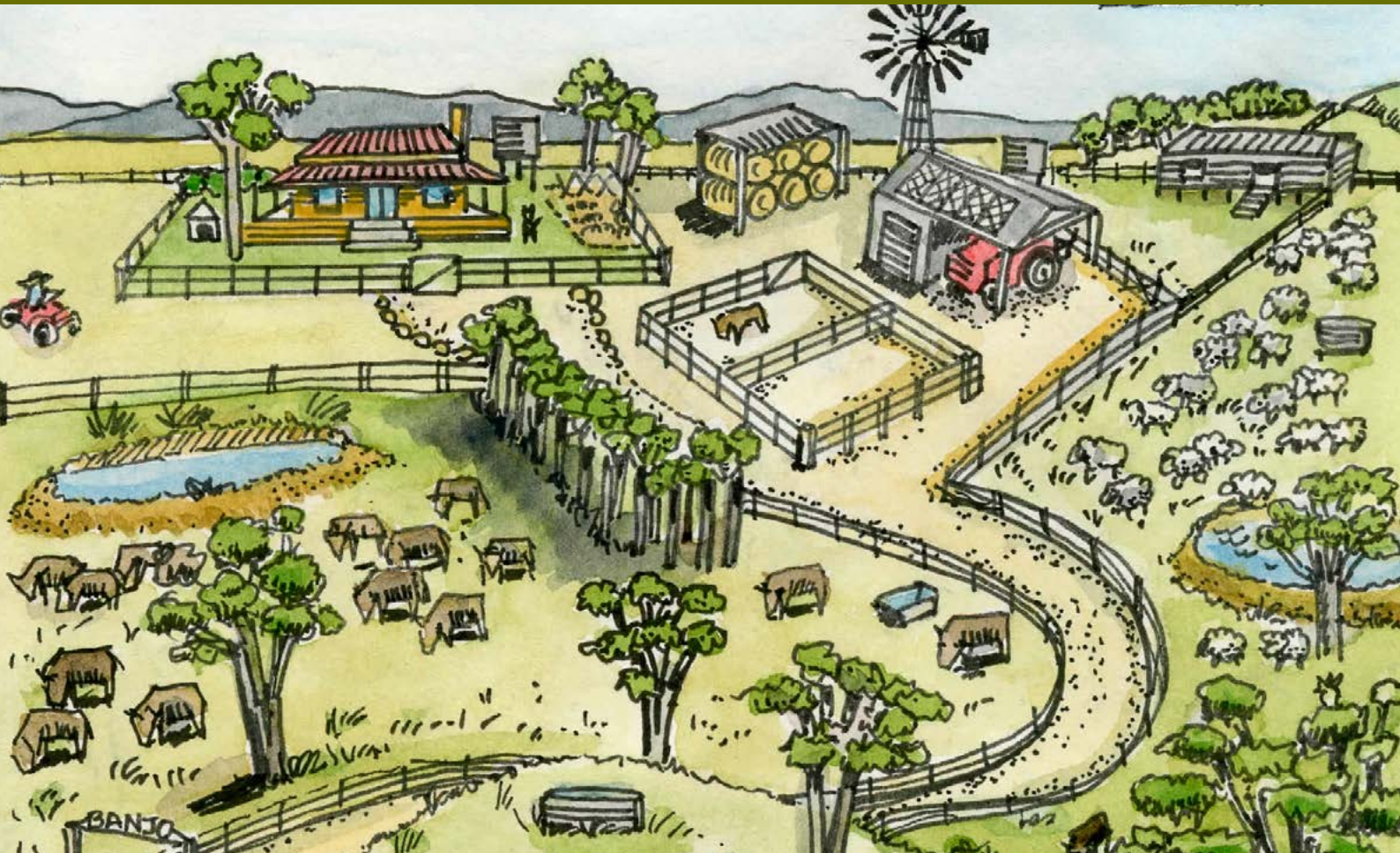




AN EDUCATIONAL UNIT FOR PRIMARY SCHOOLS



# Finding farms

YEAR 5

Design and Technologies,  
Mathematics and Geography

**primezone**  
The place for all your primary industry resources  
[www.primetimezone.edu.au](http://www.primetimezone.edu.au)

# Contents

Introduction.....	3
About the approach .....	4
Teacher notes .....	5
Australian Curriculum content descriptions .....	6
Implementing the unit and activities in the classroom .....	7
Some questions and possible answers .....	9
Fast facts about Australian agriculture.....	10
National Farmers' Federation Farm Facts 2012 .....	10
Meat and Livestock Industry .....	11
Fishing and Aquaculture Industry .....	11
Cotton Industry .....	12
Pork Industry .....	13
Forestry Industry .....	14
Step 1: Engage with the topic .....	15
Getting started .....	15
Step 2: Explore the topic .....	19
Explore maps and some primary industry sectors .....	19
Step 3: Explain understandings .....	24
Step 4: Elaborate on concepts and ideas.....	25
Presentation planning .....	25
Step 5: Evaluating .....	26
Think back and evaluate.....	26
References .....	27
Resources .....	29
Resource 1.1 .....	29

Cover illustration:  
Liz Grant, Designgrant

## Acknowledgements

The Primary Industries Education Foundation Australia in conjunction with the Australian Government produced this educational resource for the Agriculture in Education Initiative. This resource is designed to introduce young people to food and fibre production and primary industries in Australia.

The Primary Industries Education Foundation Australia would like to acknowledge and sincerely thank the education program reference group for offering comments on the drafts of materials in this educational resource. The education resource has been developed by Angela Colliver from Angela Colliver Consulting Services Pty Ltd and designed by Liese Howard from Modo Pty Ltd.

## Copyright information

© Primary Industries Education Foundation 2015, except where indicated otherwise.

This work by the Primary Industries Education Foundation is licensed under a Creative Commons Attribution 3.0 Australia license <http://creativecommons.org/licenses/by/3.0/au/deed.en> Under this license the material is available for free use and adaption. Educators may use, adapt, communicate and re-publish material from the resource.

You must include this statement on any copy or adaption of the material:

© Primary Industries Education Foundation 2015, except where indicated otherwise. This work is licensed under a Creative Commons Attribution 3.0 Australia license (see <http://creativecommons.org/licenses/by/3.0/au/deed.en>)

The material in this Unit of Work is made available for the purpose of providing access to general information about food and fibre production and primary industries in Australia.



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). This unit of work containing student activities assists students to raise questions, gather and process data, make conclusions and take action. 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 <http://www.primaryconnections.org.au/about/teaching>



## Resource description

This is a unit with five inquiry teaching sequences about exploring life on farms through the use of grid references to describe five primary industry sectors that produce food and fibres.

This unit encourages students to examine illustrated maps with grid references for five primary industry sectors that produce food and fibres and the natural or managed environment in which the food and fibres are grown.

As the unit progresses, the emphasis shifts to choosing a primary industry sector to research and create a grid reference system for others to use to locate objects and describe routes from one object to another.

Having explored maps and grid references and a primary industries sector, students then consolidate and present these understandings to an audience following the study.

At each stage in the investigations, the students are encouraged to share their findings about maps, grid lines and grid references, and farms that produce food or fibres and the products produced from them.

**Year level: 5**

## Curriculum focus

In this unit, students:

- Explore life on farms through digital resources
- Explore a range of maps
- Examine illustrated maps of farms using grid references to describe five primary industry sectors that produce food and fibres
- Investigate five primary industry sectors that produce food and fibres and the natural or managed environment in which the food and fibres are grown.
- Research a primary industry sector and create a grid reference system for others to use to locate objects and describe routes from one object to another
- Plan and conduct an investigation using maps and grid references and a primary industries sector
- Present these understandings to an audience following the study inviting them to use a grid reference system to locate objects and follow routes from one object to another
- Reflect and evaluate what they have learned about maps, grid lines and grid references, and farms that produce food or fibres and the products produced from them.

*Based on Australian Curriculum, Assessment and Reporting Authority (ACARA) materials downloaded from the Australian Curriculum website in February 2015. ACARA does not endorse any changes that have been made to the Australian Curriculum.*

Examine maps with grid references about five primary industry sectors that produce food and fibres and the natural or managed environment in which the food and fibres are grown.

# Australian Curriculum content descriptions

## Design and Technologies

**Strand:** Design and Technologies knowledge and understanding

Investigate how and why food and fibre are produced in managed environments

[ACTDEK021](#)

## Mathematics

**Strand:** Measurement and Geometry: Location and transformation

Use a grid reference to describe locations [ACMMG113](#)

Describe routes using landmarks and directional language [ACMMG114](#)

## Geography

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

Collect and record relevant geographical data and information, using ethical protocols, from primary and secondary sources, for example, people, maps, plans, photographs, satellite images, statistical sources and reports [ACHGS034](#)

## Cross Curriculum Priorities

### Sustainability

- OI.2:** All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing and survival.
- OI.3:** Sustainable patterns of living rely on the interdependence of healthy social, economic and ecological systems.
- OI.5** World views are formed by experiences at personal, local, national and global levels, and are linked to individual and community actions for sustainability.
- OI 7:** Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments.
- OI.8:** Designing action for sustainability requires an evaluation of past practices, the assessment of scientific and technological developments, and balanced judgments based on projected future economic, social and environmental impacts.

*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 primary years in Design and Technologies, Mathematics and Geography 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 also feature strongly as these methods develop important skills and ensure that the exploration of the topics are 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 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 priority of sustainability. They embrace content that we believe is of relevance and significance to all students. We encourage you to explore ways in which the content can be adjusted to the context in which you 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



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



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

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.*

- 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.*

- 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/>

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 (for example, 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](http://data.daff.gov.au/data/warehouse/9aam/afstad9aamd003/2012/AustFishStats_2012_v1.0.0.pdf)



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

## Cotton Industry

Australia's cotton growers produce yields almost three times the world average.

40% less water is needed to grow one tonne of cotton lint compared to 2003.

- 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's pig herd is one of the cleanest in the world.

- 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

Australia has 125 million hectares of forest, equivalent to 16% of its land area.

Forests protect soil and water resources as well as storing carbon.

- 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:

- gather information about student's prior knowledge about farms, different types of animals raised or crops grown and what they produce
- pool ideas and share with others
- build an interest in maps and map reading
- learn about maps with grid lines and grid references
- develop skills in making connections between ideas
- help set directions for an investigation
- provide data for assessment purposes.

### Farms

Much of the food and materials our community rely upon started as some form of agriculture on a farm. Whether it came from a field, a forest, a fishery, a piggery or a free range farm there was a natural or managed environment responsible for its growth.



Capture student interest and **FIND OUT** what they know about farms.

Talk with students about what they know about farms, whether they have ever visited one, have a family member who owns one or know of someone who farms as a way of living.



**DISCUSS** the diversity of farms that exist in Australia. **INTRODUCE** terms like fishery; forest; piggery; free range farm; cattle station; dairy farm; sheep farm; oyster farm; tree farm; cotton farm; vineyard; cherry farm, mixed farm etc.



Ask students to **RECORD** what they know about farms, where they are located, what they produce and for whom?

### Use e-Postcards



ABC OPEN's 'Video Postcards' project invites people across regional Australia to share a corner of their earth with the world.



**VIEW** the following Video Postcards and **INVESTIGATE** farms that produce some of our food and fibre sources.

**CHECK** the map on the bottom right hand corner of each page and **TALK** about where these farms are located in Australia.



**CHECK OUT** Preston in Tasmania. What food source is farmed there?

<https://open.abc.net.au/projects/video-postcards-30rs6yp/contributions/postcard-from-preston-rena-s-story-74vh5un>

**INVESTIGATE** what food Port Lincoln is famous for producing.

<https://open.abc.net.au/projects/video-postcards-30rs6yp/contributions/port-lincoln-the-tuna-town-98md5tv>



**FIND OUT** more about what is grown in Barooga, in the Goulburn Valley in Victoria.

<https://open.abc.net.au/projects/video-postcards-30rs6yp/contributions/i-love-barooga-at-harvest-time-53lq3pm>



**CHECK OUT** what's grown in Muttaborra in Queensland.

<https://open.abc.net.au/projects/video-postcards-30rs6yp/contributions/stepping-into-a-grazier-s-boots-04bk8ga>



**VIEW** the videos and use clues from the maps located in the bottom right hand corner of each page and student's background knowledge to **TALK** about these farms and the places they are located.



## Step 1: Engage with the topic

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.

### Immerse the students in the topic of maps

Introduce the term 'map'. Ask students what a map might be.



**SHOW** students different maps, for example Google Maps, a road map, a plan of the school, a street directory, a world map. **EXPLAIN** how maps are an explanation of places.



**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. Using Google Maps invite students to **FIND** where they live and where the school is located. Ask students to **OBSERVE** the streets travelled to get to school and to draw a map of the route taken.

See: <https://www.google.com.au/maps/>



**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.



Ask students in pairs or small groups to **DRAW** a 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.

### Aerial maps

**SIMULATE** an aerial map. **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.
- Use colours and symbols to **REPRESENT** the different objects.



**TALK** about how people have been making maps for hundreds of years and how old maps look very different from today's maps.



**SHOW** students a range of maps from the past.

See: <http://www.oldmapsonline.org/map/rumsey/0466.054> or <http://www.oldmapsonline.org/map/rumsey/0466.051>

**TALK** about how maps from the past were often made from sketches whereas today most maps are made using aerial photographs and satellite images.



**EXPLAIN** that aerial photographs are taken by cameras fitted to aeroplanes. **SHOW** students an example of aeroplanes and the cameras used. See: <http://www.aerialhotshots.com.au/aerial-surveillance.php>



### Brainstorm

Talk about how making maps of the way land is used can help us to understand the many things about an area.



**BRAINSTORM** ideas about how land use maps can show what is grown on farms; fished in oceans; and grown in forests. List key words and create a flow chart to show links between them.



**SHOW** students aerial photographs taken of farms in rural areas to consolidate understandings.

See: <http://www.aerialhotshots.com.au/rural-aerial-photography.php>

Using the 15 aerial photographs available on this site **TALK** with students about aerial photographs being a 'bird's eye view'.



**EXPLAIN** how land use maps can use symbols to show different types of land use and they can also use different colours to represent different land uses.



**BRAINSTORM** symbols that could be used to represent features seen in these photos. For example: a dam, river, shed, field, paddock, trees, or round yard.

**BRAINSTORM** symbols that could be used on maps to represent:

- cotton fields
- water tanks
- forest
- shelterbelt or windbreak
- shearing shed
- water troughs
- sheltered sheds
- aquaculture ponds
- tree plantings
- cattle and/or sheep yards

**COLLATE** and **DISPLAY** student ideas.

Making maps of the way land is used can help us to understand the many things about an area.



## Step 1: Engage with the topic

### Setting the task

*Note: This is a suggested assessment task*

**EXPLAIN** to the class that their task will be to work in small groups to **FIND OUT** more about maps with grid lines and grid references and **LOCATE** symbols to show different places and locations on farms.



Explain that each group will **INVESTIGATE** maps relating to five primary industry sectors that produce food and fibres. They will also **EXPLORE** the natural or managed environment in which the food and fibres are grown.



Explain that each group will **CHOOSE** one primary industry sector, **RESEARCH** it and either, **WRITE** and **DRAW** or design and **MAKE** a game with a grid reference system for others to use accompanied by a text that challenges them to locate objects and follow routes from one object to another.

Explain that later in the unit each student will also **CHALLENGE** others to use their student-created grid reference system to **LEARN** more about a primary industry sector and what it produces.

Investigate maps relating to primary industry sectors that produce food and fibres and also explore the natural or managed environment in which the food and fibres are grown.



## Step 2: Explore the topic

### Explore maps and some primary industry sectors

#### Purpose

To provide students with opportunities to develop their understanding of:

- maps with grid lines and grid references
- symbols used on maps
- land use maps
- primary industry sectors that produce food and fibres
- a focus for the forthcoming experiences in the 'Explain' stage of the inquiry.

#### Things with grid lines and grid references



As a class **VIEW** a selection of tools and maps with grid lines and grid references.

**VIEW** a simple Excel spreadsheet and **TALK** about how it uses grid lines in the lines going both across and up and down the sheet, forming a grid.

**LOOK AT** creative ways students from across the world have incorporated grid lines into hand drawn maps.



**SEE** 'The World Map in My Cone Hat' drawn by Nguyen Thi Phoung Anh, aged 12, from Vietnam: <http://children.library.carleton.ca/cgi-bin/childmap/picture.php?Number=1995-121w>



**VIEW** 'My Place is Puzzling to Me' by Francisco M. Monares Leon, aged 10 from United State of America: <http://www.explokart.eu/petchenik/submissions/US-2.jpg>



**LOOK** at 'The World of My Dreams' by Altug Namik Yavas, aged 8 from Turkey: <http://children.library.carleton.ca/cgi-bin/childmap/picture.php?Number=2013-140w>

**CHECK OUT** 'Life in the Universe' by Meric Senduran, aged 10 from Turkey: <http://www.explokart.eu/petchenik/submissions/TR-6.jpg>



**VIEW** 'The World in My Hand' by Allison Lee, aged 9 from Canada: <http://www.explokart.eu/petchenik/submissions/CA-3.jpg>



Lastly, **LOOK** at 'The Man and Transformation of the World' by Thaïs Martins Raposeiro, aged 12 from Brazil: <http://www.explokart.eu/petchenik/submissions/BR-6.jpg>



Using the grid within Thaïs's map, **INTRODUCE** students to the language of grid references. **NUMBER** the grids going up and down his map that can allow students to pin point a place on his map. See: <http://www.explokart.eu/petchenik/submissions/BR-6.jpg>



Using the grid references **ASK** questions like:

- Where is Brazil located?
- What grid references can be used locate Russia?
- What grid references locate Canada?
- How might we use grid references to show the location of Argentina?

Look at creative ways students from across the world have incorporated grid lines into hand drawn maps.



## Step 2: Explore the topic

Explain that maps use symbols, little pictures or shapes, to represent things in real life.

### Explore more maps with grids



**VIEW** 'The World in a Click' by Ana Carolina Otton Sarmanho, aged 12 from Brazil.

See: <http://children.library.carleton.ca/cgi-bin/childmap/picture.php?Number=2011-23w>



**CONSIDER** a keyboard just like a grid referencing tool and invite students to **DEVISE** questions using the names of the number and alphabet keys to pinpoint places featured in Ana's map.

For example:

- Can you find the country located at V 4? It begins with the letter 'V'.
- See if you can name the country located at C 3? It begins with the letter 'C' and its capital city is Bogota.
- Name the two countries that are located at S 2.5.
- Find the two European countries located at Y 6.5.
- Play games using the keys!

### Maps with symbols

**EXPLAIN** to the class that maps also use symbols, little pictures or shapes to represent things in real life. For example a white square with a red cross on it might represent a hospital.

Ask students to **VISUALISE** a weather map, as they use different symbols to show us how the weather is changing, and what type of weather we should expect. Elicit ideas from students about the symbols they can recall on weather maps.

Extend ideas about symbols used on maps by viewing more student made maps in Barbara Petchnick's World Map Competition.



**VIEW** a map titled 'The map of the world' by Nikola Zlatanov, aged 7 from Bulgaria at: <http://children.library.carleton.ca/cgi-bin/childmap/picture.php?Number=1999-11w>



**LOOK AT** how she incorporated symbols to show different types of land use.



**VIEW** a map titled 'Wild animals – Inhabitants of land and sea' by Kamila Sojka, aged 12 from Poland, and discuss the different symbols of animals found on the map and places where they are located: <http://children.library.carleton.ca/cgi-bin/childmap/picture.php?Number=1999-67w>





## Step 2: Explore the topic

### RESEARCH TASK: PART 1

#### Investigate maps with grids

Re-state to the class that they will be viewing illustrated maps with grid lines and grid references to:

- **LOCATE** different places and locations on farms
- **LEARN** about five primary industry sectors that produce food and fibre and the natural or managed environment in which the food and fibre are grown.

#### Form groups

Form groups and **ASK** groups to:



- Use the grid references printed on the illustrated maps located in **Resource 1.1** to **FIND** places and locations on farms.
- **USE** the letters across the bottom of the maps for the first part of the grid reference and the numbers up the side for the second part of the grid reference.



- **EXPLORE** features of the primary industry sector featured in each map.



- **CATEGORISE** and **LIST** the natural (living) and managed (non-living) elements of the place in which the food and fibre are grown.



- Use these understandings to **DRAW** or **DESIGN** and **MAKE** a game with a grid reference system for others to use, accompanied by a text that challenges them to locate objects and follow routes from one object to another.

Learn about five primary industry sectors that produce food and fibre and the natural or managed environment in which the food and fibre are grown.

#### View maps with grids about five primary industry sectors

**EXPLAIN** to the students that their task is to start researching. Invite students in their groups to **VIEW** the following maps, and **RECORD** grid references about places and locations found on each one of the maps.

**Resource 1.1** features six illustrated maps.



Using the maps with grid references **INVESTIGATE** and **LOCATE** the natural or managed environmental elements of the place where food and fibres are grown. Ask students to **CATEGORISE** and **LIST** the natural (living) and managed (non-living) elements of the place where the food and fibres are grown that can be seen on the maps and record these using grid references.





Identify, describe and record the food or fibre produced, and the natural (living) and managed (non-living) elements of the environment in which the food and fibres are grown.

### Deciding on a primary industries sector to find out more about



Encourage the students to **CHOOSE** a primary industries sector to find out more about.

Explain that their task is to **FIND OUT** more about one industry sector that produces food and fibre and the natural or managed environment in which the food and fibre are grown.

Re-state that each group of students will **WRITE** and **DRAW** or **DESIGN** and make a game with a grid reference system for others to use accompanied by a text that challenges them to locate objects and follow routes from one object to another.

### More resources



In assigned groups, invite students to **CHOOSE** from the 'relevant primary industries' featured below as a starting point and **IDENTIFY**, **DESCRIBE** and **RECORD** the food or fibre produced by the sector they chose, and the natural (living) and managed (non-living) elements of the environment in which the food and fibres are grown.

For Australian Cotton producers see:

<http://cottonaustralia.com.au/cotton-classroom>

[http://cottonaustralia.com.au/uploads/publications/POCKET\\_GUIDE\\_-\\_FINAL.pdf](http://cottonaustralia.com.au/uploads/publications/POCKET_GUIDE_-_FINAL.pdf)

<http://www.youtube.com/watch?v=cbKh1Xtfmao&list=UUCtSqcz7PRPX1b13J3ORv-g&index=3>

<http://www.youtube.com/watch?v=2yEpXeBVVg4>

<http://www.youtube.com/watch?v=QRwCRGopwHE>

<http://www.youtube.com/watch?v=QgXPMFR6nqY>

For Fisheries and Aquaculture in Australia see:

<http://fish.gov.au/>

<http://www.youtube.com/watch?v=V2ZHabeg3kw&list=PLC8B09244EFAEE63A>

For Australian Oyster Farming see:

<http://www.oystersaustralia.org.au/farming>

For Salmon Farming see:

<http://www.tsqa.com.au/salmon-farming/>

For Australian Pork producers see:

<http://www.aussiepigfarmers.com.au/looking-after-the-environment/>

<http://www.aussiepigfarmers.com.au/types-of-farming/indoor-intensive-housing/>

<http://www.aussiepigfarmers.com.au/types-of-farming/barn-reared-eco-housing/>

<http://www.aussiepigfarmers.com.au/types-of-farming/free-range>

For Australian Beef and Lamb producers see:

<http://virtualfarm.mla.com.au/>

<http://www.target100.com.au/Farmer-stories>

<http://www.mla.com.au/Cattle-sheep-and-goat-industries>

<http://www.youtube.com/Target100AUS>

For Forest Management and Timber producers see:

<http://forestlearning.edu.au/find-a-resource/article/28/going-bush-various-demand-for-plantation-and-native-forests.html>



## Step 2: Explore the topic

### Develop a retrieval chart

When investigations are completed as drafts, remind groups to **DEVELOP** a retrieval chart on which students' **DOCUMENT** information and ideas are collected.

### RESEARCH TASK: PART 2

Remind students of the remaining focus of their task:



- To **FIND OUT** more about one industry sector that produces food and fibre and the natural or managed environment in which the food and fibre are grown.



- To **WRITE** and **DRAW** or **DESIGN** and make a game with a grid reference system for others to use, accompanied by a text that challenges them to locate objects and follow routes from one object to another.





## Step 3: Explain understandings

### Purpose

To provide students with opportunities to:

- describe a primary industries sector that grows food or fibre
- explain what it produces and describe the natural (living) or managed (non-living) elements of the environment in which food and fibre are grown
- gather information about the topic
- develop skills of formulating questions and gathering data
- develop communication skills
- develop the understanding of how we can learn from others
- develop a storyboard.

Prepare a presentation using a grid reference system for others to use to locate objects and describe routes, explaining how one sector produces food or fibre.

### Approaches to producing food and fibre



Using the information gathered, each group prepares a presentation using a grid reference system for others to use to locate objects and describe routes, explaining how one sector produces food or fibre.

Encourage students to use a clear grid referencing system as part of their presentation.



Remind students to **CONSIDER** a presentation technique that will engage someone to interact with their grid system and asks another person to locate and find objects, places and routes taken in a primary industry sector.

### Open-ended questions



Ask students what they know about open-ended questions and what they are used for.

**VIEW** or **LISTEN** to various presentations where someone is using questions to engage another person in playing a game or interacting with a challenge from a television game show or YouTube videos where games are being played. Ask students:

- What is the role of the questioner?
- What was the role of the other person?
- What information was the questioner trying to gather?
- What types of questions are being asked?
- How effective were the questions?



Ask students to **DRAFT** a range of questions they might use to engage someone, or more than one person, to **INTERACT** with their grid system which asks another person to **LOCATE** and **FIND** objects, places and routes taken in a primary industry sector.

For example:



- Look at Map A and then Map B and **DISCOVER** the different locations on the cotton farm. **CALL OUT** the grid references that feature something natural on the cotton farm.
- **GIVE** the grid reference for the location of the start of the irrigation channel.
- **SHARE** the grid reference for where the cotton seed is stored.
- Invite students to **PRACTICE** creating such questions as part of their presentation planning.
- **REHEARSE** questions.

### Decide on what to present and how to do so



Re-state the purposes of the task and ask students to **CONSIDER** how they are going to bring their information together and present it so that the main points come across clearly. **MODEL** the construction of video and slideshow tools. Students now use the information they have gathered to **CONSTRUCT** a presentation for the research being undertaken.

See: <http://cooltoolsforschools.wikispaces.com/> for ideas.



## Step 4: Elaborate on concepts and ideas

### Presentation planning

#### Purpose

To provide students with opportunities to:

- share their maps with grid lines and grid references
- apply what they have learned and communicate the food and fibre types that can be grown in the primary industries sector and the natural or managed environment in which the food or fibre are grown
- plan their presentation
- conduct their presentation
- share investigation findings.

#### Working with the information, maps and grid references

A number of strategies can be used to help students finalise their presentation planning.

**MODELLING** creative ideas might assist.

Invite students to **CONSIDER** something like...

##### *Tim's Tour of...*

*Come on a tour of...*

*You will have a map and directions.*

*Around each map are letters and numbers to help you find your way.*

*A compass shows the directions of north, south, east and west.*

*A key identifies local routes and distances.*

*There are fibres we use and foods we eat hidden on the farm.*

*See if you can find them all.*

##### *Pepa's tour of...*

*Join Pepa pig and her friends to begin your tour of...*

*Travel through the farm, its surroundings, along creeks and through treacherous swamps.*

*Pepa has hidden... somewhere along the way. See if you can find it.*

##### *Instructions:*

*Moor your canoe at the Yass River (E1) Take the sandy path east. Where the path splits...*

#### Going further with the planning of the presentation

Invite students to **CONFIRM** the idea planned for their presentation.



Ask students to **CREATE** a final plan for completing the presentation.

Students may need to **DOCUMENT** their key messages, **CREATE** an image bank and **COLLATE** references and acknowledgements for their work sample. Invite them to summarise these and the learning achieved in a journal, log or reflection.

#### Review and submit

*Note: This is a suggested assessment task.*



Invite students to **REVISE** and fine-tune their presentation using a map with a grid reference system to **ENGAGE** someone, which asks another person to **LOCATE** and **FIND** objects, places and routes taken in a primary industry sector.



**CONSIDER** hosting an afternoon of presentations to showcase the students' work to the school community and beyond.

Or **HOLD** a Game Day!



## Step 5: Evaluating

### Think back and evaluate

#### Purpose

To provide students with opportunities to:

- reflect on their own learning
- collate data for assessment.

To provide teachers with:

- insights into students' understanding and attitudes, as well as their perceptions of their own strengths and weaknesses.

#### Reflective writing

Begin by modelling reflective 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 writing:

- Write about something new you learnt in this unit about maps with grid references.
- What is one thing I have learnt about when it comes to farming?
- How might I help others know more about how Australian farmers produce fibre and food?
- What have I learnt about a primary industries sector?
- What would I still like to find out about the sector?
- How well did I/we participate in any group/team learning activities?
- What questions do you have about the topic at the moment?
- What piece of work am I most satisfied with?



# 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.
- Cross, J. (1994) *Long Ago and Far Away: Activities for using stories for history and geography at Key Stage 1*, Development Education Centre, Birmingham.
- 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 Curtin, Melbourne.
- Hicks, D. (1994) *Education For The Future – a practical classroom guide*, World Wildlife Fund.
- 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.

### ABC Open

I love Barooga at harvest time <https://open.abc.net.au/projects/video-postcards-30rs6yp/contributions/i-love-barooga-at-harvest-time-53lq3pm>

Port Lincoln - the tuna town <https://open.abc.net.au/projects/video-postcards-30rs6yp/contributions/port-lincoln-the-tuna-town-98md5tv>

Postcard from Preston - Rena's story <https://open.abc.net.au/projects/video-postcards-30rs6yp/contributions/postcard-from-preston-rena-s-story-74vh5un>

Stepping into a grazier's boots <https://open.abc.net.au/projects/video-postcards-30rs6yp/contributions/stepping-into-a-grazier-s-boots-04bk8ga>

### Aerial Hotshots:

Aerial Surveillance <http://www.aerialhotshots.com.au/aerial-surveillance.php>

Rural Aerial Photography <http://www.aerialhotshots.com.au/rural-aerial-photography.php>

### Australian Bureau of Statistics

Agricultural Commodities, Australia, 2012-2013 <http://www.abs.gov.au/ausstats/abs@.nsf/mf/7121.0>

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

### Australian Forestry Standard

<http://www.forestrystandard.org.au/>

### Australian Government Department of Agriculture

<http://www.agriculture.gov.au/forestry>

### Australian Pork Limited

<http://www.australianpork.com.au>

Looking after the environment <http://www.aussiepigfarmers.com.au/looking-after-the-environment/>

Types of farming. Free range <http://www.aussiepigfarmers.com.au/types-of-farming/free-range>

Types of farming. Indoor intensive farming <http://www.aussiepigfarmers.com.au/types-of-farming/indoor-intensive-housing/>

Types of farming. Outdoor bred <http://www.aussiepigfarmers.com.au/types-of-farming/barn-reared-eco-housing/>

### Barbara Petchenick - Children's World Map Competition:

Carleton Children's Library, California:

The map of the world - by Nikola Zlatanov <http://children.library.carleton.ca/cgi-bin/childmap/picture.php?Number=1999-11w>

The world in a click - by Ana Carolina Otton Sarmanho <http://children.library.carleton.ca/cgi-bin/childmap/picture.php?Number=2011-23w>

The world map in my cone hat - by Nguyen Thi Phuong Anh <http://children.library.carleton.ca/cgi-bin/childmap/picture.php?Number=1995-121w>

The world of my dreams - by Altug Namik Yavas <http://children.library.carleton.ca/cgi-bin/childmap/picture.php?Number=2013-140w>

United pieces <http://children.library.carleton.ca/cgi-bin/childmap/picture.php?Number=2003-23w>

Wild animals - inhabitants of land and sea - by Kamila Sojka <http://children.library.carleton.ca/cgi-bin/childmap/picture.php?Number=1999-67w>

### Explokart:

Life in the Universe - by Meric Senduran <http://www.explokart.eu/petchenik/submissions/TR-6.jpg>

My place is puzzling to me - by Francisco M. Monares Leon <http://www.explokart.eu/petchenik/submissions/US-2.jpg>

The man and transformation of the world - by Thais Martins Raposeiro <http://www.explokart.eu/petchenik/submissions/BR-6.jpg>

The world in my hand - by Allison Lee <http://www.explokart.eu/petchenik/submissions/CA-3.jpg>

### Cool Tools for Schools

<http://cooltoolsforschools.wikispaces.com/>

## References

Cotton Australia

<http://www.cottonaustralia.com.au>

Cotton Australia. Cotton Classroom <http://cottonaustralia.com.au/cotton-classroom>

Pocket Guide to Cotton [http://cottonaustralia.com.au/uploads/publications/POCKET\\_GUIDE\\_-\\_FINAL.pdf](http://cottonaustralia.com.au/uploads/publications/POCKET_GUIDE_-_FINAL.pdf)

Creative Commons

<http://creativecommons.org/licenses/by-nc-sa/3.0/au/>

Fisheries Research Development Corporation

<http://frdc.com.au/>

<http://fish.gov.au/>

Forest Learning

<http://www.forestlearning.edu.au>

Going Bush - various demands for plantation and native forests <http://forestlearning.edu.au/find-a-resource/article/28/going-bush-various-demand-for-plantation-and-native-forests.html>

Forest Stewardship Council Australia

<http://au.fsc.org/>

Garnaut Climate Change Review

<http://www.garnautreview.org.au/>

Google Maps

<https://www.google.com.au/maps/>

Meat and Livestock Australia

<http://www.mla.com.au>

Cattle, sheep and goat industries <http://www.mla.com.au/Cattle-sheep-and-goat-industries>

The Virtual Farm Visit <http://virtualfarm.mla.com.au/>

National Farmers' Federation. Farm Facts

<http://www.nff.org.au/farm-facts.html>

Old Maps Online

<http://www.oldmapsonline.org/map/rumsey/0466.054>

<http://www.oldmapsonline.org/map/rumsey/0466.051>

Oysters Australia

<http://www.oystersaustralia.org.au/farming>

Primary Connections

<http://www.primaryconnections.org.au/about/teaching>

Target 100

<http://www.target100.com.au>

Target 100. Farmer Stories <http://www.target100.com.au/Farmer-stories>

Tasmanian Salmonoid Growers Association

<http://www.tsga.com.au/salmon-farming/>

Wood, Naturally Better

<http://www.naturallybetter.com.au/>

YouTube videos:

Art4Agriculture. I Grow Cotton and You Wear It Says Richie Quigley <http://www.youtube.com/watch?v=2yEpXeBVVg4>

Australian Cotton Limited. ABC News – Fine Cotton by Sarah Clarke <http://www.youtube.com/watch?v=QRwCRGopwHE>

Australian Cotton Limited. ABC News – BMP Cotton by Sarah Clarke <http://www.youtube.com/watch?v=QgXPMFR6nqY>

Cotton Australia. The Australian Cotton Story Primary Version <http://www.youtube.com/watch?v=cbKh1Xtfmao&list=UUcTsQcz7PRPX1bl3J3ORv-g&index=3>

Fisheries Research Development Corporation Channel. Series 11. By-catch Reduction Devices. Episode 8 <http://www.youtube.com/watch?v=V2ZHabeg3kw&list=PLC8B09244EFAEE63A>

Target 100 Channel <http://www.youtube.com/Target100AUS>

## Resource 1.1

### Explore a piggery

Many schools in Australia have farms. Explore a school's pig farm in detail with the help of a map. Can you find the following places and locations on the map below?

Make sure you write the grid references down next to each question.

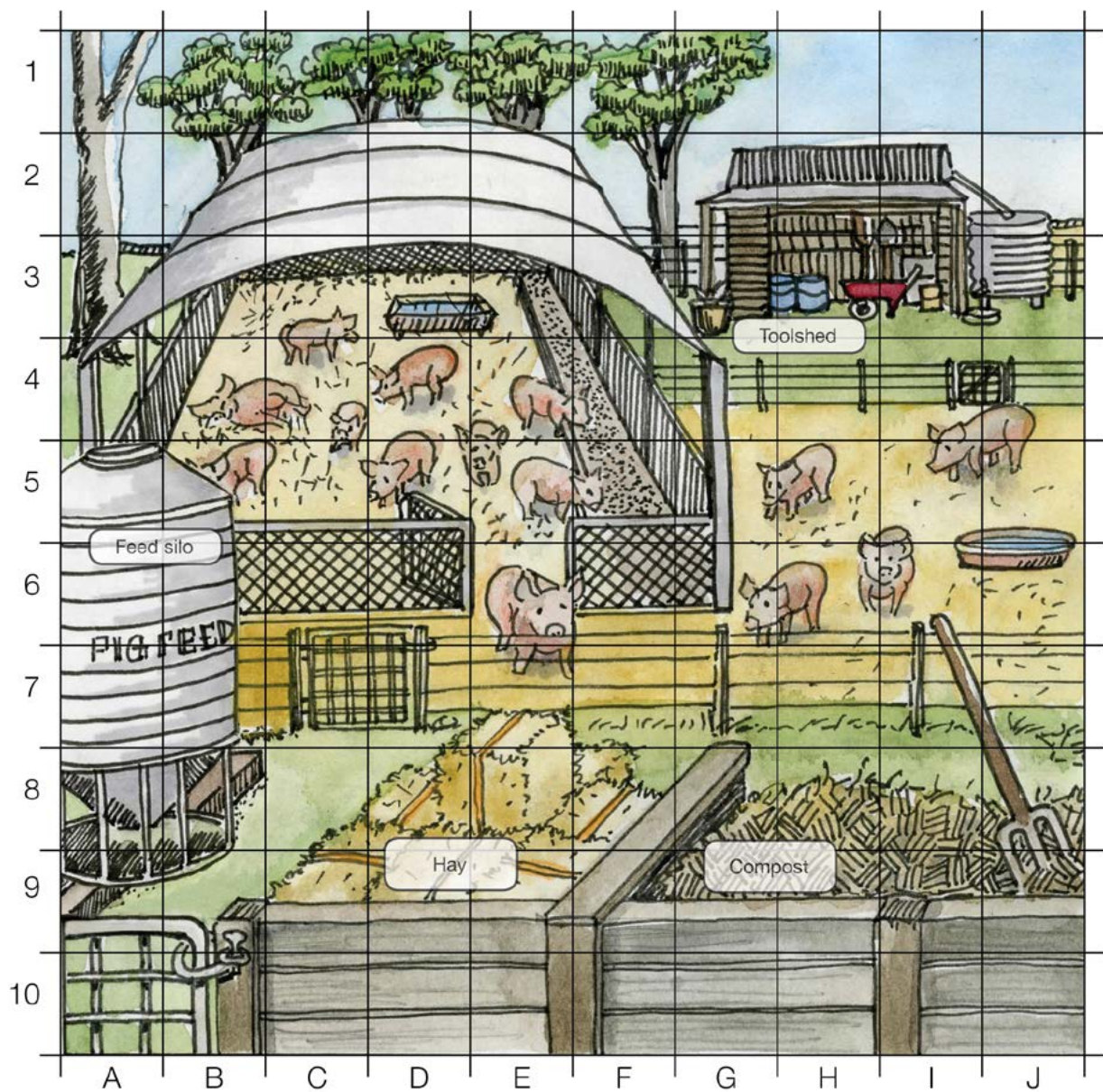


Illustration: Liz Grant, Designgrant

Pigs are usually housed in Eco-Shelters in schools. These are normally large open-sided sheds with hoop-like structures that hold up a roof cover. Can you find one and describe its location?

References: \_\_\_\_\_

Pigs are fed each day. Pigs usually step up to a feeder to get the food. Where can you find lots of pigs feeding?

References: \_\_\_\_\_

Pig feed is always stored so that it stays fresh and clean. Can you locate the feed silo in which the pig feed is stored?

References: \_\_\_\_\_

Can you find the bedding hay? Look for the hay bales that are stacked close to the fence.

References: \_\_\_\_\_

Can you find the two water troughs where pigs get their water?

References: \_\_\_\_\_

See if you can categorise all the places found in a school piggery into 'natural features' and 'built environment features'.

Natural features	Built environment features

Use the map to help you complete the key for the map.

Key:

- D 9 \_\_\_\_\_

G 9 \_\_\_\_\_

B 6 \_\_\_\_\_

D 3 \_\_\_\_\_

G 3 \_\_\_\_\_

H 3 \_\_\_\_\_
- J 3 \_\_\_\_\_

J 9 \_\_\_\_\_

I 2 \_\_\_\_\_

H 8 \_\_\_\_\_

B10 \_\_\_\_\_

E 6 \_\_\_\_\_



### Explore a cotton farm

Cotton is grown under the Australian sun on over 1,000 cotton farms from Emerald in the north of Queensland to Griffith in Southern New South Wales.

Can you find the following places and locations on the map below?

Make sure you write the grid references down next to each question.

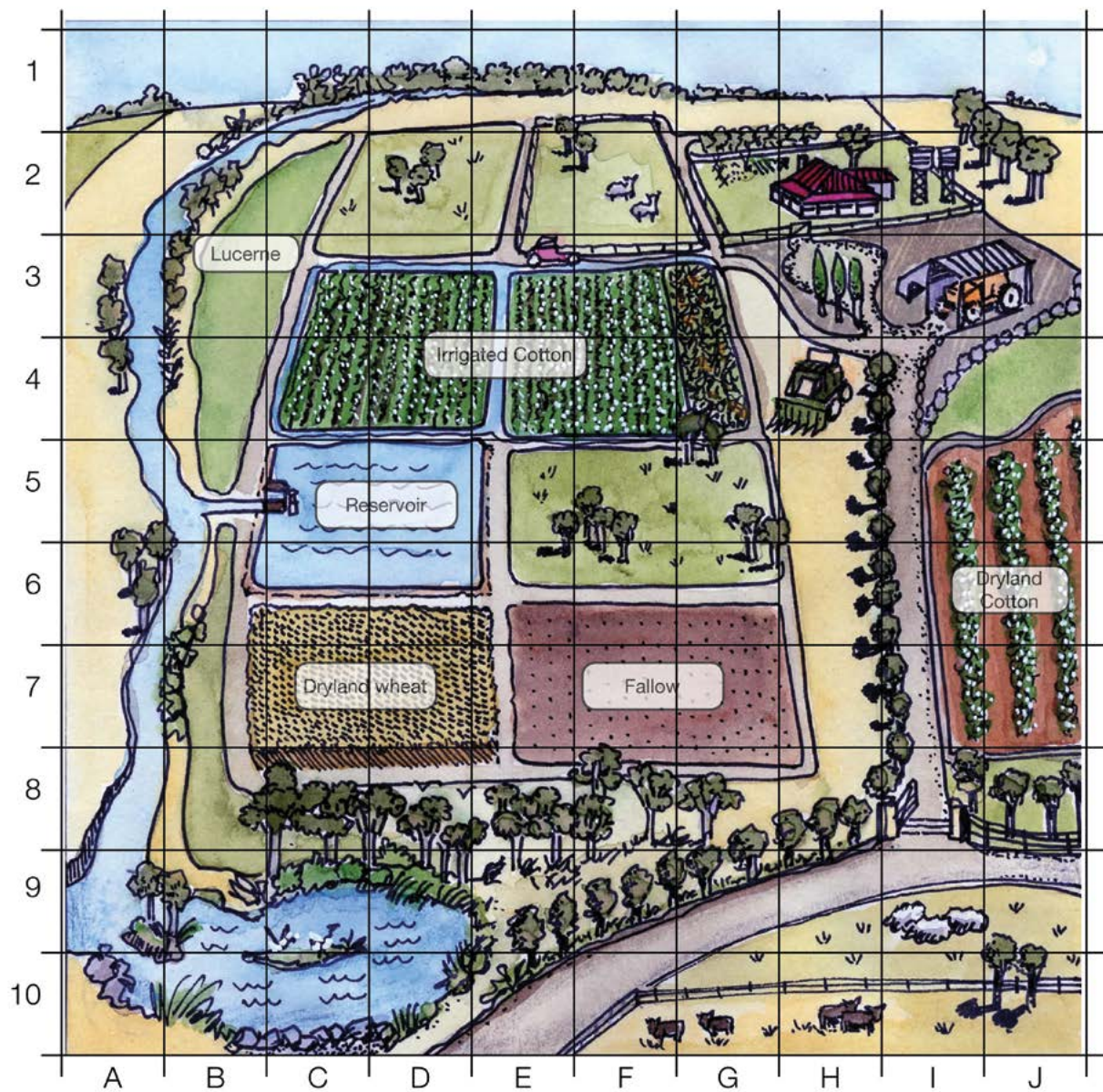


Illustration: Liz Grant, Designgrant

The average cotton farm grows other crops and also grazes sheep and cattle. Can you locate the cotton fields on this farm?

References: \_\_\_\_\_

Cotton farming in Australia is highly mechanised and cotton farmers use sophisticated machinery.

Where is the machinery shed to be found? References: \_\_\_\_\_

Cotton is grown as dryland cotton (relies entirely on rain) and irrigated cotton. Can you locate the irrigated cotton fields?

References: \_\_\_\_\_

Can you locate a dryland cotton field? References: \_\_\_\_\_

Did you know that just under half the area of a cotton farm is native vegetation? This area is cared for by cotton farmers.

Where might one area of native vegetation be located? References: \_\_\_\_\_

Aside from the rain, cotton farmers may access their water allocation through creeks, rivers, bores, dams or irrigation supply channels. They only grow cotton if there is water available. List the coordinates for the water sources seen on the map.

References: \_\_\_\_\_

See if you can categorise all the places found on a cotton farm into 'natural features' and 'built features'.

Natural features	Built environment features

Can you find the irrigation channel that supplies the irrigated part of the farm with its water? References: \_\_\_\_\_

Cotton farmers plant flowering refuges – crops like pigeon pea and conventional cotton in strips next to the cotton crop. Refuges are important as they prevent resistance to pest management strategies developing in insect populations.

Where is the refuge located? References: \_\_\_\_\_

Why do you think some of the fields are left fallow? References: \_\_\_\_\_

Why do you think there are no crops planted directly by the river? References: \_\_\_\_\_

Use the map to help you complete the key for the map.

Key:

J 6 \_\_\_\_\_

J 3 \_\_\_\_\_

F 7 \_\_\_\_\_

H 4 \_\_\_\_\_

D 5 \_\_\_\_\_

I 2 \_\_\_\_\_

B 3 \_\_\_\_\_

H 2 \_\_\_\_\_



### Explore a salmon farm

Some fish are farmed in pens in the ocean. In Australia these include Atlantic Salmon, Southern Blue Fin Tuna and Yellowtail Kingfish. Other fish such as Silver Perch and Barramundi, and prawns are grown in land-based ponds.

Salmon are bred and raised in freshwater hatcheries where they stay for about 15 months, at which stage they weigh about 75 grams. These juveniles, called smolts are then transferred in purpose-built trucks with water tanks to the sheltered “nursery” smolt site. Each pen for the smolt can hold about 50,000 fish.

They grow quickly and after six to nine months they have reached around 1.5 kg and are transferred to sea cages at grow out sites. These cages are further away from shore and are more exposed to ocean currents

Can you find the following places and locations on the map below?

Make sure you write the grid references down next to each question.

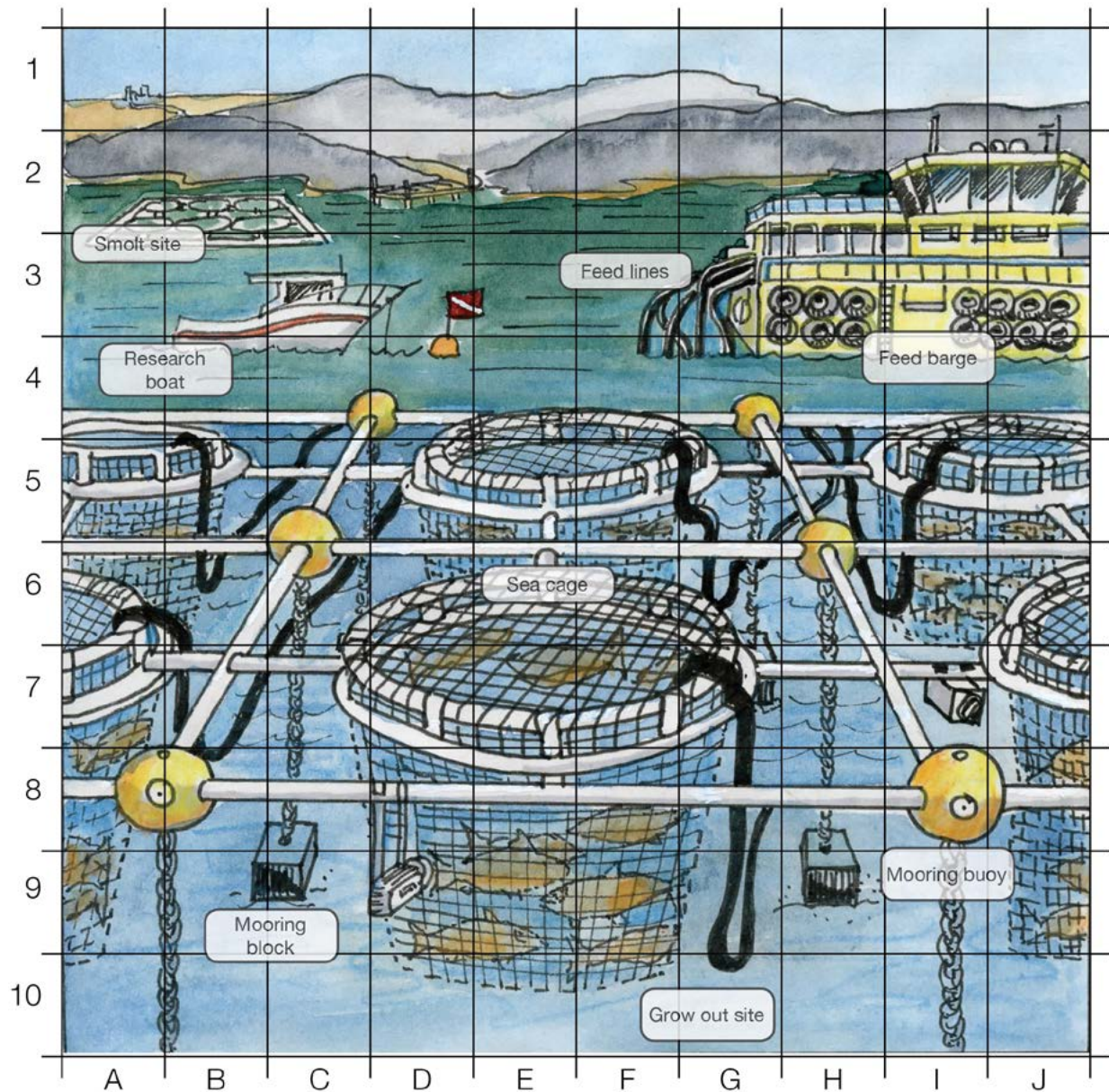


Illustration: Liz Grant, Designgrant

Look for the nursery smolt. Can you see it next to a jetty?

References: \_\_\_\_\_

Barges regularly travel between the farm work site and grow out site to carry workers and feed to the fish in the sea cages, and to bring harvested fish to shore.

Where can you locate the barge? References: \_\_\_\_\_

A feed barge is equipped with an automatic feeding system, which uses cameras to monitor when the fish are hungry and when they are full, and blows feed into the cages through feeding lines.

Where can you locate the underwater cameras? References: \_\_\_\_\_

Mooring buoys keep the sea cages floating in the sea. Where can you locate these? References: \_\_\_\_\_

Salmon farmers need to monitor the health of the environment. They also need to monitor the health and growth of their fish. A research boat is useful to allow farm staff and scientists to do their work.

Can you locate the research boat? References: \_\_\_\_\_

Can you find the flag signalling there is a diver in the water? References: \_\_\_\_\_

See if you can categorise all the places found on the salmon farm into 'natural features' and 'built environment features'.

Natural features	Built environment features

Use the map to help you complete the key for the map.

Key:

I 4 \_\_\_\_\_

E 6 \_\_\_\_\_

C 9 \_\_\_\_\_

F 3 \_\_\_\_\_

B 2 \_\_\_\_\_

E 2 \_\_\_\_\_



### Explore a cattle and sheep farm

In Australia, cattle and sheep can be farmed separately or together depending on the location of the farm and the preference of the farmer. Farms range in size from very large stations (usually in northern Australia) to smaller farms (usually in southern Australia). In Australia, there are 77,164 properties with cattle and 43,760 properties with sheep.

Source: Australian Bureau of Statistics, *Agricultural Commodities – Figures for 30 June 2012*

Tour the cattle and sheep farm and see if you can find the following places and locations on the map below.

Make sure you write the grid references down next to each question.

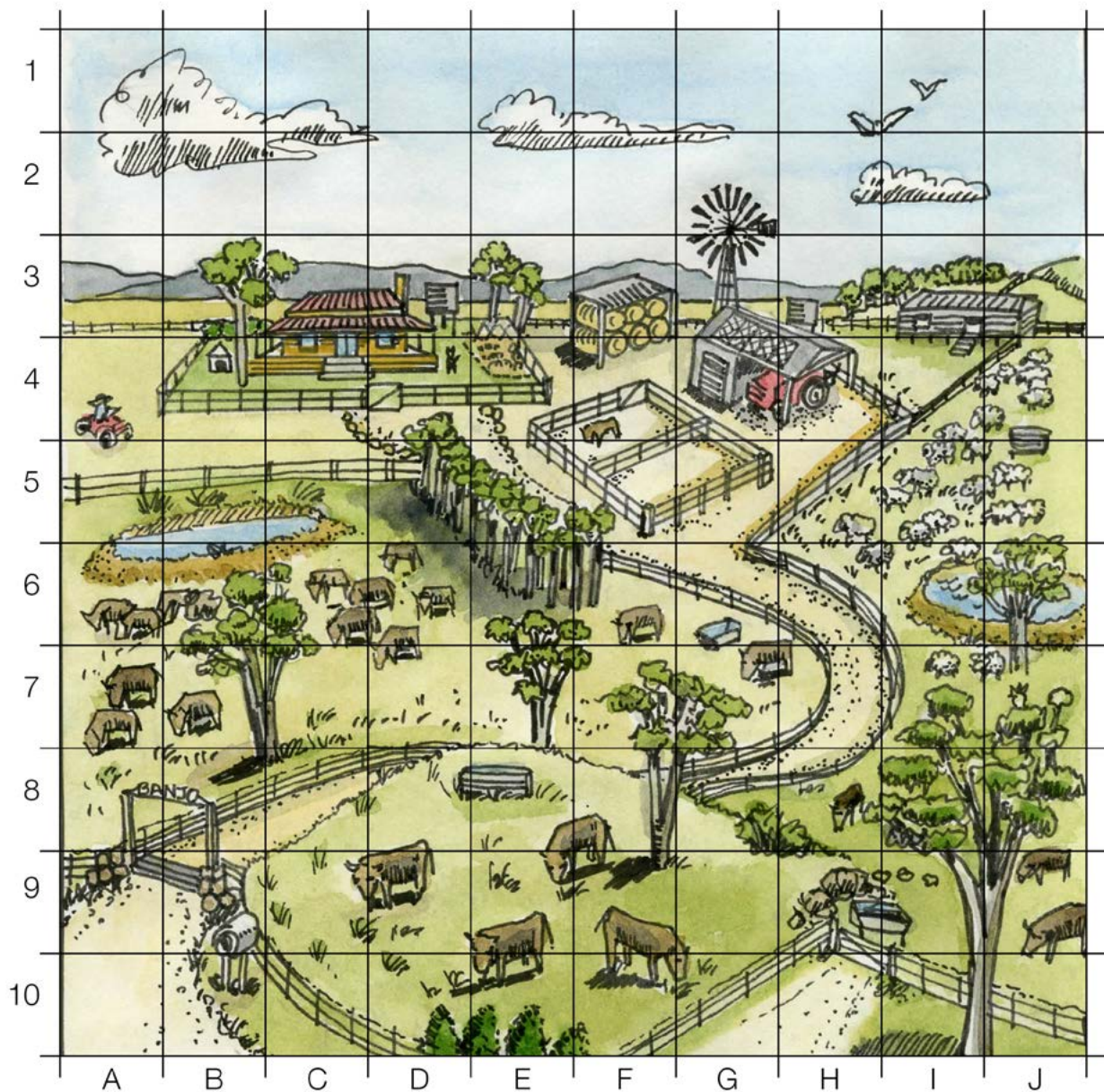


Illustration: Liz Grant, Designgrant

Can you locate the entrance to the farm saying the property name?

References: \_\_\_\_\_

Cattle and sheep farms have big paddocks with wire fencing. Can you find one close to a road?

References: \_\_\_\_\_

Most paddocks would contain a water trough and/or dam as well as plenty of natural trees and a planted tree line which provides shelter for the cows and calves and ewes and lambs. Where are a trough and a dam found?

References: \_\_\_\_\_

Is there a planted tree line anywhere to be seen?

References: \_\_\_\_\_

Can you find the machinery shed with a tractor?

References: \_\_\_\_\_

Where might the homestead with a water tank and dog kennels with a couple of dogs be found?

References: \_\_\_\_\_

Don't miss the shearing shed and sheep yards. Where are these located?

References: \_\_\_\_\_

See if you can categorise all the places found on the farm into 'natural features' and 'built environment features'.

Natural features	Built environment features

Use the map to help you complete the key for the map.

Key:

J 4 \_\_\_\_\_

F 3 \_\_\_\_\_

F 6 \_\_\_\_\_

G 6 \_\_\_\_\_

B 5 \_\_\_\_\_

B 9 \_\_\_\_\_

D 3 \_\_\_\_\_

G 4 \_\_\_\_\_

G 3 \_\_\_\_\_

B 4 \_\_\_\_\_



### Explore a plantation and native forest

Plantations are forests of trees which are planted to produce wood. Plantation forestry is like farming. In forestry, trees are the crop being grown to produce wood or timber.

Native forests are sustainably managed for a range of purposes including recreation, conservation of plants and animals and provision of timber.

Tour the sustainable forest industry map below and see if you can find the following places and locations.

Make sure you write the grid references down next to each question.

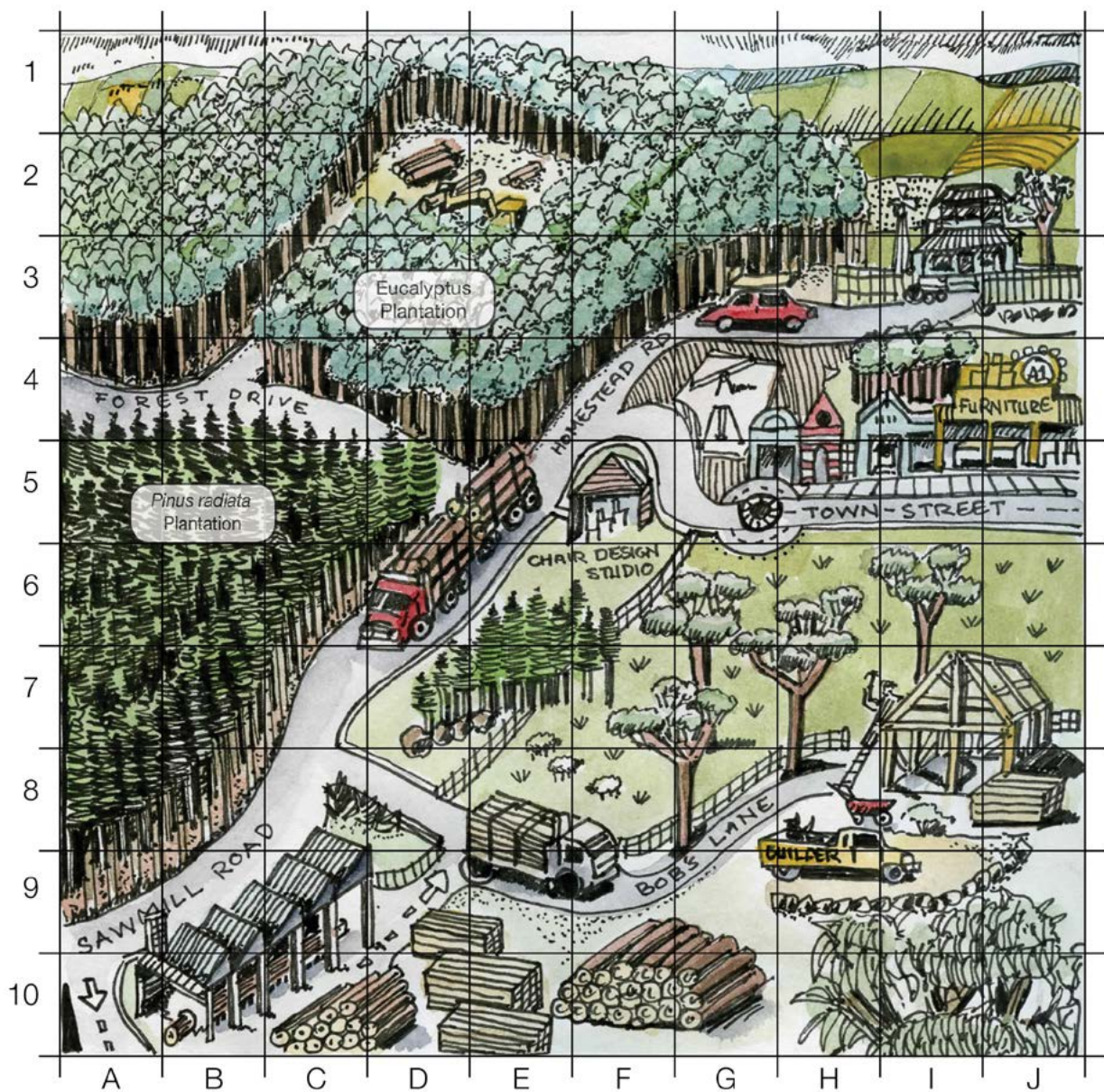


Illustration: Liz Grant, Designgrant

Can you find and reference the front of the logging truck that is going to the sawmill?

References: \_\_\_\_\_

Using the grid, find the fallen logs within the Eucalyptus forest and reference the equipment being used to lift and move the logs.

References: \_\_\_\_\_

Can you locate the builder putting up a wooden frame on a house?

References: \_\_\_\_\_

Name a built feature in the map that can be found at F5. \_\_\_\_\_

See if you can categorise all the places found on the map into 'natural features' and 'built environment features'.

Natural features	Built environment features

Use the map to help you complete the key for the map.

Key:

J 4 \_\_\_\_\_

J 3 \_\_\_\_\_

F 9 \_\_\_\_\_

G 4 \_\_\_\_\_

B 5 \_\_\_\_\_

I 2 \_\_\_\_\_

D 3 \_\_\_\_\_

H 8 \_\_\_\_\_

G 3 \_\_\_\_\_

B 10 \_\_\_\_\_

H 3 \_\_\_\_\_

E 10 \_\_\_\_\_



