

Australian Agriculture - an Aboriginal perspective - stage 4 Technology - **Answer Guide**



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Reviewed by the Aboriginal Education Council

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Food and fibre production- An Aboriginal perspective

Sample answers have been provided for learning activities where applicable for this document. The following suggested answers should be used as a guide. It should be noted that these sample answers are suggested answers and not necessarily the very best answer, nor are they the only possible answers.

Worksheet 1- Introduction

1. Word Match

Match the terms with their definitions to complete the table.

Terms		
Flora	Resources	Firestick farming
Enterprise	Fauna	Cultivation
System	Holistic	Sustainability

Term	Definition
Resources	Materials used within a system to produce a product. e.g. soil
Sustainability	Ability of a farm to maintain and improve its environmental resources such as soil and biodiversity and to continue to be profitable
Enterprise	An individual activity on a farm that can produce an income, for example raising beef cattle, growing apple trees for apples
Flora	Plants of a particular region or habitat
Firestick farming	Describes the land management tool carried out by Indigenous Australians, whereby they deliberately burn areas of vegetation
Holistic	Management in <i>agriculture</i> is a systems thinking approach to managing the farm as a whole
Fauna	Animals of a particular region or habitat
System	A set of interacting units that interact and react with the living and nonliving parts of an environment.
Cultivation	Human practice, tilling or breaking up soil to prepare to grow plants

2. **Food and Fibre production is the fundamental aim of farming in Agriculture. Make a list of different food and fibre products farmed in Australia.**
 - Cropping (wheat, cotton, pulses, barley, oilseeds, rice, sugarcane, sorghum) Horticulture (nurseries, turf, grapes, potatoes, tomatoes, berries, nuts)
 - Livestock (cattle- dairy and beef, sheep- meat and wool, poultry, goats, pork)
 - Timber and Forestry
 - Aquaculture
 - Fibres- wool, hair, cotton, hemp
3. **List 2 ways the resources soil and water can be degraded (spoiled).**
 - Desertification- loss of topsoil through erosion when land has no vegetative cover between crops and cultivating/working the soil
 - Soil pollution- from chemicals and fertilisers
 - Eutrophication (fertiliser build up causing algal blooms) and chemical contamination of waterways causing local aquatic life populations to reduce and reduction in biodiversity
 - Acidification- lowering of pH due to natural phenomenon but also through fertiliser use in Ag
 - Salinisation- build-up of salts in the soil profile that reduce plant growth. Can be caused from irrigation or rising water tables
4. **What would happen if the farmer only concentrated on growing a crop but consider the soils and water on their farm**
 The farmer is not carrying out sustainable or holistic farming. Eventually the resources used or depleted in the farm system would have to be managed or replenished for the cropping system to be profitable or become sustainable.

Worksheet 2- Aboriginal Agriculture

1. **How was The Dreaming passed down to successive generations of Aboriginal peoples.**
 The Dreaming knowledge is passed from generation to generation, usually by word of mouth and cultural rituals including art, songs, artefacts, practices and dance between the many cultural groups
2. **Identify what The Dreaming explained and taught the Aboriginal people of Australia**
 The Dreaming is a common belief that explains and rules all the cultural traditions and different spiritual beliefs between all the different Aboriginal regional groups, clans and societies across the continent. Dreaming explained creation and the nature of the world, the place and importance of everyone in the world and the importance of ritual and tradition. The Dreaming also taught people about their country and where water food and shelter were found.
3. **List resources the land provided the Indigenous peoples**
 Food, fibre, shelter, medicines, health care, tools and education
4. **Why is Aboriginal management considered to be holistic?**
 According to The Dreaming and their cultural beliefs the Aboriginal peoples are interconnected with the land. Caring for country is integral to this system. The belief everything and part of their lives and world are interconnected. No one thing is sole from the system. Therefore all their interactions are managed as a whole.
5. **Identify two consequences of no longer using Firestick Farming?**
 Excessive build-up of dry plants which become fire hazards. This can lead to massive fires which can potentially become catastrophic. Also, the open grasslands created from firestick farming encouraged the increase in biodiversity of all species of flora and fauna in the ecosystem, populations of herbivores, marsupials etc. As well many Australian plants require fire to stimulate flowering or seed set and germination. For example scientists believe bilby and many other small animals herbivores became threatened by extinction when Aboriginals stopped firestick farming due to the loss of their habitat and abundant food sources.

6. **Grazing rotation is a farming practice where the farm is divided into multiple paddocks of pasture for livestock to graze (eat). Grazing rotations occur when livestock (sheep, cattle etc.) are moved from paddock to paddock in a sequence after they graze a paddock. Complete the table to contrast five similarities and differences between grazing rotation and firestick farming.**

Reduces weeds	Firestick farming can stimulate
Reduce amounts and build-up of 'trash' or dead plant material which is not nutritious to herbivores and can become a fire hazard	Firestick farming resulted in increased biodiversity of natural habitats.
Creates open grazing lands (plains)	Firestick farming resulted with opportunities to hunt and gather food and fibre.
Produces areas of grassland/pasture with plants growing at different stages	Grazing rotation can result with compaction of soil by cloven hoofed livestock. This means the soil is too compacted for plant roots to establish and develop. If grazing is not managed properly.
Both encourage plant growth (shoots and roots)	If not managed properly, Grazing rotation can result with the death of plants if they are overgrazed to the point that the pastures die and cannot re-establish.

7. **What discoveries have made us understand that Indigenous Australians were not just nomadic (travelling) hunters and gatherers?**
Permanent settlements with established agriculture.
8. **Describe two sustainable agriculture cropping practices used by Aboriginal people.**
- Replacing the yam that was being harvested by replanting the crown of the yam to regrow a replacement plant
 - Only growing species native to the environment that did not require extra resources such as water and nutrients/fertiliser
9. **Describe two sustainable aquaculture practices used by Aboriginal people.**
- Only harvested what they needed. Eggs, plants, birds, insects, fish, frogs, eels, shellfish, molluscs etc. were only harvested when numbers were plentiful. Anything too small was thrown back to breed. The fish traps and eel traps were designed so that only the larger animals were caught and the smaller ones swam through the channels.
 - In times of drought the Aboriginal people's dammed waterways to maintain water for aquatic flora and fauna that otherwise would perish to drought. In doing so they sustained natural ecosystems allowing various marsupials, birds, aquatic plants, insects, and aquatic animals to survive.
10. Investigate "[Rethinking Indigenous Australia's agricultural past](#)". List 5 Australian Aboriginal engineered solutions or products. For each solution explain the problem. The first example has been given for you.

Solution or product	
Budj Bim Eel traps	Eels and fish are needed for food. Eel oil is used as fuel for heating and eel oil is used as an insect repellent.
Wooden and thatched dome houses	Provide shelter for housing and meeting places
Barwon River Fish traps	Catch fish for food gathering
Hollow tree eel smokers	Preserve meat for trade and food when eels are not available
Irrigation channels	Direct and control water flow for fibre and food production, and sustainability of natural ecosystems

Worksheet 3- Farming and living to the calendar

- Watch the clip on "[Aboriginal water values and management in northern Australia](#)" and answer the following questions.
 - List at least 10 of the Bushtucker food products talked about throughout the clip
Fish (Barramundi, Brim), yabbies, freshwater prawns, kangaroo, long necked turtles, berries, seeds, birds, waterlily, lotus lily, water chestnut, bush banana and native peanut, freshwater crocodile eggs, bull sharks, mussels, crab, plums, bulbs, Blackcurrant, White currant, echidna, rock python, magpie goose eggs.
 - Why is water use important to the Aboriginal Peoples
Water is important for Dreaming, food and fibre collection, medicine collection and cultural education for children.
 - What are the CSIRO indigenous seasonal calendars based on
Different language groups based on Aboriginal knowledge of the plants and animals harvested throughout the year. The information was collected to get a better picture of how and seasonally when food is collected throughout the year and how the Aboriginal people read the different signs of animals and plants.
 - Identify one of the seasonal indicators that a food or fibre is ready to be harvested
Answers vary- could include: spear grass, black rock kangaroo, dragonflies, Easterly wind in the Dry season, red kapok flowers, ghost gums bark peeling.
 - Identify the 5 main groups concerned with water usage?
Aboriginal people, recreational fishers, Conservation groups and Famers, Government.
 - If farmers use too much water for irrigation in the dry season, what impact will that have on the Daly River catchment?
The use of too much water for irrigation throughout the dry season, could cause issues with fish population numbers e.g. Black brim and Barramundi.
- Go to CSIRO '[Indigenous seasons calendars](#)'.
Look at the different Aboriginal Language groups Indigenous seasons calendars to complete the following activity.

DESIGN BRIEF: Design your own seasonal calendar for a garden at your school.

Your seasonal calendar must have at least 2 Australian native bush tucker plants and 2 introduced Australian agricultural plants; and At least 2 Australian native fauna and 2 introduced Australian agricultural livestock species.

- Research to choose 2 native species of flora and 2 native fauna species to include in your seasonal calendar.
- Research to choose 2 types of Australian agricultural plants and 2 species of Australian livestock
- Consider the time of season that the food or fibre has to be harvested, joined, sown, watered, fed etc. in the design of your calendar
- Consider and include explanations of the food and/or fibre harvested- when, what and how.
- Use the following template to help with ideas for the seasonal calendar design.

Design solutions will vary

Worksheet 4- Summary

1. Complete the blanks in the Summary
2. Although Aboriginal practices varied between different communities around the continent, there were many similar features including:
 - Aboriginal people lived in **harmony** with the environment
 - They understood the **limitations** of the land and its **resources**
 - **The Dreaming** meant the peoples have a deep religious connection and respect for the land and all the things in it.
 - Population size was based on **food supply**
 - They never **depleted** an area for example- they **replanted** crops and plants from roots and shoots and they never **overhunted** animals
 - They **burned** to promote new growth (firestick farming)
 - They **sustainably** carried out **agriculture** using irrigation, animal management, cultivation and aquaculture
 - Aboriginal people used their great **knowledge of the land** and seasonal calendars to determine what food fibre and medicines they harvested at a point in time.
3. Use your knowledge of sustainable aboriginal agricultural practices, to explain what you could do to increase sustainability for the following farms. The first example has been given for you.
 - **Cattle and Sheep Farm**- divide the farm into many paddocks and make a grazing rotation system to achieve weed free and pastures of different growth stages, similar to what the Aboriginal people achieved through firestick farming. The rotation grazing reduces the amounts of weeds and makes sure that no pasture gets grazed to the point that the plants cant regrow.
 - **Irrigation farm**- Answers could include; making sure that not too much water is utilised from a water source (e.g. aquifer or water system). Thus encouraging a healthy natural ecosystem
 - **Eucalypt Tree Farm (forestry)**- Answers could include; carrying out controlled burn or spraying with herbicide, grazing etc. to reduce dead plant matter and weeds thus reducing chances of catastrophic fires; also to promote tree regrowth
 - **Vegetable farm**- Answers could include; whenever a plant is harvested it is replaced with crowns etc. of the original plant
 - **Fish farm (aquaculture)**- Answers could include; only catching mature or non-breeding stock and allowing small fish etc. to grow out.