AN EDUCATIONAL UNIT FOR JUNIOR PRIMARY SCHOOLS

Farms have distinctive features

YEAR 1

Design and Technologies,
and Geography

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The place for all your primary industry resources
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Contents

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As content of the websites used in this unit is updated or moved, hyperlinks may not always function.

Introduction

Rationale

This resource material aims to help teachers and students in primary schools investigate and understand more about primary industries in Australia.

The objectives of the educational resources are to:

- Support Primary Industries Education Foundation Australia and its members in expanding awareness about primary industries in Australia by engaging and informing teachers and students about the role and importance of primary industries in the Australian economy, environment and wider community.
- Provide resources which help build leadership skills amongst teachers and students in communicating about food and fibre production and primary industries in Australia.
- Develop educational resources that can be used across Australia to provide encouragement, information and practical teaching advice that will support efforts to teach about food and fibre production and the primary industries sector.
- Educate school students on ways food and animals are raised and grown.
- Demonstrate to students that everyone can consider careers in primary industries and along the supply chain of food and fibre products.
- Assist school students to spread this message to their families and the broader community.
- Develop engaging learning programs using an inquiry process aligned with the Australian Curriculum.
- Develop in school communities, an integrated primary industries education program that emphasises the relationship between food and fibre industries, individuals, communities, the environment and our economy.

These educational resources are an effort to provide practical support to teachers and students learning about food and fibre production and primary industries in schools.

An integrated primary industries education program that emphasises the relationship between food and fibre industries, individuals, communities, the environment and our economy.

About the approach

The approach used, is the inquiry approach through five phases: Engage, Explore, Explain, Elaborate and Evaluate.

Several key principles underpin the theoretical and practical application to this unit.

In providing an *integrated framework for inquiry*, complemented by rich explorations of texts that are, in turn, supported by an emphasis on undertaking a challenge or task, the unit requires students to:

- Search for information using both digital and non-digital means
- Use research techniques and strategies
- Use thinking and analysis techniques
- Present findings to a real audience, and
- Reflect both on the product created and the process undertaken.

Rather than seeing knowledge as something that *is taught* the emphasis in this unit is on knowledge and understanding that *is learned*.

The unit involves students in:

- Working from a basis of their prior knowledge and experience
- Seeing a real task or purpose for their learning
- Being directly involved in gathering information firsthand
- Constructing their knowledge in different ways
- Presenting their learning to a real audience
- Reflecting on their learning.

The approach used, is the inquiry approach through five phases: **Engage, Explore, Explain, Elaborate** and **Evaluate**. The phases of the model are based on the 5Es instructional model (Bybee, 1997).

These phases are:

- **Engage:** The 'Engage' phase begins with lessons that mentally engage students with an activity or question. It captures their interest, provides an opportunity for them to express what they know about the concept or skill being developed, and helps them to make connections between what they know and the new ideas.
- **Explore:** The 'Explore' phase includes activities in which they can explore the concept or skill. They grapple with the problem or phenomenon and describe it in their own words. This phase allows students to acquire a common set of experiences that they can use to help each other make sense of the new concept or skill.
- **Explain:** The 'Explain' phase enables students to develop explanations for the phenomenon they have experienced. The significant aspect of this phase is that explanation follows experience.
- **Elaborate:** The 'Elaborate' phase provides opportunities for students to apply what they have learned to new situations and so develop a deeper understanding of the concept or greater use of the skill. It is important for students to discuss and compare their ideas with each other during this phase.
- **Evaluate:** The 'Evaluate' phase provides an opportunity for students to review and reflect on their own learning and new understanding and skills. It is also when students provide evidence for changes to their understanding, beliefs and skills.

Source: Primary Connections *https://www.primaryconnections.org.au/about/teaching*

Teacher notes

Resource description

This resource material aims to help teachers and students in junior primary classes explore the distinctive features of Australian farms and forests as places and the ways Australian farmers living and working on farms are producing food and fibres, for food, clothing and shelter.

Farms have distinctive features develops the concept of place through studies of what farms are like and how their features have changed. Students learn that farms can have natural, managed and constructed environmental features, and range from those that have largely natural features to those with largely managed or constructed features.

The unit develops ideas of active citizenship as students are prompted to further consider how places can be cared for.

The concept of environment is introduced, as students study the natural features of some farms, including how weather patterns and seasons influence these places. Seasonal change as it is perceived by different cultures is also touched on.

The studies of what and forests are like continues with an investigation of some of the important activities located on them, while an examination of where these activities are located, and why, starts students thinking about the concept of space. The idea that people can organise space is introduced by investigating how places are arranged and used for different purposes on farms.

Having explored a variety of places where different foods and fibres are produced, students make a labelled map or model that represents the natural, managed and constructed features of a farm of their choice.

Year level 1

Farms can have natural, managed and constructed environmental features

Curriculum focus

It contains a unit of work in **Geography** and **Design and Technologies** with a variety of student activities selected as vehicles to help students:

- Investigate and explore the distinctive features of Australian and forests as places where people live and work.
- Investigate ways Australian farmers and foresters are producing food and fibres, for food, clothing and shelter.
- Identify and describe the natural, managed and constructed features of places on farms and recognise that spaces can be arranged for different purposes.
- Identify and describe the way the activities located on farms create their distinctive features.
- Select ideas and undertake an inquiry.
- Reflect on the actions farmers and foresters are taking to care for farms and the animals, crops and trees they grow.

Teachers will find, as they examine this unit and its student activities that there are some learning areas which are more strongly represented than others. This is a consequence of the subject matter with which students are dealing. Aboriginal and Torres Strait Islander histories and culture and sustainability are the dominant cross curriculum priorities, and **Geography** and **Design and Technologies** learning areas feature strongly in the unit as the topics deal with food and fibre production, features on farms, characteristics of these features, and how farms are cared for. English and critical and creative thinking are featured strongly throughout the activities.

Australian Curriculum content descriptions

Geography

Year 1

Strand: Geographical Knowledge and Understanding

The natural, managed and constructed features of places, their location, how they change and how they can be cared for ACHGK005

The ways the activities located in a place create its distinctive features ACHGK007

Strand: Geographical Inquiry and Skills: Observing, questioning and planning

Pose questions about familiar and unfamiliar places ACHGS007

Strand: Geographical Inquiry and Skills: Collecting, recording, evaluating and representing

Collect and record geographical data and information, for example, by observing, by interviewing, or from sources such as photographs, plans, satellite images, story books and films ACHGS008

Represent data and the location of places and their features by constructing tables, plans and labelled maps ACHGS009

Strand: Geographical Inquiry and Skills: Communicating

Present findings in a range of communication forms, for example, written, oral, digital and visual, and describe the direction and location of places, using terms such as north, south, opposite, near, far ACHGS011

Strand: Geographical Inquiry and Skills: Reflecting and responding

Reflect on their learning and suggest responses to their findings ACHGS012

Design and Technologies

Foundation – Year 2

Strand: Design and Technologies knowledge and understanding

Explore how plants and animals are grown for food, clothing and shelter and how food is selected and prepared for healthy eating ACTDEK003

Cross Curriculum Priorities

Aboriginal and Torres Strait Islander histories and cultures

OI.2: Aboriginal and Torres Strait Islander communities maintain a special connection to and responsibility for Country/Place throughout all of Australia.

OI.3: Aboriginal and Torres Strait Islander Peoples have unique belief systems and are spiritually connected to the land, sea, sky and waterways.

OI.5: Aboriginal and Torres Strait Islander Peoples' ways of life are uniquely expressed through ways of being, knowing, thinking and doing.

Sustainability

OI.2: All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing and survival.

OI.7: Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments.

Source: Australian Curriculum, Assessment and Reporting Authority (ACARA), downloaded from the Australian Curriculum website in February 2015.

Implementing the unit and activities in the classroom

Using the unit

The unit can be used in a number of ways. It will be of most benefit to teachers who wish to implement a sustained sequence of activities following the inquiry stages identified in the ***About the approach*** section of this unit and content descriptions in the early years in Geography and Design and Technologies as stated in the Australian Curriculum.

Selecting activities

At each stage several activities are suggested from which you are encouraged to select the most appropriate for your purposes. Not all activities in each stage of the unit need to be used. Alternatively, you may add to or complement the suggested activities with ideas of your own.

It is suggested that teachers create a hyperlinked unit. Organise the digital resources for your class's use on a website or wiki or provide them on your interactive whiteboard.

Resourcing the unit

The resources suggested are on the whole, general rather than specific. Schools and the contexts in which they exist vary widely as does the availability of some resources – particularly in remote areas. There is a strong emphasis in the unit on gathering information and data.

Research and observations are encouraged to develop important skills and ensure that the exploration of the topics is grounded in a relevant context.

Some YouTube and online videos in addition to Internet based resources are suggested in the unit. You will need to investigate what is available in your school.

Adapting the unit

The unit is targeted at junior primary students. This is a suggested age range only and teachers are encouraged to modify activities to suit the needs of the students with whom they are working.

The unit's topics are based on content descriptions of the Australian Curriculum and on the key cross curriculum priorities of Aboriginal and Torres Strait Islander histories and culture, and sustainability.

While the suggested content of the unit's topics is of relevance and significance for all students it may need adjustments within the context in which the students are working.

Many of the activities contain the following icons offering a suggestion on how many students should be involved:

 Suggested for individuals

 Suggested for pairs or small groups

 Suggested for larger groups or entire classes

Resource sheets are provided for some activities. Most are for photocopying and distribution to students. They are identified within units in bold italic: ***Resource 1.1***.

The resource sheets are designed to assist teachers to facilitate learning without having to access a range of other resources.

What about assessment?

Rather than being a task carried out at the end of the unit, assessment is viewed as integral to the entire unit sequence. Each activity should be regarded as a context for assessment of student learning.

When planning and implementing the unit of work make clear decisions on what you will focus on in assessing learning. The unit provides an opportunity for a range of skills and understandings to be observed. We encourage you to devise an assessment plan or assessment rubric that features areas to be assessed over subsequent lessons.

In planning for assessment, student learning in the following areas can be considered:

- Understandings about the topic.
- Development of skills.
- Exploration and clarification of values.
- Use of language in relation to content.
- Ability to use and critically analyse a range of texts.
- Ability to analyse and solve problems.
- Ability to interpret information, perceive its meaning and significance, and use it to complete real-world tasks.
- Ability to work cooperatively with others.
- Approach to learning (independence, confidence, participation and enthusiasm).

For this unit, the following understandings are provided to assist teachers in planning for assessment.

Assessment strategies

Each stage in the inquiry sequence provides information about student learning. There are, however, two stages in the unit that are central to assessment: the **Engage** stage and the **Evaluate** stage. Work that is undertaken in these stages can assist teachers to monitor growth and observe concrete examples of the way student ideas have been refined or have changed through the unit sequence. Work samples should be retained for this purpose.

This unit contains a 'Student Task' which is well suited for assessment, as it is the summation of the work undertaken by the students in the unit.

Some questions and possible answers

Should I do all the activities?

At each stage of a unit, a number of activities are listed. You would not be expected to do them all. Instead, the unit is designed so that a selection of activities can be made at each stage. You should select the activities according to the needs and interests of your students and the time, relevance to the existing school curriculum and resources available to you.

While you are encouraged to follow the suggested inquiry sequence for each unit, it is quite possible to pick and choose from the range of activity ideas throughout the unit. It may also be used in conjunction with other programs you use.

How do these units fit into my weekly program?

Although the unit integrates a range of key subject areas, it is not designed to be a total program. It is assumed that regular routines that operate in your classroom will continue to run alongside your unit of work. For example, you may have regular times for use of the library, for maths, physical education etc. These things don't change – although student's writing topics or choice of topics to research in the library or in Information and Communication Technology classes may be influenced by this unit.

How long should the unit run?

This will of course depend on your particular circumstances but generally, a few weeks to a term are suggested.

I don't know much about food and fibre production myself – will I be able to teach it effectively?

Yes! The unit is designed in such a way that you, as the teacher are a co-learner, and you are therefore provided with teacher notes, plus readily available resources that are mainly web-based. Most importantly, you will find that you learn with the students and make discoveries with them.

Fast facts about Australian agriculture

National Farmers' Federation Farm Facts 2012

This page provides basic food and fibre production information that may be helpful when you interact with the school students.

- Agriculture plays a vital role in Australia, contributing to our social, economic and environmental sustainability.
- In 2011, there were 157,000 farmers in Australia. Around half of these were mixed crop and livestock farmers (22 percent), beef cattle farmers (20 percent) or dairy farmers (8 percent).
  Sources: Australian Bureau of Statistics, 2010-11 Agricultural Census; Australian Bureau of Statistics, Australian Social Trends, Australian Farming and Farmers, December 2012, Catalogue No. 4102.0.
- These farmers own or manage Australia's 135,000 farm businesses – 99 percent of which are Australian owned.
  Sources: Australian Bureau of Statistics, 2010–11 Agricultural Census; Australian Bureau of Statistics, Agricultural Land and Water Ownership, December 2010, Catalogue No. 7127.0.

In 2011, there were 157,000 farmers in Australia.

- Each Australian farmer produces enough food to feed 600 people, 150 at home and 450 overseas. Australian farmers produce 93 percent of Australia's daily domestic food supply.
  Sources: Keogh M, Australian Farm Institute, 2009, "Australia's response to world food security concerns", Address to the 1st National Farmers' Federation Annual Congress – Prime Minister's Science, Engineering and Innovation Council (2010); Australia and Food Security in a Changing World. The Prime Minister's Science, Engineering and Innovation Council, Canberra, Australia.
- The average Australian farmer is male (72 percent), 53 years old (compared with 40 years old for people in other occupations), and a self-employed owner manager (56 percent).
  Sources: Australian Bureau of Statistics, 2010–11 Agricultural Census; Australian Bureau of Statistics, Australian Social Trends, Australian Farming and Farmers, December 2012, Catalogue No. 4102.0.
- As of June 2012, there were 290,000 people employed in Australian agriculture. The complete agricultural supply chain, including the affiliated food and fibre industries, provide over 1.6 million jobs to the Australian economy.
  Sources: Australian Bureau of Agricultural & Resource Economics and Sciences (ABARES), Australian Commodity Statistics, 2012; Australia's Farm Dependent Economy: Analysis of the role of Agriculture in the Australian Economy. Modelling undertaken by Econtech.
- The agricultural sector, at farm-gate, contributes 2.4 percent to Australia's total gross domestic product. The gross value of Australian farm production in 2011–12 was $46.7 billion.
  Sources: Australian Bureau of Statistics, Value of Agricultural Commodities Produced, 2011–12, Catalogue No. 7503.0; Australian Bureau of Statistics, 2010–11, Australian System of National Accounts, Catalogue No. 5204.0; ABARES, Australian Commodity Statistics, 2012.

The gross value of Australian farm production in 2011–12 was $46.7 billion.

- Australian farmers are environmental stewards, owning, managing and caring for 59 percent of Australia's land mass.
  Sources: Australian Government Department of Agriculture, Fisheries and Forestry, At a Glance, 2012.
- Farmers are at the frontline of delivering environmental outcomes on behalf of the Australian community, with 94 percent of Australian farmers actively undertaking natural resource management.
  Source: Australian Bureau of Statistics, Natural Resource Management on Australian Farms 2006–07.
- Australia's primary industries have led the nation in reducing greenhouse gas emissions: a massive 40 percent reduction between 1990 and 2006.
  Source: Australian Government Department of Climate Change, National Inventory by Economic Sector 2006.

Source: National Farmers' Federation Farm Facts 2012 at http://www.nff.org.au/farm-facts.html

Meat and Livestock Industry

- Australia's national cattle herd stands at 28.5 million head with the beef industry accounting for 57 percent of all farms with agricultural activity.
- Australia produced around 2.2 million tonnes of beef and veal in 2012–13 directly contributing to 1 percent of Australia's gross domestic product.
- Australia's national sheep flock is 74.7 million head with the sheep industry accounting for 32 percent of all farms with agricultural activity.
- Australia produces approximately 6 percent of the world's lamb and mutton supply and in 2012–13 exported 51 percent of all lamb and 96 percent of all mutton produced.
- Australia's beef and lamb industry employs approximately 200,000 workers across farm, processing and retail.
- Australian cattle and sheep farmers are the custodians of almost half of Australia's land.
- Australia's beef and lamb industry is committed to ensuring a sustainable food supply for future generations with ongoing research and development projects relating to water, soil, biodiversity, animal welfare, energy, emissions and more.

Source: Meat and Livestock Australia http://mla.com.au

Fishing and Aquaculture Industry

Australia's marine domain, our Exclusive Economic Zone, is one of the largest in the world, covering around 10 million square kilometres. This is larger than mainland Australia (7.69 million square kilometres). Despite the size of this zone Australia ranks 46th in the world for seafood production.

Australia has progressively adopted a more ecosystem-based approach to fisheries management which looks at the effect of fishing practices not just on the target species, but also on the environment and other related species. Fisheries managers monitor both stock and fishing levels as well as a range of other environmental factors to ensure the amount of seafood harvested every year does not deplete stocks. In addition, government observers travel regularly on fishing boats to ensure compliance to quotas, bycatch limits and other regulations.

Source: Fisheries Research and Development Corporation, 2013 http://frdc.com.au/

Australia's marine domain covers around 10 million square kilometres.

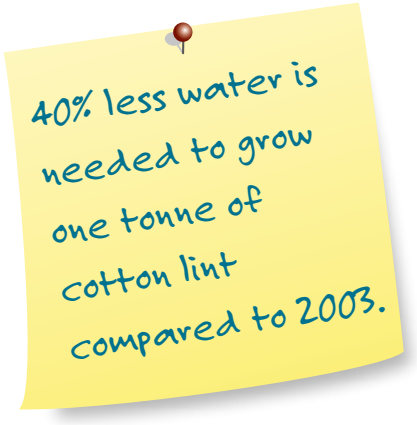
During 2011–12 in Australia:

- There were 6,991 people directly employed in the commercial fishing, hunting and trapping sector, and 3,642 in aquaculture enterprises.
- The sector comprises approximately 120 wild catch fisheries and 70 aquaculture species.
- The gross value of Australian commercial seafood and products (e.g. pearls) was valued at $2.3 billion, an increase of 3 percent on the previous year.
- Australian imports of fisheries products increased by 5 percent.
- The value of production for the wild-catch sector declined by 1 percent to $1.3 billion and production volume decreased by 4 percent to 157,505 tonnes. While the gross value of aquaculture production rose by 10 percent ($100 million) to $1.1 billion.
- The largest contributor to Australian aquaculture production in 2011–12 was salmonids, which make up 52 percent of the total aquaculture production volume and 49 percent of the value.
- Tasmania accounted for the largest share of gross value of production (30 percent), followed by South Australia (19 percent) and Western Australia (17 percent). Commonwealth fisheries accounted for 13 percent of the gross value of production.

Source: ABARES, 2013 http://data.daff.gov.au/data/warehouse/9aam/afstad9aamd003/2012/AustFishStats_2012_v1.0.0.pdf

Cotton Industry

- Every year cotton farmers make an important social and economic contribution to the nation creating jobs for 8,000 people (in Northern New South Wales and Southern Queensland alone), support for more than 4,000 businesses and over $2 billion for the national economy in export earnings.
  Sources: Cotton Australia Pocket Guide to Cotton, Judith Stubbs and Associates Report 2011.
- In 2013, there were 1,181 cotton farms. 63 percent were in New South Wales and 37 percent were in Queensland. Of those farms cotton makes up 17 percent of land area on farm.
  Source: Cotton Annual 2014
- Australia's cotton growers produce enough cotton to provide jeans, socks, underwear and a shirt for 450 million people. The overall yield in 2012 was 10.37 bales per hectare – the first time in history that average yields have exceeded 10 bales per hectare. Australia's cotton growers produce yields almost three times the world average.
  Sources: Cotton Australia tables (compilation of industry sources), ABARES Crop Report, December 2012, Pocket Guide to Cotton 2014.
- The average Australian cotton farmer is 39 years old, has a family owned and operated farm, employs on average six or more people, grows other crops like sorghum, soybeans, wheat and canola, has 496 hectares of cotton and is not only a farmer but also a builder, mechanic meteorologist, agronomist, conservationist, scientist and marketer.
  Sources: Pocket Guide to Cotton 2014, Monsanto audited numbers 20.12.13, 2013 Cotton Practices Grower Survey, Cotton Research and Development Corporation.
- The Australian cotton crop was worth almost $2.3 billion at the farm gate.
  Source: Cotton Australia tables (compilation of industry sources), Cotton Compass.
- The Australian cotton industry has achieved a 40 percent increase in water productivity over the last decade i.e. 40 percent less water is now needed to grow one tonne of cotton lint, compared to 2003.
  Source: The Australian Cotton Water Story 2011.



- The ratio of dryland cotton (rain grown) to irrigated cotton varies depending on the market and conditions. Of the 2011–12 crop 5 percent was dryland and 95 percent irrigated. Favourable grain and sorghum prices meant many dryland farmers opted not to plant cotton at that time.
  Sources: Cotton Australia tables (compilation of industry sources), ABARES Crop Report December 2012.
- Australian cotton growers have reduced their insecticide use by 95 percent over the past 15 years. *Source: Monsanto Audited numbers 20.12.2013.*
- Cotton growers are good environmental stewards, owning and caring for native vegetation equivalent to 40 percent of the area of their cotton farms, on average.
  Source: 2011 Cotton Grower Survey (Cotton Research and Development Corporation and Cotton Catchment Communities Co-operative Research Centre).

Source: Cotton Australia http://www.cottonaustralia.com.au

Pork Industry

- Australia is the first nation in the world to introduce the voluntary phase-out of gestation stalls.
- Pork accounts for approximately 0.4 percent of the national greenhouse gas emissions – significantly lower than other agricultural sectors, including beef at 11.2 percent, sheep at 3.4 percent, and cattle at 2.7 percent.

  Source: Garnaut, R 2008, The Garnaut climate change review – final report, available at: http://www.garnautreview.org.au/index.htm
- Whether housed indoors or outdoors, a pig spends more time resting than any other domestic animal.
- Australia's pig herd health is one of the cleanest in the world, free from many detrimental diseases found in most other pig producing countries
- The feed component (mainly grains such as wheat, barley and sorghum) makes up about 60 percent of the total cost of producing pork.
- Pigs have a very wide angle of vision (310 degrees) and are therefore easily distracted.
- On average, a sow will produce 10–12 piglets per litter.
- The average growth rate of Australian pigs is around 600–650 grams a day from birth to sale.
- Pigs have colour vision but they can't focus both eyes on the same spot.
- Pigs are unable to perspire and they lose heat through their mouths. Their ideal growing temperature is 20–22˚C.

Source: Australian Pork Limited http://www.australianpork.com.au

Forestry Industry

- Forestry plays a vital role in Australia, contributing to our social, economic and environmental sustainability.
- Forests are also the foundation for a broad range of cultural and spiritual experiences for diverse groups of people. They are a major tourist attraction for Australian and overseas visitors, providing for a vast array of recreational and educational activities.
- In 2010–11, the total turnover of Australia's forest product industries was more than $24 billion.
- Australia has 125 million hectares of forest, equivalent to 16 percent of Australia's land area. Australia has about 3 percent of the world's forest area, and the seventh largest reported forest area of any country worldwide.
- Australia's 123 million hectares of native forests are dominated by eucalypt forests and acacia forests.
- 32 percent of all Australia's native forests (private and public land) are protected for biodiversity conservation. With 73 percent of Australia's identified old growth forests in formal or informal nature conservation reserves.
- 9 percent (36.6 million hectares) of the native forests were available and suitable for commercial wood production in 2010–11 comprising 7.5 million hectares of multiple-use public forests and 29.1 million hectares of leasehold and private forests.
- Forests protect soil and water resources and are increasingly being recognised for their carbon storage and sequestration capability. The total carbon stored in forests, wood and wood products and paper products was in the order of 400 million tonnes in 2010.
- Australia's native and plantation forests provide the majority of the timber and a significant proportion of the paper products used by Australians.

- On average, each year, every Australian consumes the equivalent of about 1 cubic metre of harvested log in the form of timber products, including timber for home building, joinery and furniture and paper products.
- Australia's forest management is among the best in the world in terms of conservation reserves and codes of practice for production forests.
- Australia has two forestry certification schemes that enable users of wood and wooden products to know the source of the wood.
- The sector directly employs 73,267 people in the forest and wood products industry in Australia (2011). This includes full and part time employees with 1.5 percent of all employees being Indigenous.

Sources: http://www.agriculture.gov.au/forestry
http://au.fsc.org/
http://www.forestrystandard.org.au/
http://www.naturallybetter.com.au/
http://www.forestlearning.edu.au/

Step 1: Engage with the topic

Getting started

Purpose

To provide students with opportunities to:

- develop understandings of place through studies of what farms and forests are like
- gather information about their prior knowledge of farms and forests
- be introduced to the terms natural, managed and constructed environmental features
- pool ideas and share with others
- organise the ideas they have about farms and forests as places
- set directions for an investigation.

Farms and forests as places

Young children have probably read a book about a farm or forests, seen a photo or maybe even visited one.

TALK with students about farms and forests. Who might go past a farm or a forest on the way home? Who has a family member who lives on a farm or near a forest? Is it a sheep farm, a cattle farm, a pig farm, a wheat farm, a cotton farm, a fish farm, a plantation or forest, a chicken farm or another type of farm?

TALK about farms and forests as places and where they might be found.

ASK questions like:

- Where can farms and forests be found?
- Are farms and forests found in cities?
- Are farms and forests found in towns?
- Might farms and forests be found on the coast?
- Can farms and forests be found in deserts?
- Can farms and forests be found on islands?
- Can farms and forests be found near rivers, creeks and streams?
- Might there be a type of farm found in the sea or a forest?

FIND a story about a farm or forest. There are a number of student written and illustrated picture books which could be used as springboards to **EXPLORE** aspects of farms, forests and their features.

See: Envirostories. *Our Farmers, Our Future Books*
http://www.envirostories.com.au/stories/story-books/2012books-1/

Finding out what students already know

Talk with students about what they know about farms and forests. **LIST** all ideas and **DISPLAY** these.

Ask students to **TELL** **WRITE** or **DRAW** their ideas about farms and forests. Present ideas to one another.

Engaging with natural, managed and constructed features of places

Define natural, managed and constructed environmental features of places. **BRAINSTORM** a range of known natural places. For example: bush, beach, cliffs, creek, field, forest, hill, island, lake, mangrove, mountain, stream, pond, river, sea, valley, waterfall, desert, rainforest, and volcano.

Introduce these terms as geographical language. Undertake a similar **BRAINSTORM** of known constructed places (for example: house, garage, church, mosque, temple, shopping centre, cinema, factory, hotel, office, theatre, library, shop).

Introduce these terms as geographical language. Undertake a similar **BRAINSTORM** of known managed places (for example: suburb, city, airport, farms, plantations, harbours, railways, pipelines, dams, reservoirs, roads, streets, canals).

Introduce images of places and/or picture maps that have both natural and built features within them (for example: farms, playgrounds, parks, schools, forests, botanical gardens, zoos etc. In pairs, ask students to **VIEW** a range of images and sort and classify the natural, managed and constructed features of the places).

Places where people grow food and fibres

Ask students to **TALK** about the places where foods like meat, vegetables, wheat, fish, fruits, eggs, nuts, seafood, and milk are grown and then share this with a partner. As a class, **LIST** all the different types of foods suggested by students and their ideas about where or what places they are grown.

Ask students to **SHARE** the places where they think fibres like cotton, wood and wool are grown?

RECORD all ideas.

Setting the task

Note: This is a suggested assessment task.

Explain to the class that they will be using a range of activities and resources to develop an understanding of 'natural, managed and constructed environmental features' of farms. They will **CONSIDER** how farmers and foresters manage features of their farms and forests to care for these places and how spaces within a farm can be rearranged to suit different purposes. They will then **DEVELOP** a 'big idea' about places where Australian farmers and foresters are producing food and fibres, for food, clothing and shelter, and **MAKE** a labelled map or model that represents the natural, managed and constructed features of a farm of their choice.

Consider how farmers and foresters manage features of their farms and forests to care for these places, and how spaces within a farm can be rearranged to suit different purposes.

Step 2: Explore features of places that produce food and fibre

Purpose

To provide students with opportunities to develop their understanding of:

- farms having natural, managed and constructed environmental features, and how they can range from those that have largely natural features to those with largely managed or constructed features
- a variety of places where people grow food and fibre
- where food and fibre are farmed or grown
- geographical language used to describe features of places
- features of places that grow food and fibre
- a focus for the forthcoming experiences in the 'Explain' stage of the inquiry.

Visit farms

Where possible, **COORDINATE** a visit to local farm to directly find out more about the places on the farm or forest, what is grown, the running of the farm or forest, and the way the farm or forest is cared for. If interested contact the Primary Industries Education Foundation Australia for names of farms to visit and contact details, email info@primaryindustrieseducation.com.au

Alternatively, where possible **ARRANGE** a Skype session or video conference with a farmer.

Features of places

Introduce students to a range of dairy farms in Australia where people raise cows and produce milk.

VIEW images about dairy farming in Australia at:
http://www.dairy.edu.au/discoverdairy/topics/farm-life/dairy-farming-in-australia

- **TALK** about the characteristics of each dairy farm pictured as a place.
- **DRAW** some of the places where people raise dairy cows and produce milk.
- **SCRIBE** or **WRITE** accompanying captions about dairy farms, their natural, managed and constructed features.
- **DISPLAY** in an interest centre entitled 'Distinctive features of dairy farms'.

Features of farms

Note: This is the assessment task.

RE-STATE to the class that they will be using a range of activities and resources to develop an understanding of 'natural, managed and constructed environmental features' of farms. They will **CONSIDER** how farmers and foresters manage features of their farms to care for these places and how spaces within a farm can be rearranged to suit different purposes.

They will then **DEVELOP** a 'big idea' about places where Australian farmers are producing food and fibres, for food, clothing and shelter, and **MAKE** a labelled map or model that represents the natural, managed and constructed features of a farm of their choice.

Introduce geographical language

TALK with students about geographers and how they study the Earth's surface as the space in which people live.

Let them know that geographers ask questions about places, like:

- Where is it?
- What is it like?
- Why is it there?
- When did it happen?
- Who is involved?
- What impact does it have?
- How should it be altered or managed?

TALK about the language they use. Introduce terms about features of places like:

Natural features: soil, water, trees, bushes, grasses, air, lake, river, stream.

Managed features: channel, gates, fences, watering systems, feeding systems, paddocks, reservoir, irrigation channel.

Built or constructed features: A water tank, wind mill, shed, trough, dog kennel, fence, gate.

Focus on the illustrated farms including a piggery, cotton farm, cattle and sheep farm, salmon farm and forest

Using the first illustration of a farm located in ***Resource 1.1*** ask students to **FIND** natural features within it (trees, soil, grass, water, air). Repeat this with the remaining four farms.

CREATE a class word bank of words collected.

The natural features in the piggery include...

The natural features of the cotton farm include...

The natural features of the cattle and sheep farm are...

The natural features in the salmon farm are...

The natural features in the plantation and native forest include...

REPEAT the activity above for the managed and constructed features found on each farm.

SUMMARISE the information gathered about the natural, managed and constructed features found onto a large chart. Horizontal headings could include: Piggery, Cattle and Sheep Farm, Cotton Farm, Salmon Farm and Plantation and Native Forest; vertical categories might include natural features, managed features and constructed features.

Find out about the places on a farm or forest, what is grown, the running of the farm or forest, and the way the farm or forest is cared for.

Step 3: Explain how to care for different features of places

Purpose

To provide students with opportunities to:

- consider how weather and season patterns impact on features of farms
- understand more about farms where the weather patterns can be an issue that involve changing the ways things are done
- understand more about how farmers manage features of their farms to care for these places
- explore how spaces within farms can be rearranged to suit different purposes
- be introduced to maps
- make a collaborative map.

Weather and seasonal changes require farmers to take action for their farms and seek solutions that involve managing natural features better.

Caring for places

A number of the Envirostories provide insights into ways weather and seasonal changes require farmers to take action for their farms and seek solutions that involve managing natural features better.

READ stories like:

A Great Turnaround
http://www.envirostories.com.au/es2012/es2012_CRC_Turnaround/index.html

Droughts and Flooding Rains
http://www.envirostories.com.au/es2012/es2012_CRC_DroughtsFloods/index.html

DISCUSS the story's setting, characters, environment, and the issues they face and solve together. Use ***Resource 1.2*** to draw or write about these aspects of the story.

READ more Envirostories that show how farmers care for their water and soils.

READ *'Cotton on Koramba'* and *'Our Farms are Our Future'.*
http://www.envirostories.com.au/es2012/es2012_CRC_Koramba/index.html
http://www.envirostories.com.au/es2012/es2012_BRG_OFOF/index.html

DISCUSS the story's setting, characters, environment, and the issues they face and solve together. Use ***Resource 1.2*** to draw or write about these aspects of the story.

Use an Aboriginal perspective

DISCUSS how Aboriginal Dreaming stories and Torres Strait Islander People's Tagai stories provide explanations for distinctive features of places and their ongoing spiritual connections with their cultures.

As a class, **READ** the story of the Ngunnawal Peoples, and the special places that provided them with food and fibre in times of changing weather and seasonal patterns.
http://www.tams.act.gov.au/__data/assets/pdf_file/0004/396904/Aboriginal_Cultural_Heritage_of_the_ACT.pdf

Introduce students to seasonal calendars used by Indigenous Peoples.
http://www.bom.gov.au/iwk/

SEARCH Google Images for calendars used by Indigenous Peoples in Australia: https://www.google.com/imghp

Use a Torres Strait Islander perspective

FIND OUT about Phil Wallis, a Traditional owner, and the natural place that is important to him and his people and the ways it can be cared for.
https://www.youtube.com/watch?v=rmttpaH5IR4&list=UUnoxDA5iji0limevCrfQVSA&index=19

Introducing maps

TALK with the students about the need to be a bit of a detective when finding places on a map, as maps give lots of clues. As a class, use Google Maps to **LOCATE** where the school is. Ask students to **OBSERVE** the streets travelled to get to school and to **DRAW** a map of the route taken.

TALK with students about maps being a special drawing showing part of the Earth's surface on a page, and how colours are used to show things that are found on the Earth's surface. Explain also that not all things can be shown on a map.

LOOK at large street directory maps, globes, large board atlases, or Google Maps and ask students to:

- **IDENTIFY** places they see (for example: land masses, oceans, islands, streets).Invite each student to make a statement about what they can see on the map or globe, for example: land masses, the equator, the North Pole, oceans and names of countries.
- **IDENTIFY** those things you cannot see on the map or globe, for instance people, houses, trees.

Using the map or globe, introduce and **IDENTIFY** places like North and South Pole, the equator, and introduce terms north, south, east and west instead of up, down, below and above.

COLLECT together an assortment of objects and spread them out on a table or on a sheet of paper on the floor. Ask students in groups to:

- **STAND** so that they can look down at them and to **DRAW** a map of what they see.
- Include a 'key' on their map with symbols that **DESCRIBE** the objects included on the map.
- Use colours and symbols to **REPRESENT** the different objects.

Ask students in pairs or small groups to **REVISIT** their map of the route they take to their house and add symbols to **SHOW** features of places these pass. For example -!-!-!-! for a railway track. As a class, **SHARE** maps and chart symbols used by the students. **DISPLAY** these for reference.

MAKE a class directory or dictionary of the mapping symbols.

Map and model making

Note: This is a suggested assessment activity.

Invite students to begin **DRAWING** a map or **CREATING** a model of a farm that grows food or fibre and its surroundings and **LABEL** the natural, managed and constructed features they recall in and around the farm and how farmers manage features of their farms to care for these places.

Encourage students to include a compass on their map or model showing directions including north, south, east and west.

Ask students to also include a key on their map or model. The key should be added to the students' maps or models with symbols to **EXPLAIN** the features included on the map or model.

Draw a map or create a model of a farm that grows food or fibre and its surroundings, and label the natural, managed and constructed features they recall.

Step 4: Elaborate on concepts and ideas

Purpose

To provide students with opportunities to:

- learn about how farmers manage features of their farms to care for these places
- investigate important activities that happen on farms
- explore places and how they are arranged and used
- apply what they have learned
- share investigation findings.

Talk about the need to provide food, water, shelter, clean air and space for animals, and how crops need water, good soil and sunlight and to be free of weeds and pests to grow.

Caring for places

TALK with the class about how farms are cared for by farmers.

BRAINSTORM ideas about how farmers might care for the animals and crops they grow.

TALK about the need to provide food, water, shelter, clean air and space for animals to grow.

DISCUSS how crops need water, good soil and sunlight and to be free of weeds and pests to grow.

Review the illustrations in ***Resource 1.1*** and ask students to **IDENTIFY** ways the pigs in the piggery are being cared for.

ASK questions like:

- Can you locate things that the pigs need to be healthy? (for example: feed, water, shelter, space, and clean air)

Reflect on the cattle and sheep farm and ask students to **LOCATE** images that identify how these animals are cared for.

Look at the salmon farm and ask students to **IDENTIFY** ways farmers are caring for the salmon farmed there.

Reflect on the cotton farm and ask students to **DESCRIBE** ways the cotton being grown might be cared for.

Add to the labelled maps or models

Note: This is an assessment activity

Invite students to add information to their map or model about ways farmers care about their animals and crops and their land and water.

Activities on the farm

Revisit the information about the five farms in ***Resource 1.1*** and how the features of these places are used.

Using the illustration of the plantation and native forest ask students to **MAKE** two maps that represent both forested areas and use symbols to signify uses of different areas and objects. For example P = Play; W = Work; H = homes for animals; T = timber.

If time permits, **REPEAT** this activity with the other farm types represented in ***Resource 1.1***.

DISPLAY maps in an interest centre entitled 'Maps to show features of places'.

Exploring places and how they are arranged and used

TALK with the class about what they did on the weekend or afternoon before and where this took place. For example: I went to soccer practice at the soccer field; I celebrated my Nan's birthday at her house; My family shared dinner in the dining room; I played a game of cricket in the backyard; I helped cook dinner in the kitchen.

RECORD places and how they are used. This can be done pictorially or in writing.

Encourage students in pairs or small groups to **TALK** about choices their family members make about using different areas in and around their home. **SHARE** responses and **RECORD** findings on a large outline of a home and add written captions.

Revisit the learning objects in ***Resource 1.1*** and **INVESTIGATE** how the farmers use places in and around the farm, how they are arranged and the features of these places.

DISCUSS what information is presented in the illustration of the cattle and sheep farm. Focus on the paddocks and talk about how these places are arranged and used.

View the salmon farm and **DISCUSS** how the salmon farm is arranged and used.

View other illustrations in ***Resource 1.1*** for the students to **IDENTIFY** how these places are arranged and how farmers might use different places and the objects within them.

Debrief

As a class, **DISCUSS** what students have learned about places like farms; ways farmers care for these places and how different places on farms are arranged and used.

Discuss what students have learned about places like farms; ways farmers care for these places and how different places on farms are arranged and used.

Involve others in your school community

Invite parents and caregivers to come and **LEARN** about the distinctive features farms have.

SET UP a display showcasing the student made maps and models of farms.

DECIDE on ways to educate families about farms and their distinctive features, for example: through a classroom display of the student's maps and models, report at the school assembly, photos and an article in the school newsletter or entries and photos on the school's blog.

Think back and evaluate

Purpose

To provide students with opportunities to:

- reflect on their own learning.

To provide teachers with:

- insights into students' understandings developed in this unit.

Reflection

Begin by modelling reflective thinking, drawing and/or writing through a whole class learning log. Alternatively, you could **MODEL** your own entry – 'thinking aloud' – as you write.

PROVIDE students with a set of focus questions for their reflections:

- **DRAW** about something new that you learned in this unit in relation to places that grow food and fibre.
- **TELL** me about how farmers use places and the features of these places.
- **TALK** to me about ways farmers care for their farms.

References

Australian Academy of Science (2005) *Primary Connections*, Canberra, Australia.
Cecil, N. (1995) *The Art of Inquiry: questioning strategies for K-6 classrooms*, Peguis, Canada.
Crockett, L., Jukes, I. & Churches, A. (2011) *Literacy is not enough. 21st Century Fluencies for the Digital Age.* 21st Century Fluency Project Inc.
De Bono, E. (1992) *Six Thinking Hats for Schools*, Books 1 & 2, Hawker Brownlow Educational.
Gardner, H. (1985) *Frames of Mind: the theory of multiple intelligences,* Basic Books, New York.
Hamston, J. and Murdock, K. (1996) *Integrating Socially: units of work for social education*, Eleanor Curtain, Melbourne.
Hill, S. and Hill, T. (1990) *The Collaborative Classroom*, Eleanor Curtin, Melbourne.
Wilks, S. (1992) *Critical and Creative Thinking: strategies for classroom enquiry*, Eleanor Curtin, Melbourne.

Websites (viewed February 2015)

This is a list of websites used in this unit for teacher use. As content of the websites used in this unit is updated or moved, hyperlinks may not always function.

Australian Capital Territory Government. Territory and Municipal Services - Ngunnawal Country
http://www.tams.act.gov.au/__data/assets/pdf_file/0004/396904/Aboriginal_Cultural_Heritage_of_the_ACT.pdf

Australian Curriculum, Assessment and Reporting Authority. Australian Curriculum
http://www.australiancurriculum.edu.au

Australian Forestry Standard
http://www.forestrystandard.org.au

Australian Government Bureau of Meteorology. Indigenous Weather Knowledge
http://www.bom.gov.au/iwk/

Australian Government Department of Agriculture
http://www.agriculture.gov.au/forestry

Australian Fisheries Statistics 2012 http://data.daff.gov.au/data/warehouse/9aam/afstad9aamd003/2012/AustFishStats_2012_v1.0.0.pdf

Australian Pork Limited
http://www.australianpork.com.au

Cotton Australia
http://cottonaustralia.com.au/

Creative Commons
http://creativecommons.org/licenses/by-nc-sa/3.0/au/

Discover Dairy: Dairy Farming in Australia
http://www.dairy.edu.au/discoverdairy/topics/farm-life/dairy-farming-in-australia

Envirostories:
Our farmers, our future books http://www.envirostories.com.au/stories/story-books/2012books-1/
A great turnaround http://www.envirostories.com.au/es2012/es2012_CRC_Turnaround/index.html
Droughts and flooding rains http://www.envirostories.com.au/es2012/es2012_CRC_DroughtsFloods/index.html
Cotton on 'Koramba' http://www.envirostories.com.au/es2012/es2012_CRC_Koramba/index.html
Our farms are our future http://www.envirostories.com.au/es2012/es2012_BRG_OFOF/index.html

Fisheries Research Development Corporation
http://frdc.com.au/

Forest Learning
http://forestlearning.edu.au

Forest Stewardship Council Australia
http://au.fsc.org/

Garnaut climate change review – final report
http://www.garnautreview.org.au/index.htm

Google Images
https://www.google.com/imghp

Meat & Livestock Australia
http://mla.com.au

National Farmers' Federation. Farm Facts 2012
http://www.nff.org.au/farm-facts.html

Primary Connections
https://www.primaryconnections.org.au/about/teaching

Wood Naturally Better
http://www.naturallybetter.com.au/

YouTube video:
Great Barrier Reef Marine Park - Phil Wallis, Traditional Owner https://www.youtube.com/watch?v=rmttpaH5IR4&list=UUnoxDA5iji0limevCrfQVSA&index=19

Resource 1.1

Explore a piggery

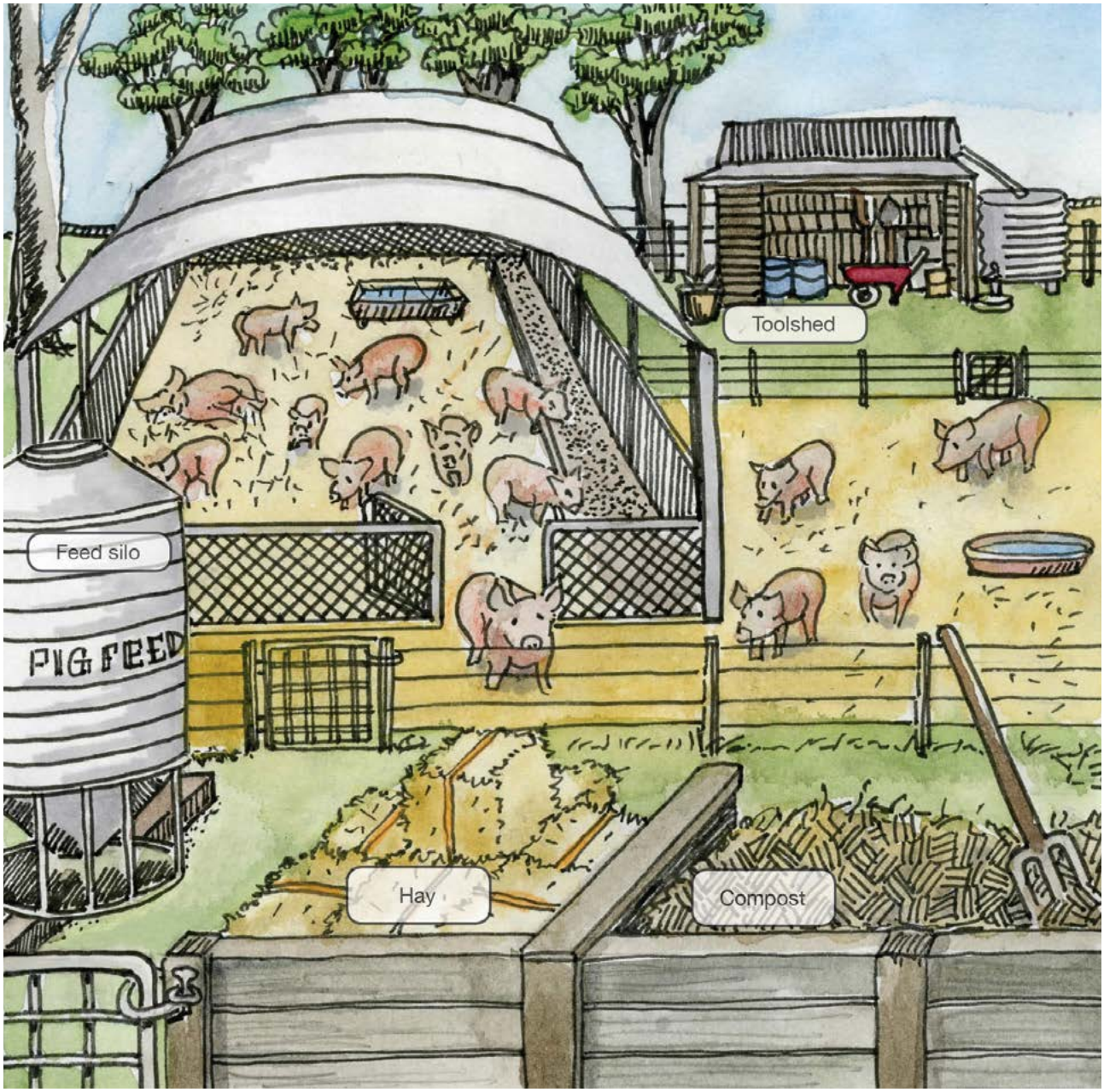


Illustration: Liz Grant, Designgrant

Explore plantation and native forest

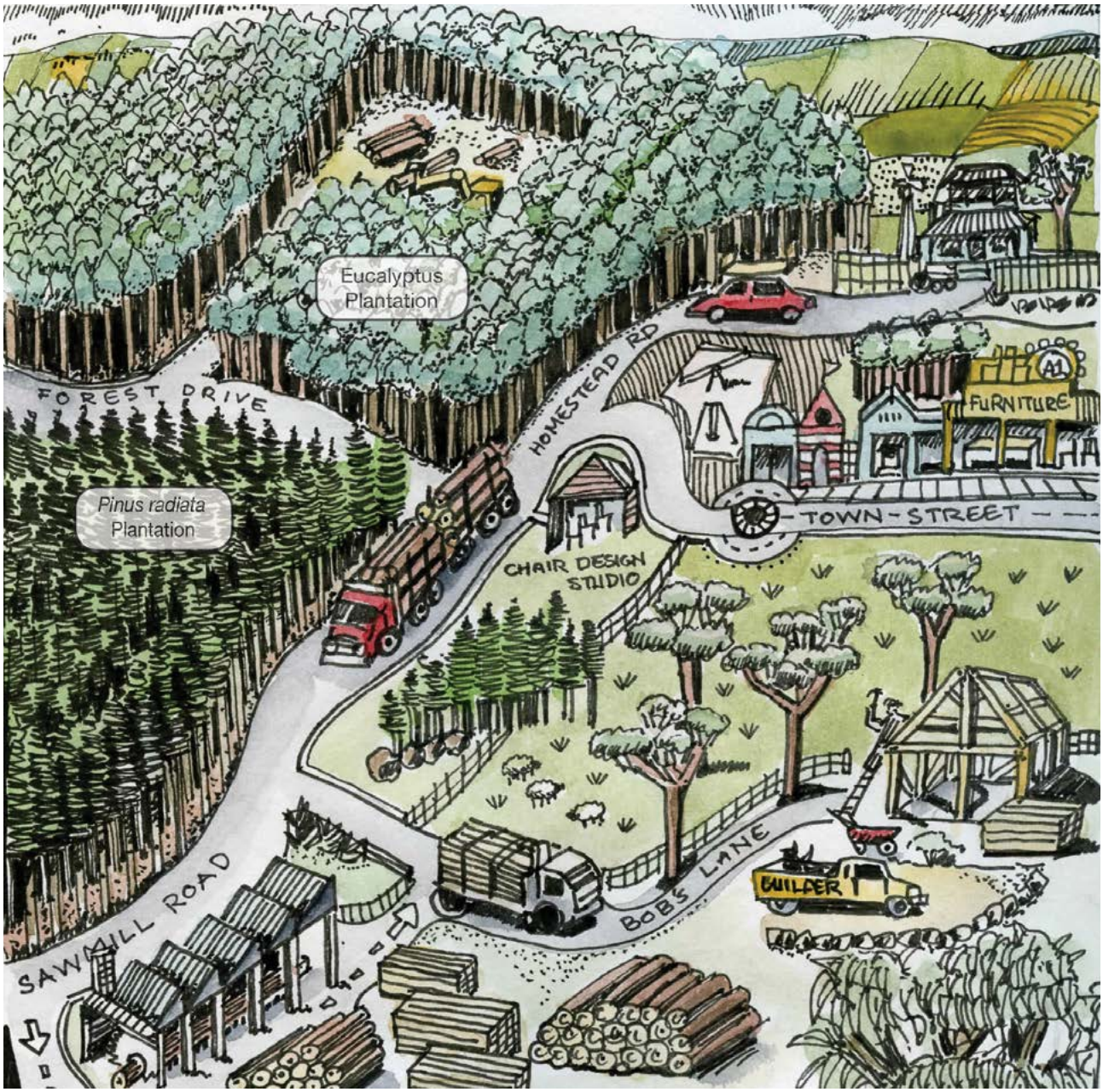


Illustration: Liz Grant, Designgrant

Explore a cattle and sheep farm

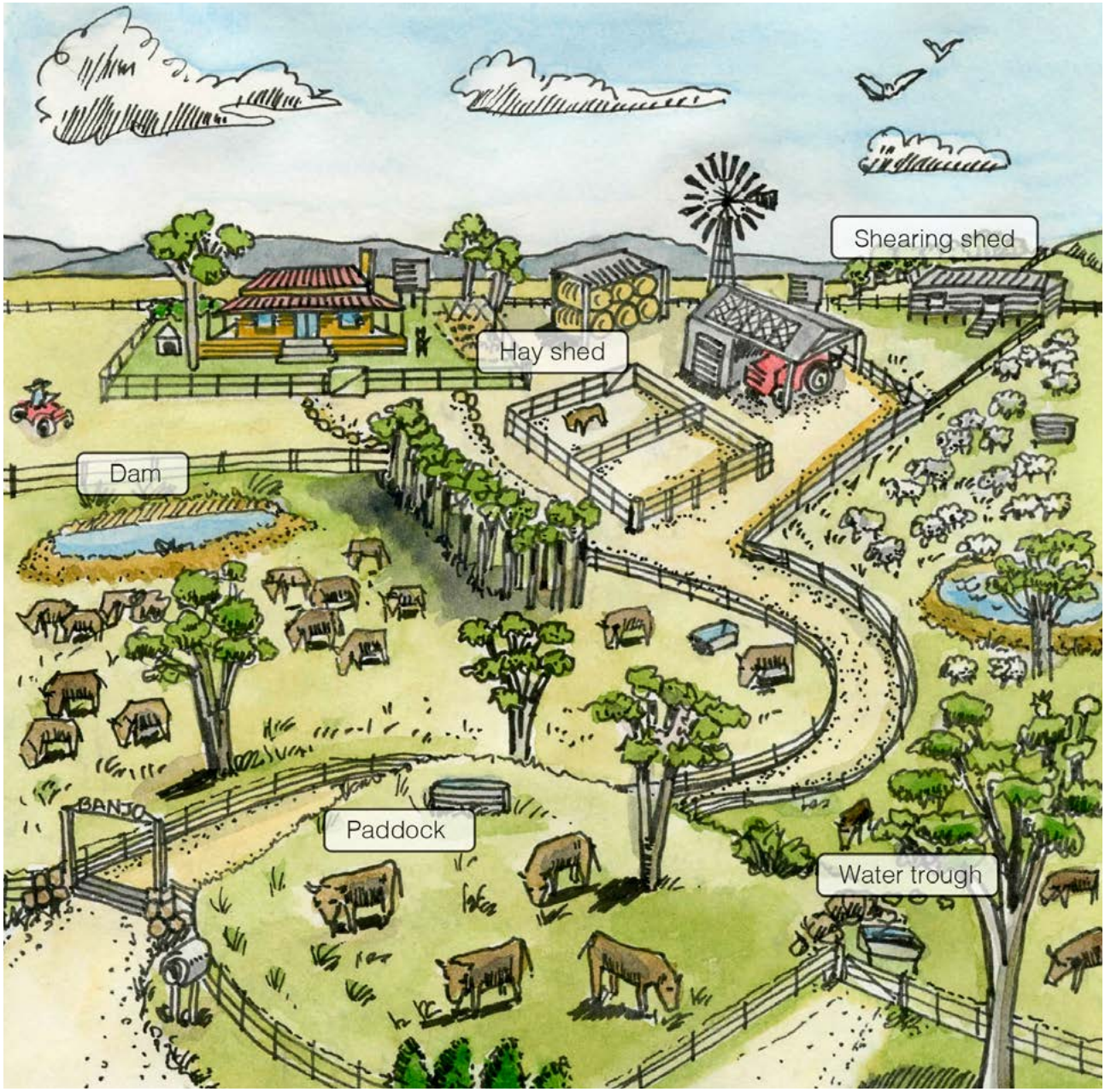


Illustration: Liz Grant, Designgrant

Explore a salmon farm

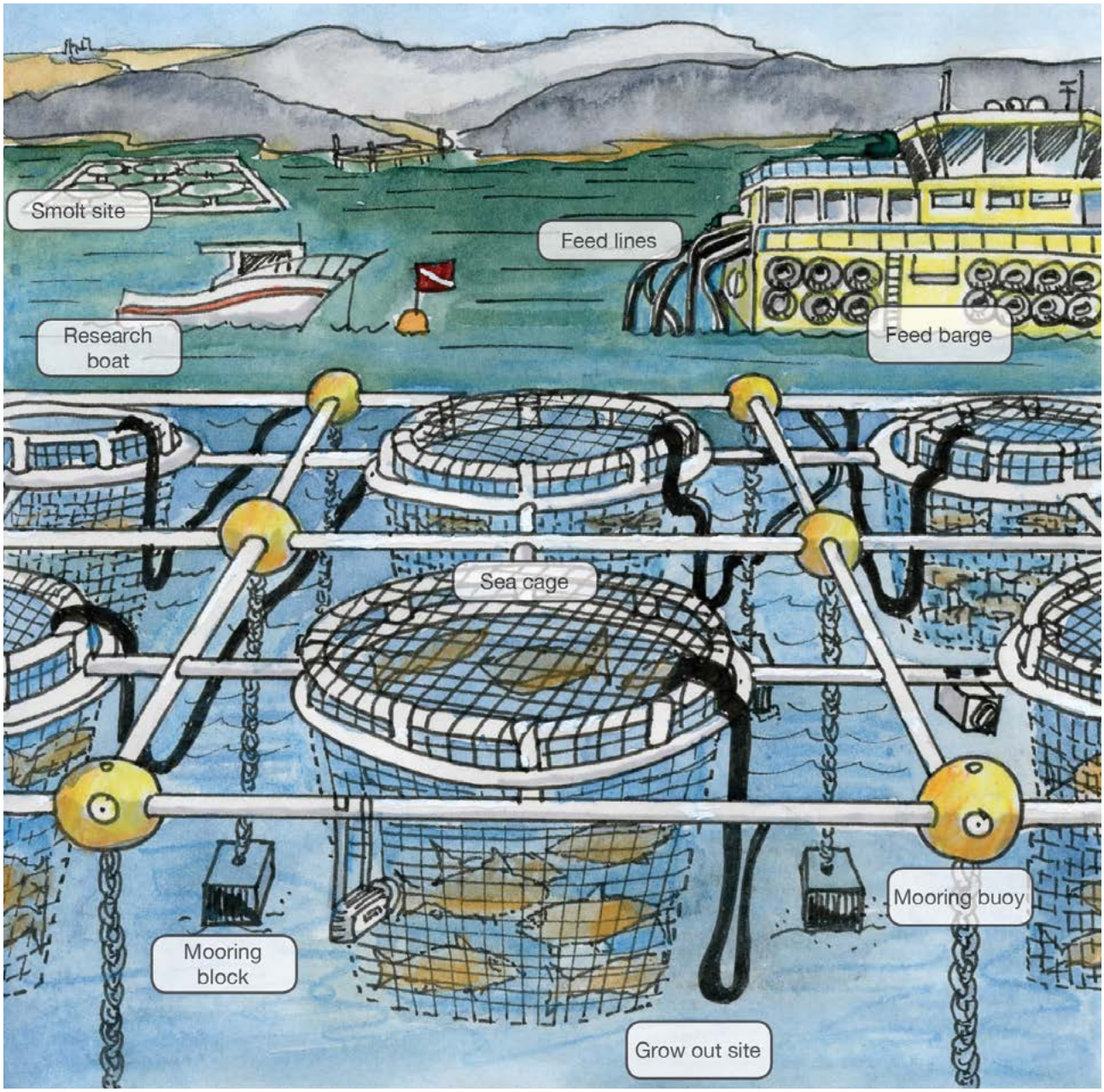


Illustration: Liz Grant, Designgrant

Explore a cotton farm

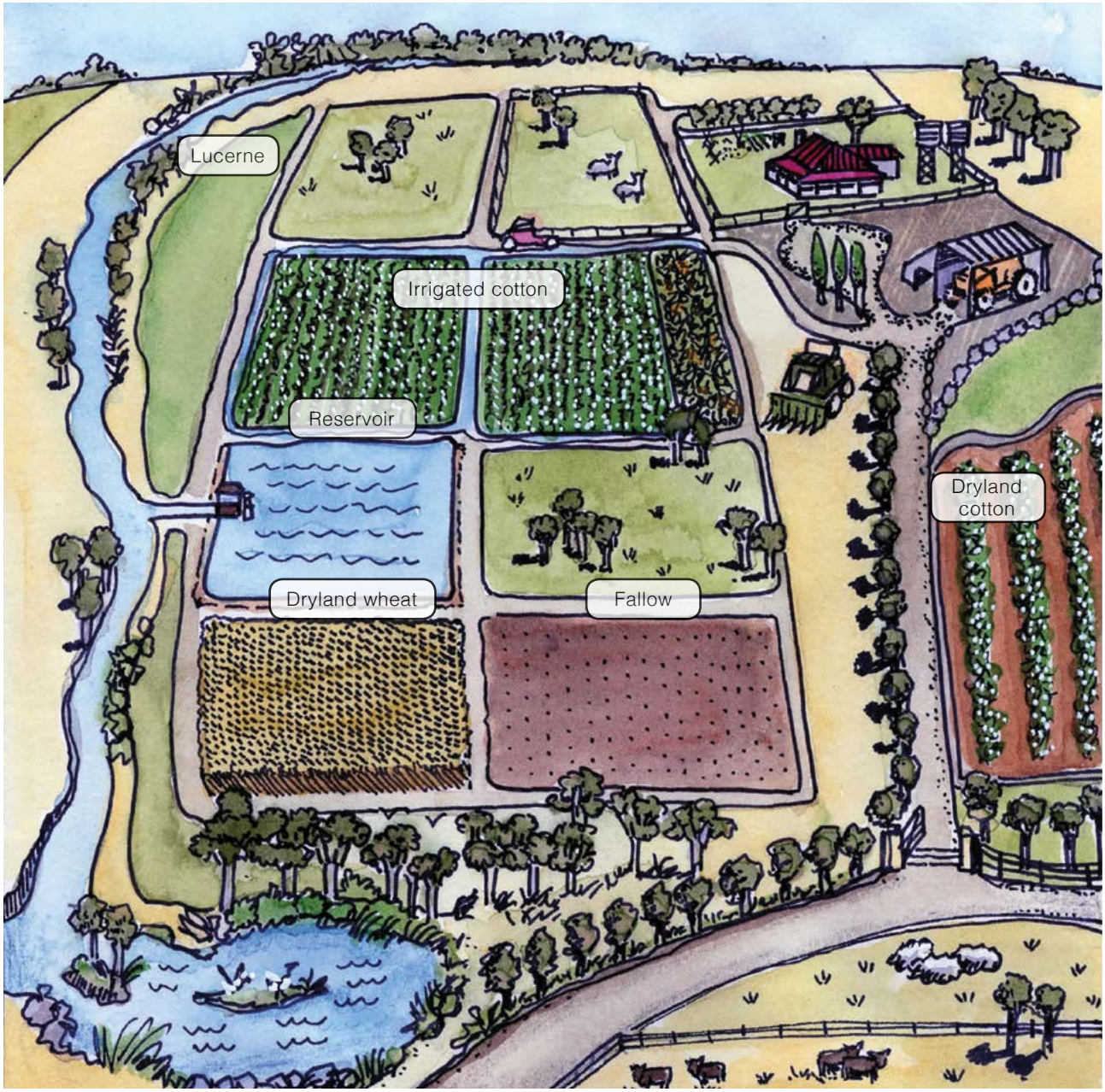


Illustration: Liz Grant, Designgrant

Resource 1.2

After reading an Envirostory, choose your favourite parts and describe them using the following table as a guide. Add drawings and labels.

Describe the setting	Who are the characters?
What problem do they face?	How do they solve it?

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