evidence to support research into understanding about Ngunnawal land and culture. Consider the reliability of evidence. Sort understandings into supported by evidence and unsupported by evidence.

contextualise

Focus Questions: What is the importance of the natural resources of land, water, plants and animals in the environment?

essential content

In the Later Childhood band of development, students have opportunities to understand and learn about/learn to:

- 2.LC.3** create questions and predictions for investigation
- 2.LC.5** contribute to planning a variety of investigations
- 2.LC.7** collect and record data
- 2.LC.13** discuss and compare results with their questions and predictions, and draw conclusions
- 19.LC.12** identify and describe some interactions between living things, and between living things and their environment
- 19.LC.17** observe, explore, investigate, consider, identify, describe natural phenomena and living and non-living things
- 20.LC.1** identify and describe some natural cycles and systems in the environment (e.g. food chains, food webs)
- 20.LC.2** understand the concept of habitat and the diversity of living things within a habitat
- 20.LC.7** observe and gather data about local environments and changes over time due to human or natural events (e.g. Tharwa Sandwash, Tidbinbilla, Namadgi)

assessment tasks

Use pictures and text to explain the concept of habitats and ecosystems and to illustrate the diversity of living things within an ecosystem.

Develop a map of the Tharwa Sandwash or similar location marking habitats and ecosystems.

Use illustrated diagrams to explain habitats, ecosystems and explain a food chain. Diagrammatically or orally, show how food chains are disrupted by the invasion of feral species and/or disruption to natural water cycles.

teaching and learning activities

Australia is a unique and ancient land. Ngunnawal country has a diverse ecosystem. Ngunnawal country is a geographical place, where things are, and the location affects people's lives and resources. Explain diverse environments of the region: woodlands, grasslands, wetlands and forests. Explain how the river corridors provided walking paths and Gibraltar/Birrigai Rocks provided a landmark to Tidbinbilla and the mountains beyond. Build understanding of the importance of Tidbinbilla as a meeting place for all the tribes and as a place of ceremony.

Maps

Develop a map showing the various environments and major physical features such as mountains and rivers. Mark the various environments. Show Canberra city, your local suburb, Tharwa Sandwash or excursion site, Gibraltar/Birrigai Rocks and Tidbinbilla on the map.

Excursion to the Tharwa Sandwash

Pre-excursion:

Develop a set of predictions about what you will see in terms of landmarks, water, plants and animals. Include questions, predictions about distance and make some assumptions.

Discuss the traditional way of learning for Ngunnawal children, look, listen and learn. Compare this with modern scientific inquiry.

On site:

Take time to connect with the place in order to observe, explore and investigate the site. Identify and describe features of some elements of living and non-living things, the river and the surrounding hills. Observe and describe some interactions between living things, and between living things and the environment (relationships within food chains). Compile data evidence e.g. record information from tourist guides, photos, videos, pictures and mind maps.

Post-excursion :

Compare results with questions and predictions, and draw conclusions about Tharwa Sandwash habitat diversity, food chains and changes over time. Discuss, classify and interpret information gathered. Explain how the Ngunnawal people connected to and used the land with respect as custodians.

Biodiversity

Make lists of the biodiversity of the area under the following headings living and non living, plant and animal, aquatic and terrestrial. Use images (illustrations or photographs) and text.

Within these categories, sort and classify the species as grasses, shrubs or trees as invertebrates, insects, amphibians, reptiles, birds, monotremes and mammals. You may use additional classifications.

Definitions

Define and give examples of ecosystems and habitats, food chains and webs of life.

Choose a major species from each of the major classifications and develop an illustrated diagram of its life cycle, habitat, place in the ecosystem, food chain and web of life.

Use of natural resources

As a whole class develop a matrix to show a range of animals and plants and their uses to Ngunnawal people. Develop a Fact File for a specific vulnerable plant and animal. Show it at different stages of its life cycle. Clearly describe its use by the Ngunnawal people and the way they managed to ensure it was an ongoing resource.

conceptualise

Focus Questions: How has the traditional balance of the land been maintained?

How did the Ngunnawal people use the land?

essential content

In the Later Childhood band of development, students have opportunities to understand and learn about/learn to:

2.LC.10 search for information and use a range of sources

assessment tasks

Use research to substantiate specific examples of respect guiding relationships between people and their environment.

20.LC.3 some effects of human action on natural environments (land clearing, introduced species, soil erosion, water pollution)

21.LC.1 a range of natural features in the Tharwa Sandwash and how people have shaped this environment

21.LC.3 ways the Ngunnawal people lived prior to colonisation

21.LC.9 the influences of Indigenous peoples on the valuing of Australian places

Develop a guide to show how specific plants and animals were used by the Ngunnawal to meet their basic needs and the consumption was managed to ensure they remained a natural resource.

Use a specific location such as the Tharwa Sandwash to demonstrate the interrelationship between rivers as walking routes, biodiversity of the river corridor and food, and provision of resources, such as wood for tools, fur for warmth. Represent this using text and image.

Retell the story of the kangaroo and the grass parrot to explain totems, roles, responsibilities and knowledge that are an expression of spirituality and natural resource management.

teaching and learning activities

Sandwash Investigation Project

Students assume the role of natural resource managers to develop new signage for the Tharwa Sandwash site. The task is to create an interesting series of information displays.

Project requirements

An information board is required to demonstrate each of the following concepts:

- Ngunnawal people are custodians and their land management is based on traditional knowledge and practice
- care of land is an expression of spirituality and connection with the land as the mother, the provider
- managing land means managing plant and animal populations and maintaining the balance between populations
- examples of firestick farming to control mistletoe infestations and maintaining the relationships between kangaroo and grass parrot populations
- Ngunnawal technology including rope, spear and woomera making
- food gathering including use of wattle seeds and kurrajong seeds
- use of Ngunnawal language such Murrumbidgee e.g. murrum means big, biggee means water.

Conduct searches for information using a range of sources (e.g. information texts, artefacts, maps, images, oral histories).

Philosophical questions for discussion

How gradually did the lands of Ngunnawal country change after the arrival of European settlers to the area and how did this affect the original inhabitants?

If the post contact settlers of Ngunnawal lands had been able to communicate with the Ngunnawal people, would they have used the natural resources of land, water, plants and animals differently?

What were the main catalysts for new settler population growth and for change to the landscape?

communicate

Focus Question: What can we learn from the past?

essential content

In the Later Childhood band of development, students have opportunities to understand and learn about/learn to:

- 2.LC.13** discuss and compare results with their questions and predictions, and draw conclusions
- 2.LC.16** reflect on their inquiry experience, identify what went well and difficulties encountered, and suggest improvements to the investigation.
- 19.LC.16** identifiable causes for some of the short and long-term changes to the surface of the Earth or the atmosphere (land clearing, introduced species, soil erosion, water pollution).
- 20.LC.10** explore probable and preferred futures in relation to environmental issues familiar to them and discuss actions needed to make preferred futures happen.

assessment tasks

- Develop an environmental action plan for the site used for the class excursion that reflects the strategies used by the Ngunnawal to conserve natural resources.
- Develop a brochure which describes the features and attributes of a specific location, possible excursion site. Propose changes that would encourage more tourists, but would be offset by actions they could take to protect the area.
- Use a cause and effect diagram or a consequences wheel to identify and explain several of the detrimental impacts to the traditional Ngunnawal lifestyle caused by the introduction of farming to the area.

teaching and learning activities

Effects of human action on the Tharwa Sandwash environment

Display and analyse photos and reports from other sources of primary evidence of the region in the past and present. Compare and contrast natural features of the habitat now and in the past, e.g. amount of vegetation/trees, water quality, amount of introduced weeds etc. Identify causes of the short and long term changes to the habitat.

Strategies for raising awareness of historically and environmentally significant sites

Discuss Tharwa Sandwash as a specific location on the Murrumbidgee corridor and what made it a useful stopover site on the trek to the Tidbinbilla ranges.

Develop an illustrated map with appropriate signage that could be used for a guided walk along the Murrumbidgee corridor.

Role plays and re-enactments

Role play a possible conversation between a fifth generation farmer from the area and an environmentally aware grandchild. Consider change and consequences of human action through land management practices such as land clearing, fertilising, grazing etc.

In small groups, choose a human action that has impacted in a positive or negative way on the habitat and how people interact with the site. Dramatise the consequences of this action on the land and the way people are able to interact with this site in the present day.

units of work: early adolescence

Unit Description

The units of work in *Understanding the Land through the Eyes of the Ngunnawal People An Aboriginal Natural Resource Management Program for ACT schools* are designed to develop student understanding of traditional care for country and natural resource management practices of the Ngunnawal people. The Ngunnawal have sustained their way of life over more than twenty-one thousand years. Natural resource management practices are an integral part of Ngunnawal spirituality and culture. Student understanding of the traditional land management practices, and interrelationship between the elements of the natural environment, will lead to both a deeper understanding and appreciation of the Ngunnawal way of life and the need for ongoing natural resource management.

The units of work have been developed in consultation with the Ngunnawal Elders Council and are supported by a DVD. It is intended that teachers delivering the program view the DVD and read the Essential Teacher Understandings before embarking on the unit of study. A student excursion to a significant location on Ngunnawal land is an important part of this unit of work. The Tharwa Sandwash on the Murrumbidgee River, is the location used for the DVD which accompanies this unit of work.

Within a school curriculum Scope and Sequence, it is most likely that students will only once study a unit of work on Aboriginal Natural Resource Management. Therefore, the Big Understandings, Attitudes and Values and Focus Questions are the same for the units in all Bands of Development. The Essential Content and the scope and breadth of student understandings deepen as students' progress from Kindergarten to Year 10.





Band of Development: Early Adolescence

Year level: 8
Key Learning Area: SOSE or Science
Unit duration: Eight to ten weeks

big understandings

Expanded by Band of Development see Attachment 1

1. Value and respect Aboriginal natural resource management practices and knowledge.
2. Ngunnawal country is a traditional definition of territory which has been inhabited for over 21,000 years and is recognised as a meeting place for Aboriginal people from ACT and surrounding regions.
3. Respect of local Ngunnawal people is developed through understanding their traditional knowledge and practices, roles and responsibilities and following their cultural protocols.
4. Land management requires deep knowledge and understanding of the elements of the environment, the land, water, flora and fauna and their interdependence.
5. Aboriginal land management is based on the traditional knowledge and practices built on deep understanding of the relationships between natural systems and cycles within the landscape.
6. Natural resource management is constantly evolving based on increasing scientific understanding of the local environmental system.

attitudes and values

1. Develop curiosity, interest and ownership of the local environment in which students live.
2. Develop a respect for living things and natural systems.
3. Appreciate the intrinsic value of the natural world and the need to preserve the environment and natural heritage for future generations.
4. Develop a sense of optimism for the future by understanding that it is possible to use minimal resources to live comfortably within a specific environment.
5. Value and respect Aboriginal peoples, both past and present, and their cultures and spiritual connections to country.

essential learning achievements

Expanded by Band of Development see Attachment 2

- ELA 2. The student understands and applies the inquiry process
 ELA 19. The student understands and applies scientific knowledge
 ELA 20. The student acts for an environmentally sustainable future
 ELA 21. The student understands about Australia and Australians

focus questions connected to stages of learning sequence

Expanded Stages Of Learning Sequence see Attachment 3

connect

Where is the land area we are talking about?
 Who are the Ngunnawal?

contextualise

What is the importance of the natural resources, land, water, plants and animals, in the environment?

conceptualise

How has the traditional balance of the land been maintained?
 How did the Ngunnawal people use the land?

communicate

What can we learn from the past?

connect

Focus Questions: **Where is the land area we are talking about?**

Who are the Ngunnawal people?

essential content

In the Early Adolescence band of development, students have opportunities to understand and learn about/learn to:

- 19.EA.3** how scientific understandings have changed over time and that different cultures may have different views in relation to scientific practice (e.g. traditional cultural explanations of phenomena and practices in areas such as medicine)
- 20.EA.5** Australia's Aboriginal and Torres Strait Islander peoples
- 21.EA.5** the importance of 'country' to Australia's Aboriginal and Torres Strait Islander peoples (e.g. different ways individuals are related to the land)
- 21.EA.9** use geographical language, tools and conventions to interpret and create representations of Australia's physical and human geography (e.g. a variety of maps, diagrams, images and data)

assessment tasks

Use an investigation into the impact of a specific feral animal or plant to demonstrate the inquiry process.

On a map show the boundaries of the ACT and of Ngunnawal country. Highlight the areas that are congruent and show the key geographic features.

Write an explanation of the significance of the Acknowledgement of Country that could be used in an information booklet for a visitor to the ACT.

Develop a series of illustrated diagrams to show how scientific principles were applied to the development of Aboriginal tools and cooking methods.

Use a flow chart to show how traditional practices such as firestick farming worked in with the annual trek by the Ngunnawal, and surrounding tribespeople, to the Tidbinbilla ranges.

SOSE teaching and learning	science teaching and learning
<p>Acknowledgement of Country</p> <p>Familiarise students with the Acknowledgement of Country used on formal occasions and at public ceremonies. By asking why we use this acknowledgement, develop the understanding that their home, school and suburb and most of the ACT is in Ngunnawal land.</p> <p>Geography</p> <p>Construct a map showing the boundaries of the Australian Capital Territory, Ngunnawal land and the areas which are congruent.</p> <p>Draw and label the key geographic features of the land and speculate on their use as a means of travel, transport and communication across the region.</p> <p>People</p> <p>Develop a graphic organiser to show the social structure of the Ngunnawal tribe. Include family groups, the six Ngunnawal clans and the five main neighbouring language groups with whom they interacted on an annual basis.</p> <p>Totems</p> <p>Investigate the significance of totems for individuals and for clans. Investigate the responsibilities associated with various totems and how these are connected to management of natural resources and reflected through spiritual beliefs.</p> <p>Language</p> <p>Develop a glossary of relevant terminology and place names that can be added to throughout the unit, e.g. Tidbinbilla - place, Murrumbidgee - place where waters meet, Woomera - spear thrower.</p>	<p>Acknowledgement of Country</p> <p>Familiarise students with the Acknowledgement of Country used on formal occasions and at public ceremonies. By asking why we use this acknowledgement, develop the understanding that their home, school and suburb and most of the ACT is in Ngunnawal land.</p> <p>Scientific Inquiry</p> <p>Compare the Aboriginal approach to learning which is one of Stop, Look and Learn to the Scientific Inquiry process. Draw out conclusions.</p> <p>Make a scientific observation of a local area by developing lists of animal and plant biodiversity and collecting data on populations. Develop a method of storing and sharing this information.</p> <p>Scientific explanation</p> <p>Investigate science as means of explaining phenomena. Show how this has changed over time due to greater contact between cultures, ease of transport and forms of communication. Explore ways in which Aboriginal people have used scientific discovery and application of natural resources to meet their basic needs e.g. tea tree as medicine, rocks as paint, animal grease as barriers to skin infections, woomeras to increase spear throwing distance.</p> <p>Aboriginal science and technology</p> <p>Investigate the scientific concepts behind the construction and development of a spear and woomera or spear thrower. Produce a model or illustrated diagram.</p> <p>Research the production of damper from wattle seed and develop an illustrated diagram showing the process from gathering seed to the final product.</p> <p>Totems</p> <p>Make a list of the most common Ngunnawal plant and animal totems. Use a diagram to show where these plants and animals occur in a web of life. Make a list of the most common characteristics of these plants and animals, and speculate on why they have significance as totems.</p>

contextualise	
Focus Question	What is the importance of the natural resources, land, water, plants and animals, in the environment?
essential content	assessment tasks
<p>In the Early Adolescence band of development, students have opportunities to understand and learn about/learn to:</p> <p>2.EA.8 access and interpret a range of primary and/or secondary sources of information (e.g. historical documents, images, oral histories, biographies, articles, media sources, statistical data sets)</p> <p>2.EA.9 evaluate the accuracy, relevance, completeness and credibility of data and information and their sources (e.g. recognise evidence, opinion, bias and perspective; identify credentials of authors or websites)</p> <p>19.EA.12 food chains and webs as models of relationships within living communities</p> <p>19.EA.15 explore, identify and model relationships (e.g. food chains and webs) to explain interrelationships and predict change</p> <p>20.EA.1 concepts of interdependence of living things, habitat and ecosystem</p> <p>21.EA.2 how the geography of Australia influences what people do to survive and prosper (e.g. where people live, the location of natural resources)</p> <p>21.EA.9 use geographical language, tools and conventions to interpret and create representations of Australia's physical and human geography (e.g. a variety of maps, diagrams, images and data)</p> <p>21.EA.11 find out about, discuss and evaluate historical events using appropriate genres, sources and evidence</p>	<p>Discuss the reliability of scientific evidence in an informed manner and use examples of research that has informed what we know about the lifestyle of the traditional Ngunnawal people.</p> <p>Providing visual and text evidence of the significant geographic or biodiversity features of the excursion site. Demonstrate understanding of traditional natural resource management to propose strategies for dealing with feral populations in the future.</p> <p>Develop a case study of a particular site along a river corridor. Include the impact of feral populations and changed human consumption on the current population. Kangaroos, wombats, possums and platypus or cumbungi, teatree, native raspberry or mistletoe would make good subjects for investigation.</p> <p>Develop a promotion for river corridors as venues suitable for reconnection with Ngunnawal culture.</p> <p>Discuss all attributes and variability of terrain.</p>

SOSE teaching and learning

Authenticity of evidence

Discuss the requirements of authentic evidence. Consider the implication of personal bias, validation of opinion or need, primary and secondary evidence, oral and written records.

Accessing historical records and using contemporary information sources to collect information. Sorting and selecting information on the basis of accuracy and reliability.

Basic needs

Develop a matrix of basic human needs contrasted with wants. Show how the Ngunnawal people used the natural resources of the land to meet their needs. Revisit this activity after the excursion to verify or add to this matrix.

Importance of Ceremony

Make a concept map showing why people hold significant ceremonies and how this is an important socio-cultural feature. From this extrapolate why ceremonies would be important to traditional Ngunnawal people.

Excursion to Tharwa Sandwash

Geographical features

Conduct an excursion to the Tharwa Sandwash area. Make visual records and written impressions of the area, river corridor, riparian plains, swales, feeder creeks, braided river, river in flood, soil and rock types, visible landmarks and features.

Mapping of rivers

Map the rivers of Ngunnawal land and show their place as part of the Murray Darling system.

Mark in the rivers that formed the pathways to Tidbinbilla.

science teaching and learning

Authenticity of evidence

Discuss the requirements of authentic evidence. Consider the implication of personal bias, validation of opinion or need, primary and secondary evidence, oral and written records.

Accessing historical records and using contemporary information sources to collect information. Sorting and selecting information on the basis of accuracy and reliability.

Excursion to Tharwa Sandwash

Biodiversity

Conduct an excursion to the Tharwa Sandwash area. Collect evidence of the land forms, plants and animals of the area. Use population surveys, take measurements, collect data and make visual recordings of the area.

Use these in follow up activities to ensure students understand the differences between biotic and abiotic features, habitats, communities, ecosystems and environment.

Basic needs

Develop a matrix of basic human needs. Show how the Ngunnawal people used the natural resources of the land to meet their needs. Revisit this activity after the excursion to verify or add to this matrix.

Ecosystems and webs of life

Use illustrated diagrams to show the range of ecosystems found in the vicinity of the location of the excursion. Construct a web of life for one or more ecosystems.

Develop a model of a food web for the Tharwa Sandwash area. The rope interactions Web of Life game from Teach the Reach is a useful activity.

SOSE teaching and learning

Interconnection of places and rivers as walking routes

Investigate the use of rivers as walking tracks and of rocks and mountains as landmarks as people came to the areas of Tidbinbilla and the Southern Alps for the Aboriginal tribal lands surrounding Ngunnawal land.

Make assumptions about river corridors as the main walking and trade routes across Ngunnawal country. Verify assumptions using evidence.

Reliability of natural resources

Research weather patterns and climatic predictability over the last 200 years. From known data, investigate the reliability of plant and animal population in the area as dependable resources.

Use conjecture to formulate a rationale for the management of natural resources.

Develop a matrix of basic human needs, show how the Ngunnawal people used the natural resources of the land to meet their needs.

Historical evidence

Find evidence of Aboriginal occupation. Carbon dating of paintings, campfire - middens, stone tools and grinding sites. Bones and shells.

Explain the use of middens as a form of evidence. Research the trading traditions of people coming from coastal areas and other neighbouring tribal country to the annual ceremonies in the Tidbinbilla area.

Geology

Investigate the geological features of the ACT - e.g. granite tours of Birrigai and the rock shelters of Tidbinbilla. Research their significance as landmarks and as places of shelter and ceremony.

science teaching and learning

Biodiversity

Ngunnawal country is made up of a range of environments. Identify these on a map, describe the main characteristics of each and list the major types of animal and plant life of each area. Identify species common to all areas.

Create a graphic organiser of basic human needs.

Show how specific plants and animals found in the vicinity of Tharwa Sandwash, or the location chosen for the excursion, could be used to meet these needs.

Case Study

Conduct a case study of the usefulness of a particular plant or animal.

The bogong moth is an especially significant insect for the Ngunnawal people as the migration of moths to Tidbinbilla coincides with the annual gathering for ceremony, trade and law making. Develop a case study of the bogong moth showing lifecycle, migration, Aboriginal uses and management.

Rock Art

The use of rock art was an important way of marking area, recording events, and maintaining traditions. Investigate how ochre paints were produced and what additives were mixed in to ensure permanence. Research the properties of these additives such as blood and oils. Make connections to Aboriginal knowledge of science and scientific practices used today.

Scar trees and grinding stones

Scar trees and grinding stones are found at various locations throughout Ngunnawal country. Research their construction and uses and what we can extrapolate about lifestyles from examination of these tools.

conceptualise

Focus Questions: How has the traditional balance of the land been maintained?
How did the Ngunnawal people use the land?

essential content

In the Early Adolescence band of development, students have opportunities to understand and learn about/learn to:

- 19.EA.18** use their scientific understandings to consider and respond to appropriate ethical and social issues relevant to them
- 20.EA.3** some of the processes by which human activities change natural environments in positive and negative ways (e.g. reducing feral animal populations, tourism, deforestation)
- 20.EA.6** conduct case study investigations into local and/ or national ecosystems to identify changes and predict their impacts
- 21.EA.3** Indigenous perspectives of colonisation and how Indigenous peoples' lives were affected
- 2.EA.12** review their understanding in light of new information
- 2.EA.18** acknowledge sources of information using bibliographies.

assessment tasks

- Use the annual journey to Tidbinbilla to describe in some detail, one or more of the natural resource management practices of the Ngunnawal. Show how this practice was an expression, not only of caring for country, but of spiritual connection to the land.
- Presenting research to show how one's totem dictates one's responsibilities for land management.
- Develop models of tools and implements such as rope, axes, coolamons and woomeras. Demonstrate use in terms of scientific principles, management and supply of resources and transmission of production skills and techniques.
- Describe the concept of 'the dreaming' as a term that encapsulates understandings about time and continuity, spiritual beliefs, land management practices and responsible behaviour.

SOSE teaching and learning

Embedded land management practices

Investigate the key characteristics of Ngunnawal life, e.g. they were a nomadic people who spent most of their time in family groups and who joined together for ceremonies, they had an oral rather than a written tradition, spirituality and connection to land were closely interwoven. Demonstrate these interconnections as a flow chart.

science teaching and learning

Firestick farming

Investigate the various forms and uses of firestick farming as a method of managing the natural plant and animal resources.

Construct a chart showing the various types of plant and animal food sources that occurred in this region before contact with European settlers.

SOSE teaching and learning

Changing land use

Identify ways land use has changed since the arrival of the new settlers.

Construct a matrix showing categories of land use e.g. farming, mining, urban development and combine this with introduction of land change, e.g. introduction of new plant and animal species, disruption of land surface due to ploughing or mining, changes to water systems due to construction of weirs, dam and through increased consumption for a multitude of purposes.

Develop a timeline to show the increasing rapidity of change.

Create a cause and effect diagram to demonstrate the impact of these changes.

Managing change

Today scientists are very aware of the complex issues around changed populations of flora and fauna, particularly in terms of species loss, increasing destruction caused by feral plants and animals.

Develop case studies to highlight the impact of a particular invasive plant or animal. Include information around the possible benefits of introducing the species and its impact as a feral species.

Develop a case study of a native species such as kangaroos or the mistletoe plants which are a parasite on many eucalypt trees. Show actual benefits as a natural resource for humans and the negative effects if not well managed.

Natural cycles and systems

Draw conclusions about management practices and what can be learned from maintaining the natural balance. From this, extrapolate practices about working with natural systems and cycles. Identify current practices and speculate on the implications of these practices for effective land management practices in the future. Use evidence to support your work.

science teaching and learning

Men's Business, Women's Business

Tools and Implements

Gender specific roles and responsibilities were part of the Ngunnawal way of life. Each gender had developed tool and implements to assist with carrying these out.

Make a list of tools and implements used by men and by women. Choose several of these for closer investigation. Choose appropriate materials to make models.

Develop a matrix of tools and implements and the materials and techniques used for their production.

Construct model examples of Aboriginal technology and explain their suitability for the purpose. Choose from the following list:

- rope making for trapping animals such as wombats or fish
- spear making as a fighting or hunting tool
- the woomera as a tool to increase force and distance
- grinding stones to make flour from seeds and for grinding ochre to make paint from rocks.

Scientific principles

Research the scientific principles behind these models and describe them in detail. Use examples such as soaking particular seeds and nuts to release toxins, using slightly bent spears to improve area of impact on hitting a target.

communicate

Focus Question: What can we learn from the past?

essential content

In the Early Adolescence band of development, students have opportunities to understand and learn about/learn to:

- 2.EA.8** access and interpret a range of primary and/or secondary sources of information (e.g. historical documents, images, oral histories, biographies, articles, media sources, statistical data sets)
- 2.EA.12** review their understanding in light of new information
- 2.EA.13** draw reasonable conclusions based on analysis of data and information
- 2.EA.18** acknowledge sources of information using bibliographies.

assessment tasks

Prepare a presentation on the natural resource management practices of the traditional inhabitants of Ngunnawal country using flow charts and other tools to demonstrate the practise of working with natural cycles and systems.

Use a catastrophic event such as the 2003 bushfires to show how the use of traditional practices and working systems may prove to be the best strategy for managing current situations.

activities could be delivered in either SOSE or Science

Alternative farming methods and Intensive farming methods

Show how working with natural resource management practices is the premise behind many modern forms of farming. Examples of this include permaculture farming, the use of maintaining heavy vegetation on riparian plains and biodynamic farming. Develop a case study on one form and make projections about its future use.

Investigate a type of broadacre farming such as wheat or canola or modern method of salmon, trout, dairy or poultry production. Describe production and storage methods in terms of natural cycles and systems.

2003 Canberra bushfires

Use the 2003 Canberra bushfires to study the effects of land clearing and planting with a monocrop such as pines. Develop an illustrated diagram or flow chart to show the sequence of events throughout the incident. Investigate the consequences of the rapid burn that went through the plantations and the subsequent erosion problems. Follow this through to the effect on water catchments and the complications caused to the Canberra water supply cause by erosion, runoff, turbidity and sediment in the water.

Develop an alternative diagram or flow chart showing how the impact of the same event may have been minimised by using traditional Ngunnawal methods of firestick farming for weed control and possible scenarios, had there been diverse natural plantings of vegetation rather than monocultivations.

Support your work with formal referencing and a bibliography.

units of work: later adolescence

Unit Description

The units of work in *Understanding the Land through the Eyes of the Ngunnawal People An Aboriginal Natural Resource Management Program for ACT schools* are designed to develop student understanding of traditional care for country and natural resource management practices of the Ngunnawal people. The Ngunnawal have sustained their way of life over more than twenty-one thousand years. Natural resource management practices are an integral part of Ngunnawal spirituality and culture. Student understanding of the traditional land management practices, and interrelationship between the elements of the natural environment, will lead to both a deeper understanding and appreciation of the Ngunnawal way of life and the need for ongoing natural resource management.

The units of work have been developed in consultation with the Ngunnawal Elders Council and are supported by a DVD. It is intended that teachers delivering the program view the DVD and read the Essential Teacher Understandings before embarking on the unit of study. A student excursion to a significant location on Ngunnawal land is an important part of this unit of work. The Tharwa Sandwash on the Murrumbidgee River, is the location used for the DVD which accompanies this unit of work.

Within a school curriculum Scope and Sequence, it is most likely that students will only once study a unit of work on Aboriginal Natural Resource Management. Therefore, the Big Understandings, Attitudes and Values and Focus Questions are the same for the units in all Bands of Development. The Essential Content and the scope and breadth of student understandings deepen as students' progress from Kindergarten to Year 10.





Band of Development: Later Adolescence

Year level: 10
Key Learning Area: SOSE or Science
Unit duration: Eight to ten weeks

big understandings

Expanded by Band of Development see Attachment 1

1. Value and respect Aboriginal natural resource management practices and knowledge.
2. Ngunnawal country is a traditional definition of territory which has been inhabited for over 21,000 years and is recognised as a meeting place for Aboriginal people from ACT and surrounding regions.
3. Respect of local Ngunnawal people is developed through understanding their traditional knowledge and practices, roles and responsibilities and following their cultural protocols.
4. Land management requires deep knowledge and understanding of the elements of the environment, the land, water, flora and fauna and their interdependence.
5. Aboriginal land management is based on the traditional knowledge and practices built on deep understanding of the relationships between natural systems and cycles within the landscape.
6. Natural resource management is constantly evolving based on increasing scientific understanding of the local environmental system.

attitudes and values

1. Develop curiosity, interest and ownership of the local environment in which students live.
2. Develop a respect for living things and natural systems.
3. Appreciate the intrinsic value of the natural world and the need to preserve the environment and natural heritage for future generations.
4. Develop a sense of optimism for the future by understanding that it is possible to use minimal resources to live comfortably within a specific environment.
5. Value and respect Aboriginal peoples, both past and present, and their cultures and spiritual connections to country.

essential learning achievements

Expanded by Band of Development see Attachment 2

- ELA 2. The student understands and applies the inquiry process
- ELA 19. The student understands and applies scientific knowledge
- ELA 20. The student acts for an environmentally sustainable future
- ELA 21. The student understands about Australia and Australians

focus questions connected to stages of learning sequence

Expanded Stages Of Learning Sequence see Attachment 3

connect

Where is the land area we are talking about?
 Who are the Ngunnawal?

contextualise

What is the importance of the natural resources, land, water, plants and animals, in the environment?

conceptualise

How has the traditional balance of the land been maintained?
 How did the Ngunnawal people use the land?

communicate

What can we learn from the past?

connect

Focus Questions: **Where is the land area we are talking about?**
Who are the Ngunnawal people?

essential content

In the Later Adolescence band of development, students have opportunities to understand and learn about/learn to:

- 2.LA.1** understand the possibility of multiple perspectives and partial explanations of phenomena being investigated
- 2.LA.4** compare and select suitable models or inquiry forms, prepare plans for managing and monitoring investigations
- 20.LA.1** key concepts used in contemporary information and debates about environmental sustainability (e.g. biodiversity, carrying capacity, ecological footprint, preservation, conservation, wilderness, heritage, sustainable development)

assessment tasks

Mapping Ngunnawal country and its relationship to neighbouring tribes. Develop an appropriate tool to demonstrate that Canberra has been a meeting place for more than 20 000 years. Provide evidence to support your claims.

Elaborate on the reasons for the annual migration to Tidbinbilla of the Ngunnawal people and neighbouring tribes. Draw comparisons with the current practice of representatives from all over the country coming to Canberra to meet in Parliament. Construct a tool to show similarities and differences.

Explain the principles of scientific or historical inquiry. Discuss the logistics of accessing reliable evidence and unbiased opinion.

Developing a time line of known factors causing change of lifestyle for the Ngunnawal people from 1700 to 2000.

SOSE teaching and learning	science teaching and learning
<p>Definition of country</p> <p>Construct a map showing the boundaries of the Australian Capital Territory, Ngunnawal land and the areas which are congruent.</p> <p>Draw and label the key geographic features of the land and speculate on their use as a traditional means of travel, transport and communication across the region.</p> <p>Migration routes</p> <p>Map migration routes across Ngunnawal lands. Explain the significance of river corridors, and the place of ceremony, trade relationship building as reasons for the annual movements. Discuss the implications of this practice for spiritual beliefs and natural resource management practices.</p> <p>People</p> <p>Develop a graphic organiser to show the social structure of the Ngunnawal tribe. Include family groups, the six Ngunnawal clans and the five main neighbouring language groups with whom they interacted on an annual basis.</p> <p>Totems</p> <p>Investigate the significance of totems for individuals and for clans. Investigate the responsibilities associated with various totems and how these are connected to management of natural resources and reflected through spiritual beliefs.</p> <p>Construct an illustrated diagram, concept map or flow chart to explain the reasons for choice of totems, possible attributes associated with each and possible implications for natural resource management for the owner of the totem.</p>	<p>Acknowledgement of Country</p> <p>Familiarise students with the Acknowledgement of Country used on formal occasions and at public ceremonies. By asking why we use this acknowledgement, develop the understanding that their home, school and suburb and most of the ACT is in Ngunnawal land.</p> <p>Scientific Inquiry</p> <p>Aboriginal scientific knowledge was based on direct observation of the environment to ensure survival. These skills enabled them to meet their basic needs i.e. food and water, ability to build shelter, safety and responsibility for the group, management of the land and spirituality, connection to country.</p> <p>Use of the senses and retelling of events through narrative and dance were ways of recording data, phenomena and change.</p> <p>Compare the Aboriginal approach of stop, look and learn to education for survival with the scientific inquiry process. Make conclusions about similarities and differences in terms of the need to change and adapt.</p> <p>Scientific explanation</p> <p>Investigate science as a means of explaining phenomena. Show how this has changed over time due to greater contact between cultures, ease of transport and forms of communication. Explore ways in which Aboriginal people have used scientific discovery and application of natural resources to meet their basic needs e.g. tea tree as medicine, rocks as paint, animal grease as barriers to skin infections, woomeras to increase spear throwing distance.</p> <p>Speculation and observation</p> <p>Develop a matrix to show how basic needs may have been met by Ngunnawal people in traditional times and how they are met today by people living in your local suburb.</p> <p>Show consumption of resources, distance from source, storage and preservation.</p> <p>Draw conclusions about impact on the environment in terms of ecological footprint.</p> <p>Support your findings with evidence and references.</p>

contextualise	
Focus Question	What is the importance of the natural resources, land, water, plants and animals, in the environment?
essential content	assessment tasks
<p>In the Later Adolescence band of development, students have opportunities to understand and learn about/learn to:</p> <p>2.LA.8 manage and organise data and information in ways that assist in their interpretation, analysis and synthesis</p> <p>19.LA.5 how people of diverse cultures have contributed to and shaped the development of science</p> <p>19.LA.13 scientific concepts and models to explain the interdependence of populations of organisms and the environment, and to predict the consequences of changes to an ecosystem</p> <p>20.EA.2 events that have different effects on regional or global ecosystems and their related environmental, social or economic consequences</p> <p>21.LA.1 natural and human processes that form and transform Australian environments over time (e.g. explanations of the origins of Australia, factors changing communities, geographical issues affecting Australian environments)</p> <p>21.LA.7 select and apply geographical tools and processes (e.g. maps, graphs, photographs, flow charts, fieldwork, action research) to gather, interpret and present geographical information on Australia</p>	<p>Produce a scientific or historical report on the significance of the Tharwa Sandwash or a similar area.</p> <p>Select a range of strategies, processes and tools for this type of investigation and justify choices.</p> <p>Use evidence to support your conclusions about the current state of the site, extrapolate from this to make assumptions about what the area may have been like two hundred or more years ago. Discuss ongoing care and management implications.</p>

SOSE teaching and learning

Visit the Tharwa Sandwash on the Murrumbidgee River

Develop a report on the geographical and historical significance of the area. Use geographic tools and processes and support any conclusions with evidence.

Speculate on the landforms, terrain and distances involved at the Tharwa Sandwash and over the entirety of Ngunnawal country and environs. Consider the implications for lifestyle, transport and communication of the traditional Ngunnawal people.

Develop a case study or report on the importance of storytelling and dance as a means of communicating travel routes, landmarks and food and water supplies and seasonal variation.

Importance of place

Place, country, identity, time and time management are value laden concepts.

Develop a way of using text and image to show what they may have meant to traditional Ngunnawal people and to the new settlers on Ngunnawal land. Explore these concepts in terms of cultural understandings and the implications for intercultural integration.

Locate, map and speculate on the accuracy of significant sites and locations in Ngunnawal country.

Develop a list of possible sources of information and a grading system to show accuracy and reliability of sources.

science teaching and learning

Visit the Tharwa Sandwash on the Murrumbidgee River

Conduct a scientific investigation of the biodiversity of the area. Use scientific tools and processes and support any conclusions with evidence. Visit the Tharwa Sandwash on the Murrumbidgee River.

Speculate on the implications for the biodiversity and the consequences for change to ecosystems of the area when the river is in a semi dry braided state and when it is in full flood. Use case studies to support your conclusions.

Biodiversity of the area

Develop a web of life diagram and use other scientific tools to describe the vitality of the area in the two states of existence. Use evidence to support your descriptions.

Make predictions about future sudden storm events and the implications for the Sandwash, Murrumbidgee, Lake George and other significant places in Ngunnawal country. Record your predictions and use evidence to substantiate your conclusions.

Evidence of Aboriginal occupation

Conduct research into the archaeological evidence for Aboriginal inhabitants in Ngunnawal land. Consider carbon dating, radioactive dating and other forms of dating places of interest such as Lake George, paintings such as those at Yankee Hat, campfire middens, stone tools and grinding sites, scar trees and other forms of evidence.

Investigate the difficulties of locating evidence and the implications for reliability and accuracy.

Develop a model or annotate an existing scientific report on an investigation of this nature.

Mega fauna

Conduct research into the mega fauna of the south eastern area of Australia. Develop a case study on characteristics and possible cause for extinction of an animal that possibly lived in this area. Discuss this in terms of natural resource management and the implications for future resource management practices.

conceptualise

Focus Questions: How has the traditional balance of the land been maintained?
How did the Ngunnawal people use the land?

essential content

In the Later Adolescence band of development, students have opportunities to understand and learn about/learn to:

- 2.LA.9** routinely evaluate data and information and their sources for accuracy, relevance, reliability, completeness, authenticity and credibility
- 19.LA.2** instances in which progress in science can be affected by and influence social issues and priorities
- 19.LA.3** scientific concepts and models to explain the interdependence of populations of organisms and the environment, and to predict the consequences of changes to an ecosystem
- 20.LA.4** how people's views on the environment influence government and non-government organisations, and the ways in which governments attempt to address issues of development and sustainability
- 20.LA.3** how environmental decision making often involves dealing with conflicting values and interests of different individuals or groups (e.g. preservation of wilderness, development of non-renewable and renewable resources)
- 21.LA.4** the events, people and movements that shaped the development of Australia (e.g. colonisation and expansion, development of governments, participation in major wars) and the contexts in which events and actions occurred (e.g. social and economic context, motivation and beliefs of individuals)
- 21.LA.5** contemporary issues and challenges facing Australian society

assessment tasks

Develop a graphic organiser to demonstrate knowledge of plants and animals of the Ngunnawal country. Clarify those which are native and those which are feral and discuss the impact of each on the locality.

Use evidence to propose plans for commercial utilisation of some forms of flora and fauna and ways of managing feral populations.

Debating the issues of Aboriginal natural resource management as an outmoded method of operation in contrast to chemical and mechanical technological methods. Discuss this from multiple perspectives and use persuasive argument supported by evidence for each of the perspectives.

SOSE teaching and learning	science teaching and learning
<p>Useful plants and animals</p> <p>Develop an illustrated diagram/chart of well known plants and animals of the Ngunnawal country showing their uses prior to 1800 and possible future commercial uses.</p> <p>Provide evidence of Ngunnawal strategies used to manage populations and ensure sustainability of species.</p> <p>Feral and invasive flora and fauna</p> <p>Develop a matrix of feral flora and fauna of Ngunnawal country. From this, choose a manageable number of species, and describe reasons for the introduction of the species, possible reasons for becoming invasive and feral, damage to the environment, eradication methods and rates of success.</p> <p>Wombats and rabbits</p> <p>Develop a comparative study of two animals with some similar characteristics.</p> <p>Compare and contrast the wombats and rabbits in terms of adaptations and predators. Draw some conclusions and speculate on future care and management plans.</p> <p>Flora and fauna population management and control</p> <p>Contrast natural resource management of native species with the difficulties of introducing exotic species into a new environment. Develop a case study and form conclusions for future management of feral populations.</p> <p>Explore Ngunnawal practices for animal population management through personal and clan totems. Describe the implications for natural resource management.</p>	<p>Useful plants and animals</p> <p>Develop an illustrated diagram/chart of well known plants and animals of the Ngunnawal country showing their uses prior to 1800 and possible future commercial uses.</p> <p>Provide evidence of Ngunnawal strategies used to manage populations and ensure sustainability of species.</p> <p>Feral and invasive flora and fauna</p> <p>Develop a matrix of feral flora and fauna of Ngunnawal country. From this, choose a manageable number of species, and describe reasons for the introduction of the species, possible reasons for becoming invasive and feral, damage to the environment, eradication method, and rates of success.</p> <p>Wombats and rabbits</p> <p>Develop a comparative study of two animals with some similar characteristics.</p> <p>Compare and contrast the wombats and rabbits in terms of adaptations and predators. Draw some conclusions and speculate on future care and management plans.</p> <p>Flora and fauna population management and control</p> <p>Contrast natural resource management of native species with the difficulties of introducing exotic species into a new environment. Develop a case study and form conclusions for future management of feral populations.</p> <p>Explore Ngunnawal practices for animal population management through personal and clan totems. Describe the implications for natural resource management.</p>

SOSE teaching and learning	science teaching and learning
<p>Traditional practices</p> <p>Use the story of the Kangaroo and the Grass Parrot personal totems to illustrate traditional land management techniques. Use a case study of the Bogong Moths lifecycle, migration and protein content to illustrate how natural resource management was intertwined with spirituality and care for country.</p> <p>Develop case studies of the need for kangaroo culling as a form of resource management and investigate other possible strategies for management and effective use of resources.</p>	<p>Traditional practices</p> <p>Use the story of the Kangaroo and the Grass Parrot personal totems to illustrate traditional land management techniques. Use a case study of the Bogong Moths lifecycle, migration and protein content to illustrate how natural resource management was intertwined with spirituality and care for country.</p> <p>Methods of Intervention</p> <p>Develop case studies of the need for kangaroo culling as a form of resource management and investigate other possible strategies for management and effective use of resources.</p> <p>Explore the introduction of the rabbit calicivirus disease and biological control.</p>
communicate	
<p>Focus Question: What can we learn from the past?</p>	
essential content	assessment tasks
<p>In the Later Adolescence band of development, students have opportunities to understand and learn about/learn to:</p> <p>2.LA.11 draw conclusions that are consistent with the data or information and provide evidence or supporting details</p> <p>19.LA.19 apply scientific knowledge in exploring and constructing views around ethical and social issues relating to science</p> <p>20.LA.4 how people's views on environment influence government and non-government organisations, and the ways in which governments attempt to address issues of development and sustainability</p> <p>21.EA.8 analyse sources, perspectives, theories and gaps in narrative accounts of Australia and Australians</p>	<p>Describe the importance of storytelling and dance as a means of communicating travel routes, landmarks, food, water supplies and seasonal variation. Discuss this in terms of adaptation to changing situations and in contrast to modern technologies.</p> <p>Use evidence to demonstrate how Aboriginal natural resource management was a successful way of managing flora and fauna populations.</p> <p>Create a game or role play that demonstrates the multiple perspectives of stakeholders and their various management strategies. Use evidence to support the positions.</p>

SOSE teaching and learning

Stakeholders

Develop a list of all community, local and national government and commercial groups that have vested interest in the issues of natural resource management.

Perspectives, incentives and outcomes

Construct some information organiser that crystallises the perspectives, backgrounds and reasons for interest of a range of stakeholders. Address possible benefits for successful management and strategies for achieving outcomes.

Opportunities and strategies for personal action

Construct a flow chart that shows opportunities for affirmative action in local natural resource management as an individual, part of a care group and as a lobbyist. Justify involvement and possible outcomes in all situations.

Engaging in debate

Develop a list of all the stakeholders with a vested interest in the management of an area such as the Tharwa Sandwash. Create a hypothetical issue that would bring stakeholders into conflict and require them to have clearly constructed points of view which are supported by evidence.

Devise a role play or game that would encapsulate all points of view.

science teaching and learning

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Devise a role play or game that would encapsulate all points of view.

big understandings

Interpreted by Band Development Attachment 1

1. Ngunnawal country is a traditional definition of territory which has been inhabited for over 21 000 years and recognised as a meeting place for people from ACT and surrounding regions.

EC: Special places have meaning to people. People look after special places. Make connections between individual's special places and community's special places. People meet in special places for specific purposes.

LC: A significant place is special to a group of people. People meet in special places for specific purposes. Recognise that Ngunnawal and ACT borders are not the same and this region is a local meeting place.

EA: Ngunnawal country is an identifiable space supported by historical evidence. Ngunnawal people met in special places for specific purposes such as discussing land management issues, trading, making laws or conducting ceremonies.

LA: Ngunnawal country is bordered by other language groups. Ngunnawal interacted and traded with these groups. Many Aboriginal language groups had similar cultural practices and beliefs.

2. Respect of local Aboriginal people is developed through understanding their traditional knowledge and practices, roles and responsibilities and following their cultural protocols.

EC: Within a family group, people have specific roles and responsibilities and shared knowledge and history. Respect was the guiding principle for interrelationships between people and between people and their environment.

LC: Within an Aboriginal community, spiritual beliefs and cultural practices determine roles, responsibilities and ownership of special knowledge. These spiritual beliefs and practices are the determinants of the respect that guides relationships between people and people and their environment.

EA: The spiritual beliefs and cultural practices of the Ngunnawal people were reflected in their sense of identity and responsibilities for care of place.

LA: The traditional cultural practices and protocols of the Ngunnawal people were complex and governed interrelationships within the tribe and with other tribes for such things as trade and intermarriage. Cultural practices governed the management of land and natural resources and respect was the guiding principle.

3. Land management requires deep knowledge and understanding of the elements of the environment, the land, water, flora and fauna and their interdependence.

a. EC: Living things depend on their environment and each other. Plants and animals have special characteristics and are adapted to their environment.

- b. LC:** Within a particular habitat, there are specific identifiable characteristics of the land and the plants and animals it contains. Habitats can be similar or significantly different from each other.
- c. EA:** Within Ngunnawal country, there are a range of environments with characteristic elements and interrelationships between natural cycles.
- d. LA:** Traditional land management practices rely on caring for the land and maintaining the balance between populations.

4. Aboriginal land management is based on the traditional knowledge and practices built on deep understanding of the relationships between natural systems and cycles within the landscape.

- EC:** Identify some observable relationships between living things and their environment which were used by the Ngunnawal people.
- LC:** Understand some interactions between living things, and between living things and their environment used by the Ngunnawal people.
- EA:** Traditional land management practices are caring for the land and maintaining the balance between populations. Today these same principles underpin best land management practices
- LA:** Traditional land management practices, such as firestick farming, or selective kangaroo culling, show a deep understanding of the principles of modern science. They are based on a respectful relationship between the people and their environment.

5. Natural resource management is constantly evolving based on increasing scientific understanding of the local environmental system.

- EC:** It is important to conserve resources, care for the environment and participate in positive environmental action.
- LC:** People need to work together as environmental stewards to protect and conserve the environment and effect positive change.
- EA:** Identify land management techniques used by Aboriginal people and specifically analyse those used by Ngunnawal people and their effectiveness in Ngunnawal country.
- LA:** Since 1788 land management practices in Australia have undergone significant change. Many of these practices were imported from Europe and were unsuitable for Australian conditions. In recent time there has been a change back from a reductionist approach to a more holistic systems based approach. This is more in line with the traditional practices of Ngunnawal and other traditional land management practices.

essential learning achievements

Expanded by Band Development Attachment 2

ELA 2: The student understands and applies the enquiry process

early childhood P–2

In the early childhood band of development, students have opportunities to:

- 2.EC.1** explore inquiry as a useful process for creating knowledge and understanding the world around them
- 2.EC.4** make predictions or conjectures related to their everyday experience
- 2.EC.5** make observations about what is happening around them using their senses
- 2.EC.9** follow suggestions to order and present data or information (e.g. grouping or sequencing, drawing, simple table, graph or timeline)
- 2.EC.12** share and communicate observations, findings, ideas and understandings.

later childhood 3–5

In the later childhood band of development, students have opportunities to:

- 2.LC.3** create questions and predictions for investigation
- 2.LC.5** contribute to planning a variety of investigations, recognising where comparisons may be fair and unfair
- 2.LC.7** collect and record data, checking and repeating observations or measurements as needed
- 2.LC.10** conduct searches for information and use a range of sources (e.g. information texts, artefacts, maps, images)
- 2.LC.11** evaluate the accuracy, relevance and credibility of data or information
- 2.LC.13** discuss and compare results with their questions and predictions, and draw conclusions

early adolescence 6–8

In the early adolescence band of development, students have opportunities to:

- 2.EA.3** formulate questions, predictions or propositions suitable for investigation and clarify the inquiry focus
- 2.EA.8** access and interpret a range of primary and/or secondary sources of information (e.g. historical documents, images, oral histories, biographies, articles, media sources, statistical data sets)
- 2.EA.9** evaluate the accuracy, relevance, completeness and credibility of data and information and their sources (e.g. recognise evidence, opinion, bias and perspective; identify credentials of authors or websites)
- 2.EA.12** review their understanding in light of new information
- 2.EA.13** draw reasonable conclusions based on analysis of data and information

later adolescence 9–10

In the later adolescence band of development, students have opportunities to:

- 2.LA.1** understand the possibility of multiple perspectives and partial explanations of phenomena being investigated
- 2.LA.4** compare and select suitable models or inquiry forms, prepare plans for managing and monitoring investigations
- 2.LA.8** manage and organise data and information in ways that assist in their interpretation, analysis and synthesis
- 2.LA.9** routinely evaluate data and information and their sources for accuracy, relevance, reliability, completeness, authenticity and credibility
- 2.LA.11** draw conclusions that are consistent with the data or information and provide evidence or supporting details

ELA 19: The student understands and applies scientific knowledge

early childhood P–2

In the early childhood band of development, students have opportunities to learn about/learn to:

- 19.EC.6** obvious features of a variety of plants and animals
- 19.EC.9** some of the ways in which living things depend on their environment and each other (e.g. basic needs for survival)
- 19.EC.11** some of the ways in which living things depend on the Earth (e.g. soil, water, air) and are affected by its changes.
- 19.EC.15** talk about their investigations and observations.

later childhood 3–5

In the later childhood band of development, students have opportunities to learn about/learn to:

- 19.LC.12** some interactions between living things, and between living things and their environment
- 19.LC.17** observe, explore, investigate, consider, identify, describe, compare and sort natural phenomena and living and non-living things
- 19.LC.18** examine and predict events, speculate about how and why things happen, and compare explanations from different sources, using scientific language

early adolescence 6–8

In the early adolescence band of development, students have opportunities to learn about/learn to:

- 19.EA.3** how scientific understandings have changed over time and that different cultures may have different views in relation to scientific practice (e.g. traditional cultural explanations of phenomena and practices in areas such as medicine)
- 19.EA.12** food chains and webs as models of relationships within living communities
- 19.EA.15** explore, identify and model relationships (e.g. solar system, food chains and webs) to explain interrelationships and predict change
- 19.EA.18** use their scientific understandings to consider and respond to appropriate ethical and social issues relevant to them

later adolescence 9–10

In the later adolescence band of development, students have opportunities to learn about/learn to:

- 19.LA.2** instances in which progress in science can be affected by and influence social issues and priorities
- 19.LA.5** how people of diverse cultures have contributed to and shaped the development of science
- 19.LA.13** scientific concepts and models to explain the interdependence of populations of organisms and the environment, and to predict the consequences of changes to an ecosystem
- 19.LA.19** apply scientific knowledge in exploring and constructing views around ethical and social issues relating to science

ELA 20: The student acts for an environmentally sustainable future

early childhood P–2

In the early childhood band of development, students have opportunities to learn about/learn to:

- 20.EC.1** elements of the natural environment that humans, animals and plants need for survival
- 20.EC.2** different living things in their local environment and some observable relationships between living things and their environment
- 20.EC.3** how people cooperate to care for places in a community.
- 20.EC.5** observe and discuss changes evident in the local environment, both natural (e.g. seasonal changes) and those caused by human action (e.g. changes to the built environment)

later childhood 3–5

In the later childhood band of development, students have opportunities to learn about/learn to:

- 20.LC.1** natural cycles and systems in the environment (e.g. water cycle, food chains)
- 20.LC.2** the concept of habitat and the diversity of living things within a habitat
- 20.LC.3** some effects of human action on natural environments (e.g. land clearing, air and water pollution)
- 20.LC.7** observe and gather data about local environments and changes over time due to human or natural events (e.g. school and grounds, nearby park or creek)

early adolescence 6–8

In the early adolescence band of development, students have opportunities to learn about/learn to:

- 20.EA.1** concepts of interdependence of living things, habitat and ecosystem
- 20.EA.2** some of the processes by which human activities change natural environments in positive and negative ways (e.g. reducing feral animal populations, tourism, deforestation)
- 20.EA.6** conduct case study investigations into local and/ or national ecosystems to identify changes and predict their impacts
- 20.EA.2** events that have different effects on regional or global ecosystems and their related environmental, social or economic consequences

later adolescence 9–10

In the later adolescence band of development, students have opportunities to understand and learn about:

- 20.LA.3** how environmental decision making often involves dealing with conflicting values and interests of different individuals or groups (e.g. preservation of wilderness, development of non-renewable and renewable resources)
- 20.LA.4** how people's views on environment influence government and non-government organisations, and the ways in which governments attempt to address issues of development and sustainability

ELA 21: The student understands about Australia and Australians

early childhood P–2

In the early childhood band of development, students have opportunities to learn about:

- 21.EC.5** Indigenous people as the first Australians and aspects of Australia's history predating British colonisation
- 21.EC.6** individuals and groups in the community (e.g. through simple information texts, family histories, Dreaming stories, folk tales)

later childhood 3–5

In the later childhood band of development, students have opportunities to learn about:

- 21.LC.3** the ways Australia's Indigenous peoples lived prior to colonisation, including distribution across Australia, diversity of cultures, languages, customs, social organisations, technologies and land uses
- 21.LC.6** cultural groups within Australian communities, including some features of their histories, customs and beliefs

early adolescence 6–8

In the early adolescence band of development, students have opportunities to learn about/learn to:

- 21.EA.5** the importance of 'country' to Australia's Aboriginal and Torres Strait Islander peoples (e.g. different ways individuals are related to the land)
- 21.EA.11** find out about, discuss and evaluate historical events using appropriate genres, sources and evidence

later adolescence 9–10

In the later adolescence band of development, students have opportunities to learn about/learn to:

- 21.LA.1** natural and human processes that form and transform Australian environments over time (e.g. explanations of the origins of Australia, factors changing communities, geographical issues affecting Australian environments)
- 21.LA.5** contemporary issues and challenges facing Australian society
- 21.LA.7** select and apply geographical tools and processes (e.g. maps, graphs, photographs, flow charts, fieldwork, action research) to gather, interpret and present geographical information on Australia
- 21.EA.8** analyse sources, perspectives, theories and gaps in narrative accounts of Australia and Australians

stages of learning sequence

Expanded Attachment 3

Stages of Learning Sequences

connect

Students engage with the unit of work. They

- establish the purpose
- identify prior knowledge and beliefs and address misconceptions and
- formulate questions for investigation.

contextualise

The students discover new knowledge. They

- develop skills and learning strategies
- engage in shared learning experiences and
- utilise primary and secondary sources of information.

conceptualise

The students develop understandings, make connections, and apply learning. They

- analyse, synthesise and plan areas for personal, group or whole class investigation
- develop and follow a research plan and
- provide evidence for conclusions.

communicate

Students review and share what they have discovered.

The Four Cs Sequence of Learning model of unit of work writing has been developed by Maureen Bartle, Education Consultant.

references

Australian Alps Liaison Committee, 2005, *Australian Alps Education Kit: Aboriginal people and the Australian Alps*, Australian Alps National Parks.

This information is available to download from
<http://www.australialps.environment.gov.au/learn/aboriginal-people.html>

This booklet looks at the history of Aboriginal people in the Australian Alps from the discoveries of shelters, artefact, culturally marked treed and stone arrangements to documented history of the impact on Aboriginal people as non-Aboriginal people moved into the area. It also explains current practices that ensure traditional owners have access to land and natural resources in the Kosciuszko national Park.

ACT Department of Education, 1990, *From Ochres to Eel Traps: A resource guide for teachers on Aboriginal Science and Technology*, ACT Department of Education, Canberra.

ACT Waterwatch, *Teach the Reach: K-12 Activity and Curriculum Guide*, ACT Waterwatch.

Australian National Botanic Gardens Education Services, 2000, *Aboriginal Plant Use and Technology*, Australian National Botanic Gardens, Canberra.

This information is available to download from
<http://www.anbg.gov.au/education/programs/usingplants.html>

This booklet looks at Aboriginal people's use of plants to make tools and utensils, food sources and medicines.

Australian National Botanic Gardens, 2004, *Aboriginal Plant Use in south-eastern Australia*, Australian National Botanic Gardens, Canberra.

This information is available to download from
<http://www.anbg.gov.au/education/programs/usingplants.html>

This booklet explains a range of common plants found in south eastern Australia, where they are commonly found and what Aboriginal people used them for including food, medicine, tools, utensils, ceremony, hunting and everyday life.

Brown, C., Dickson, D., Halloran, L., Thorpe, B., Monaghan, F., Shea, A., Phillips, S. and Phillips, T., 2007, *Stories of the Ngunnawal*, Journey of Healing (ACT) Inc, Canberra.

This book tells the stories of seven Ngunnawal elders. It is based on their oral histories, they tell the stories of their childhoods and their experiences growing up. Locations include Yass, Namadgi National Park, the Jerrabomberra Wetlands, Black Mountain and the Murrumbidgee River.

references

Barratt, C., 1955, *An Australian Animal Book*, Oxford University Press, Melbourne.

Clyne, D., 1982, *Wildlife in the Suburbs*, Oxford University Press, Melbourne

Clyne, D., 1984, *More Wildlife in the Suburbs*, Angus & Robertson Publishers, Australia.

Elder, B., 2003, *Blood on the Wattle: Massacres and maltreatment of Aboriginal Australians since 1788*, New Holland Publishers, Australia.

Flood, J., 1996, *Moth Hunters of the Australian Capital Territory*, J.M.Flood, Canberra

This book gives accounts of Aboriginal traditional life in the Canberra Region. It includes information including language, social organisation, food sources, customs, clothing, habitation and equipment. It also includes Aboriginal significant sites around the ACT.

Flood, J., 2004, *Archaeology of the Dreamtime: The story of prehistoric Australia and its people*, J.B. Publishing, South Australia.

This book examines the archaeological evidence from stones and bones and as well as Aboriginal oral traditions that have been passed on from generation to generation. It also studies the way in which Australian Aboriginal people have adapted to and modified their environment, how their art and culture developed and has been passed on, and how they have coped with massive changes such as the rising of the seas at the end of the last ice age.

Flood, J., 2006, *The Original Australians: Story of the Aboriginal people*, Allen & Unwin, Crows Nest.

This book tells the story of Australian Aboriginal history and society from traditional life, the effects of colonisation through to modern-day. This story particularly emphasises the resilience and adaptability of Australia's Aboriginal people throughout history especially throughout their relationship with the Europeans who eventually colonised the continent.

Fraser, I. & McJannett, M., 1993, *Wild about Canberra: A field guide to the plants and animals of the ACT*, ACT Parks and Conservation Service, Canberra.

references

Fraser, I. & McJannett, M., 1996, *Neighbours in Trouble: Endangered plant and animals in the ACT*, Conservation Council of the South-East region and Canberra, Canberra.

This book discusses endangered habitats, plants and animals in the ACT. It gives simple descriptions in a readable format, and provides historic and current information on familiar and some lesser known species.

Harrison, M.D., 2009, *My People's Dreaming: An Aboriginal Elder speaks on life, land, spirit and forgiveness*, Finch Publishing: Warriewood NSW

Max Dulumunmun Harrison is an Elder of the Yuin people, who lived throughout the south coast of New South Wales. In his book he reveals the significance of the Creation Dreaming (the story of his people's creation, bush lore, foods, ways of healing, laws, punishment and spirituality. He also details the subtleties and connectedness of his people's relationship to the land, as well as outlining his philosophy of forgiveness.

Hodges, S., 2006, *Hands on History*, Sue Hodges Productions, Melbourne.

This book is a practical guide that includes skills for researching, writing, using objects and understanding and interpreting historic places. It looks at recording history in formats such as publications, oral histories, displays and heritage trails.

Johnstone, L., Skinner, S., Ishiyama, L. & Sharp, S., 2009, *Survey of vegetation and habitat in key riparian zones: Murrumbidgee River*, ACT, Parks Conservation and Lands, Canberra.

Mitchell, B., 2008, *Urban Habitat Guidelines for the ACT*, The Australian National University, Canberra. This guideline is available from website (Habitat Guidelines)

<http://www.lifeinthesuburbs.net.au/>

This guideline provides information to explain urban biodiversity and our role in managing an urban habitat. It explains ecosystems and the importance of their maintenance. It also provides essential steps that could assist in reducing human introduced threats to urban biodiversity as well as a practical guide for developing habitat gardens and landscapes. Throughout the guideline there are many links to other ACT specific information and educational resources.

reference list

Molongolo Catchment Group, 2009, *Glove box guide Frogs of the ACT region*, Molongolo Catchment Group, Canberra.

This guide is available to download (from Freebies and Downloads)
<http://www.molonglocatchment.com.au>

This guide describes the appearance, call, habitat and distribution of selected frogs of the ACT and surrounding areas. It has been designed to allow for easy identification of the frogs in the ACT region.

National Parks Association of the ACT, 2007, *Field Guide to the Native Trees of the ACT*, National Parks Association of the ACT, Canberra.

This guide provides descriptions and illustrations of native trees found in the ACT. The descriptions include where they occur, their form, as well as their leaves, flowers and fruit.

Sveiby, K. & Skuthorpe, T., 2006, *Treading Lightly*, Allen & Unwin, Crows Nest.

This book explores Traditional Aboriginal stories and paintings and how they have been used to pass on knowledge of the environment, law and relationships from generation to generation. It explains the use of story telling as a basis for a sustainable society as well as looking at ecological farming practices. It also explores how the Aboriginal style of leadership created resilient societies. It looks into traditional Aboriginal life and culture and the original model for building sustainable organisations, communities and ecologies.

Taylor, M. & Day, N., 1993, *Field guide to the birds of the ACT*, National Parks Association of the ACT, Canberra

Wheatly, N. & Searle, K., 2007, *Going Bush*, Allen & Unwin, Crows Nest.

This book involves sixteen children from different backgrounds exploring the natural environment, discovering plants and animals, water and soil and rocks. They are encouraged to learn about the harmony between the traditional owners and the land. This Harmony project also encouraged the children to find harmony in friendship and collaboration. This book includes the children's own illustrations and writing linked together with the art and design by Ken Searle and a narrative by Nadia Wheatley.