



AN EDUCATIONAL UNIT FOR PRIMARY SCHOOLS



Exploring sustainable practices in food and fibre production

YEARS 5 & 6

Design and Technologies

primezone
The place for all your primary industry resources
www.primzone.edu.au

Contents

Introduction.....	3
About the approach	4
Teacher notes	5
Australian Curriculum content descriptions	7
Implementing the unit and activities in the classroom	8
Some questions and possible answers	10
Fast facts about Australian agriculture.....	11
National Farmers' Federation Farm Facts 2012.....	11
Meat and Livestock Industry	12
Fishing and Aquaculture Industry	12
Cotton Industry	13
Pork Industry	14
Forestry Industry	15
Step 1: Engage with the topic food and fibre production.....	16
Getting started	16
Step 1.2	20
Step 2: Explore where and how people produce food and fibre.....	21
Explore a chosen industry	21
Step 3: Explain the sustainable management practices	25
Explain the practices involved	25
Step 4: Elaborate on concepts and ideas.....	27
Presentation planning	27
Going further.....	28
Step 5: Evaluating	30
Produce, think back and evaluate	30
References.....	31
Resources	33
Resource 1.1.....	33
Resource 1.2.....	34

Cover photo courtesy
Forest & Wood Products Australia

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.

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 sustainable management practices in food and fibre production.

The material models how students can use a group task to investigate a range of primary industries that produce food and fibre in Australia and the sustainable management practices they use to do so.

This unit encourages students to use a range of digital texts and learning objects to investigate the technology and science contexts of five agricultural industries. In addition, the unit covers management practices used to ensure the growth and survival of crops, forests, fish, seafood and livestock on farm.

The unit also explores the idea that our primary industries can be part of the future by improving sustainability, adapting to climate change and producing quality food and fibre products.

The things they do, how they think, their ability to adapt and change their surrounding environment creates the context to help us understand the importance of our primary industries and our access to the freshest food and highest quality fibres.

As the unit progresses, the emphasis shifts to choosing a primary industry to research and create a persuasive TV ad or podcast. Students are encouraged to arrange a Skype, email, phone, or face-to-face interview with a member of the industry, and be part of the process of understanding, documenting and communicating the industry's opportunities and challenges in sustainable resource management practices.

Having explored some of the complexities of sustainable resource management practices in food and fibre production in the present in the early part of the unit, students then consolidate and present these understandings to an audience following the study.

Year levels: 5 and 6

Curriculum focus

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

- Investigate primary industries involved in food and fibre production, and where our food and fibres come from.
- Research how different foods including fish, seafood, pork, beef, goat, lamb and cotton seed oil are produced.
- Research how different fibres including timber and cotton are produced.
- Investigate concepts and ideas relating to the management practices used to produce food and fibre.
- Investigate concepts and ideas about land, water and energy management; revegetation; sustainable farming; climate adaptation; and sustainable resource management.
- Select ideas and undertake an inquiry.
- Create a persuasive TV ad or podcast.
- Reflect on and evaluate the success of the actions farmers are taking to produce quality food and fibre products.

Investigate management practices used to ensure the growth and survival of crops, forests, fish, seafood and livestock on farm.

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. Sustainability is the dominant cross curriculum priority. Design and Technologies learning area features strongly in the unit as the topics deal with the primary industries and management practices used to produce food and fibre. English, critical and creative thinking, and the Information and Communication Technologies are also featured strongly throughout the activities.

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.

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](#)

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 on 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 Years 5 & 6 in 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 also feature strongly as these methods develop important skills and ensure that the exploration of the topics are grounded in a relevant context.

Some You Tube 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 Years 5 and 6 level 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. 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. Work samples should be retained for this purpose.

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 (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



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 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°) 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 600–650g 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 food and fibre production

Getting started

Purpose

To provide students with opportunities to:

- gather information about their prior knowledge of where our food and fibre comes from
- develop skills in making connections between ideas
- help set directions for an investigation
- collate data for assessment purposes
- develop a focus for the forthcoming experiences in the 'Explore' stage of the inquiry.

Students develop an understanding of the places and resources used to grow food and fibre, and the sustainable management practices they use.

Introduction

Much of the food and materials our community rely on, started their journey as some form of agriculture. Whether it came from a forest, a fishery or a farm, there was a natural or managed ecosystem responsible for its growth.

Farms, fisheries and forests can be explored so that students develop an understanding of the places and resources used to grow food and fibre, and the sustainable management practices they use.

Initiate the inquiry



To initiate the inquiry **WATCH** and **LISTEN** to a range of stories about how foods are produced.

Check out how milk gets from the dairy farm to you at:

<http://splash.abc.net.au/media/-/m/30258/from-the-dairy-to-the-shop?source=search>

Find out what's involved in producing vegetables at:

<http://splash.abc.net.au/media/-/m/31158/growing-vegetables-and-natives?source=primary-science>

Investigate how honey is produced at:

<http://splash.abc.net.au/media/-/m/30267/how-do-apiarists-farm-their-bees-?source=primary-science>

Find out where bread comes from at:

<http://splash.abc.net.au/media/-/m/30303/where-does-bread-come-from-?source=search>

Find out how you might catch fish at:

<http://splash.abc.net.au/media/-/m/85888/ways-to-catch-and-eat-fish?source=primary-science>

Check out how rice gets to the supermarket at:

<http://splash.abc.net.au/media/-/m/30294/how-does-rice-get-to-the-supermarket-?source=primary-science>

Discover where your jeans come from and how cotton becomes fabric at:

<http://www.youtube.com/watch?v=cbKh1Xtfmao&list=UUcTsQcz7PRPX1bl3J3ORv-g&index=3>

Understanding terms

TALK with the students about the types of resources used by the farmers in their production processes i.e. water, soil, energy, pastures, animals, seeds etc. Ask questions about what it might mean to use these resources 'sustainably'? Check students' understanding of terms including 'sustainable management practices', 'sustainable use', 'sustainable water use', 'water conservation', 'sustainable energy use', 'energy conservation', 'waste management', 'food miles'.



As a class **IDENTIFY** and **DEFINE** terms which students are uncertain of. Once defined, ask the students to **EXPLAIN** the meanings of the terms to others.



Step 1: Engage with the topic food and fibre production

Explain the task

Note: This is a suggested assessment task.

EXPLAIN to the students that in this unit their challenge is to **RESEARCH** one primary industry, specifically the sustainable management practices they use in production. Your group will **CHOOSE** from the pork, beef or lamb meat; cotton or timber; fish or seafood industries.



Your group is encouraged to **EXPLORE** all aspects of the industry's web material; and where possible arrange a Skype, email, phone or face-to-face interview with a member of the industry to create a persuasive TV ad or podcast. Your group will then hold a press conference with an audience at the school, within the local community, to **SHARE** how the primary industry chosen is using improved sustainable management practices in the production of a food or fibre.



ASK students to consider the following questions:

- What do I know about primary industries?
- What do I know about the industries that produce beef and lamb?
- What do I know about the industry that produces pork?
- What do I know about the industries that produce fish and seafood?
- What do I know about the industry that produces cotton, cotton seed and cotton seed oil?
- What do I know about the industry that produces wool?
- What do I know about the industry that produces timber and timber products?
- How and where will we find out more about these industries?
- What does it mean to produce food and fibre using sustainable management practices?
- What does it mean to use resources in a sustainable way?



As a class or in groups **EXPLORE** the facts and figures of one Australian agricultural industry in the previous section *Fast facts about Australian agriculture*.



As a class **VIEW** a range of digital resources including:

National Farmers Federation Farm Facts for an overview of industry information.

See: http://prezi.com/qvn0y5hn6dfj/nff-farm-facts-2012/?auth_key=71f7fa088bd4d9e7ae6a0efbdb78079060191faa
or <http://www.nff.org.au/farm-facts.html>

Check out the diversity of Australia's fisheries, agriculture and forestry industries.

See: http://www.youtube.com/watch?feature=player_embedded&v=OSLNi8in2iU#!



Or **READ** a newspaper article about Australia's primary industries at:

<http://www.mercury.com.au/documents/GrowingforAustraliaMERC25JUL2012p50COPYRIGHT.pdf>

Or **HEAR** about young farmers in a range of primary industries at:

<http://archibullprize.com.au/yfc/ourteam.html>

Much of the food and materials our community rely on, started their journey as some form of agriculture.



Step 1: Engage with the topic food and fibre production



TALK about the different industries represented in the digital resources. List these for future reference.



DISCUSS which primary industries are known to produce food and fibre using sustainable management practices. What practices might they use? What methods might they use? Why?



If questions emerge from this activity, **RECORD** these and **DISPLAY** them for reference throughout the unit.

Concept mapping

Ask students to **DEVELOP** a concept map describing food and fibre production – what it is, what it comprises, what it needs, what it affects, why it’s important and potential impacts on environments and their natural resources.

Use Simple Mapper at: <http://simplemapper.org/?gclid=CLeDr8uA1bICFctDpgod6BsABg> or http://www.globaleducation.edu.au/verve/_resources/webmap.pdf



TALK about how farms supply our food and fibre needs and wants. **REVISIT** the task.

Explain to the class that they will be using a range of activities and digital resources to **DEVELOP** an understanding of:

- A primary industry.
- What it grows, farms, and produces.
- Where our food and fibre comes from.
- How the physical conditions of the farm, fishery or forest environment, and management practices used, might impact on production.
- Inform the students that they will also be encouraged to suggest ways to improve the farm, fishery or forest’s practices, so that there might be less impact on the environment.



Explain to the students that in this unit their challenge is to **RESEARCH** a primary industry that produces food and fibre, specifically the sustainable management practices they use to do so.

Their group will choose pork, beef or goat meat; cotton or timber; fish or seafood production.



Their group will **EXPLORE** aspects of the web material researched; where possible arrange a Skype, email, phone or face-to-face interview with a member of the primary industry and create a persuasive TV ad or podcast. The group will then hold a press conference with the Principal, school board and others to share how the primary industry is using improved sustainability practices in the production of a food or fibre.

Invite students to form groups and **CHOOSE** an industry to **RESEARCH**. Explain that they are to **CREATE** a written definition of their task and allocate individuals different tasks to undertake.

Describe food and fibre production – what it is, what it comprises, what it needs, what it affects, why it’s important and potential impacts on environments and their natural resources.



Step 1: Engage with the topic food and fibre production



Invite students to **CONSIDER** the following framework.

ASK questions like:



- What do we know about our chosen primary industry?
- How and where will we find out more about our chosen primary industry?
- What does it mean to produce food and fibre using sustainable management practices?



TALK with the students about the research task and the need to keep well presented records of all their thoughts, investigations and decision-making.

DISCUSS the importance of showing where they found their information. Invite them to **CONSIDER** the many suitable methods for recording, including:

- Photographs
- Drawings
- Notes
- Graphs
- Diagrams
- Recordings
- Computer graphics.



TALK with students about the need to keep a **LIST** of all the places that information has been found on the topic, and decide how to search through them.

TALK with students about responsible digital citizenship in online environments. Work with students to have them understand appropriate use. Introduce the principles:

- Respect themselves
- Protect themselves
- Respect others
- Protect others
- Respect intellectual property
- Protect intellectual property.

Invite students to **SIGN** a 'Digital Citizenship Agreement' defining their online behaviour.

Source: *Crockett, L. Jukes, I. & Churches, A. Literacy is not enough, page 81.*

For examples see: <http://hub.globaldigitalcitizen.org/download-gdc-agreements>

For more information about what a global digital citizen is see:

<https://globaldigitalcitizen.org/digital-citizenship-school-program/>

What does it mean to produce food and fibre using sustainable management practices?



Step 1: Engage with the topic food and fibre production

Invite groups to make a **PLAN** of action on how they might undertake the **RESEARCH** using the following headings.

What	How	When	Who and what's needed	How will we know if it worked

Step 1.2

Purpose

To provide students with opportunities to:

- gather information and analyse it for integrity, balance, visual presentation, clarity, principles of sustainable development
- record ideas and share with others.

Evaluating information



Explain to the students that during this unit of work, they will **READ** and **VIEW** a range of source materials. Sources could include web sites, YouTube videos, news articles, case studies, fact sheets and more.



DISCUSS with the class the importance of using reliable and accurate sources of information.



Ask students to begin using the rubric shown in **Resource 1.1**. in their learning journal to **RECORD** source materials used and to **EXAMINE** them for integrity, balance, visual presentation, clarity, principles of sustainable development etc.



Step 2: Explore where and how people produce food and fibre

Explore a chosen industry

Purpose

To provide students with opportunities to develop their understanding of:

- their chosen primary industry
- how farms, fisheries and forests use sustainable management practices
- how to frame questions
- how their investigations will be conducted.

Framing questions and actions



Encourage the students to **REFINE** their questions and **CLARIFY** how their investigations will be conducted. For example:

- Listing and categorising the information they will collect under headings – our primary industry and what they produce; actions they take to use sustainable management practices; solutions available today; emerging innovations/ inventions.
- Preparing a table to outline information that needs to be gathered, who is responsible, where they will seek information, and how it will be gathered. For example:

What do we need to do?	Who is going to do it and how?	How will we gather the information?	How will we present our findings?
Choose a primary industry to explore		Will we keep a wiki? Will we keep a learning log? Will we record all information? Will we meet twice a week to share what we have found?	Meet and discuss
Find out what it produces Record information and sources/ references	Web search Search YouTube Go to the library and search for information		Share information in written form
Find out its production methods Record information and sources/ references	Web search Search YouTube Go to the library and search for information		Flow charts
Find out if its production methods are sustainable Does it manage the resource(s) it needs to use to production? How? Does it have a 'tick of approval'?			Photos as evidence



Step 2: Explore where and how people produce food and fibre

RESEARCH TASK: PART 1



In assigned groups, invite students to focus on the relevant links for their chosen primary industry below as a starting point and **IDENTIFY**, **DESCRIBE** and **RECORD** the food or fibres produced in Australia by primary industries, and the sustainable management practices they use to produce food and fibre.

For Australian Cotton producers see:

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

http://cottonaustralia.com.au/uploads/publications/POCKET_GUIDE_-_FINAL.pdf

<http://www.youtube.com/watch?v=cbKh1Xtfmao&list=UUCtsQcz7PRPX1bl3J3ORv-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://www.youtube.com/user/FRDCFishfiles>

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

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

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

For Australian Oyster Farming see:

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

Develop a retrieval chart

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



Step 2: Explore where and how people produce food and fibre

RESEARCH TASK: PART 2

Remind students that the last part of their task is to, where possible, arrange a Skype, email, phone or in-person **INTERVIEW** with a member of the primary industry and **CREATE** a persuasive TV ad or podcast.



TALK with the students about the peak bodies for the different primary industries, namely cotton, cattle and sheep, pork, forestry and fisheries.

REVIEW the structure required when writing a persuasive text. **REMINDE** students that a persuasive text requires an introduction that lets the reader know what they are going to write and present about.

The **introductory paragraph** should:

- grab the reader’s attention by using a “hook” or key word that can be re-used.
- give an overview of the argument.
- close with a thesis statement that reveals the position to be argued.

The **body** of the persuasive text should:

- develop the intentions stated in the introduction.
- be communicated in paragraphs with each paragraph focusing on one piece of evidence. Each paragraph should also include supporting detail. Students might describe and list evidence; compare and contrast evidence or show cause and effect when presenting their arguments.

The **conclusion** of a persuasive text should:

- sum up your point of view and your reasons for your viewpoint so that the audience is convinced of your opinion.

INTRODUCE groups to the industry they are researching:

- Cotton Australia at: <http://cottonaustralia.com.au/>
- Meat and Livestock Australia at: <http://www.mla.com.au>
- Australian Pork Limited at: <http://australianpork.com.au/>
- Department of Agriculture, Fisheries and Forestry at: <http://www.daff.gov.au/>
- Fisheries Research and Development Organisation at: <http://frdc.com.au/>

Invite students to **CONTACT** the relevant media officer or education officer to assist locating detailed information about the sustainable management practices used in the industry to produce food or fibre.



Step 2: Explore where and how people produce food and fibre



Encourage students to:

- **CONSIDER** how best to communicate their findings. Will the tone of their work be serious or comical? Will it be dire, pessimistic, hopeful, or cautionary? Ask them to think about their audience and how they want them to react.
- **CONSIDER** the motives of the author(s) of the information gathered.
- **OUTLINE** a list of responses they would like their audience to consider. Do they want them to act? To think? To change their minds?
- **SEARCH** for inconsistencies or contradictions in their own narrative.
- **EVALUATE** information they have found that presents contrasting opinions. Should this be evident in their work? Do they want to show different viewpoints and compare them?
- **MAKE** judgements about how to deal with conflicting information.
- **REARRANGE** the information to reflect new patterns and ideas that might form the core of their narrative.
- **REDRAFT** their work to convey detailed information about their chosen primary industry and the findings from their investigations. Include a summary of appropriate action individuals can take to produce a food or fibre using sustainable management practices.





Step 3: Explain the sustainable management practices

Explain the practices involved

Purpose

To provide students with opportunities to:

- describe the sustainable management practices used to produce food or fibre
- identify the effect of these practices on the characteristics of the places and environments used to produce food and fibre sources; the people who buy the food or fibre; the economy and policies related to its production
- represent the processes involved in food and fibre production so that they can be communicated to an audience
- develop a storyboard.

Compass rose

TALK with the students about how all ideas and actions, or lack of ideas and action, carry a range of implications. Some can affect places/environment, people/society, economies and policies.



Then, **DRAW** a compass in the centre of the class's board, or use **Resource 1.2**, or access compass images from:

<https://www.google.com.au/search?q=compass+rose+worksheet&hl=en&prmd=imvns&tbm=isch&tbo=u&source=univ&sa=X&ei=plBzUKa7LMitiAeH4YCYAQ&sqj=2&ved=0CCOQsAQ&biw=1270&bih=544>

or: http://www.globaleducation.edu.au/verve/_resources/dev-compassrose.pdf

Instead of naming the four compass points north, south, east and west use:

- **N**atural environment/ ecological questions
- **S**ocial and cultural questions
- **E**conomic questions
- **W**ho decides? Who benefits? i.e. political questions

*Note: Diagonal points represent relationships between the four main points. For example, **NE** highlights ideas and questions about how economic considerations might impact on natural environments; **SE** highlights ideas and questions about economic considerations and people's lives.*



Using this 'compass' in nominated groups, **IDENTIFY** the environmental, social, economic and political factors that influence the chosen primary industry's sustainable management practices and how they might impact or affect the farm, fishery or forest; its food or fibre products; its budgets and consumer's perceptions.

COMPLETE this activity for all ideas to really understand all of the implications for their use and implementation on the farm, fishery or forest.



Alternatively use a flow chart to **LIST** a series of events that might happen, sequentially, as a result of the sustainable management practice. Other boxes could be added to show related events.

See: http://www.globaleducation.edu.au/verve/_resources/flow_chart.pdf for a template to use.

RESEARCH TASK: PART 3

Reflect on research



Ask students to **CONSIDER** how they are going to bring their information together and present it so that the main sustainable management practices involved in producing their chosen food or fibre can be communicated to an audience at the school, within the local community or via social media outlets like YouTube.



Step 3: Explain the sustainable management practices



As a class, **LIST** the main processes involved in production, and the main messages to be presented about primary industries and their sustainable management practices.



DISCUSS ways to share this information and ask students to decide on a way of presenting the information.

Decide on what to present and how to do so



Re-state the purposes of the investigation 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 the storyboard genre. Students now use the information they have gathered to construct a storyboard for the research being undertaken.

For ideas see: <http://www.slideshare.net/slayas/storyboard-genre-ideas>

Bringing it all together



Focus student's attention on:

- What we know.
- What we want to find out.
- What the class now knows.
- What other things we would like to find out.

Use 'What we know' as a source for class or small group discussion. Use the other prompts from the list above to plan the way forward.

See: <http://office.microsoft.com/en-au/templates/kwlh-chart-TC101887896.aspx>

List the main processes involved in production, and the main messages to be presented about primary industries and their sustainable management practices.



Step 4: Elaborate on concepts and ideas

Presentation planning

Purpose

To provide students with opportunities to:

- plan their presentation about a primary industry and its product/s
- discuss, evaluate and make decisions about their presentation type in groups
- develop skills of cooperative decision-making
- generate a personal and group list of ideas
- encourage sharing of ideas and to learn from one another.

Going further with the planning of the presentation



Invite students to **CONFIRM** the main message planned for their presentation.



In small groups, **DISCUSS** the possible ways to present the main message in an interesting and engaging format.



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.

Students work in groups, pairs or individually to create their presentation.

For more detailed video production lessons, have a look at this website below, which includes storyboards, scripting, shooting, editing and assessing. See: <http://kidsvid.4teachers.org/index.shtml>

Review and submit



Invite students to **REFLECT** on feedback shared in the earlier activity to revise and fine-tune the presentation.



Going further

Purpose

To provide students with opportunities to:

- analyse critically
- make links between their understanding and their experiences
- investigate practices in food and fibre production practices today
- describe probable, possible and preferred futures for food and fibre production in Australia
- write a script for a TV ad or podcast
- design or create production elements for a TV ad or podcast
- rehearse a TV ad or podcast.

Edward de Bono's Six Thinking Hats



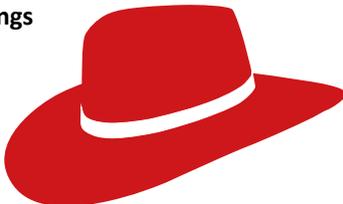
Invite students to **EXPLORE** any issues raised in their investigations using Edward de Bono's Six Thinking Hats technique. Students, in six groups, each with a different hat, discuss and document the issues according to their given perspectives, and then come together at the end to share ideas.

Issues might include:

- Do we love sustainable foods?
- Is sustainable food more costly? Why?
- Producing 'green' cotton means saving water, protecting soils, and reducing the use of pesticides to make a more sustainable product.
- While aquaculture has lots of economic potential, it can be unsustainable unless it is carefully managed.

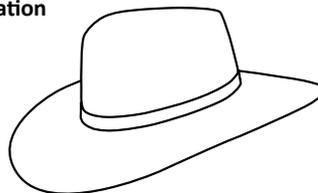
See example below.

Red Hat Feelings



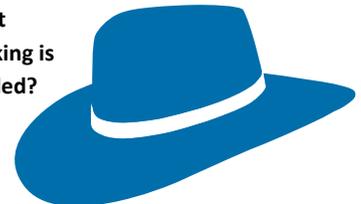
What are the emotions and feelings associated with food and fibre production practices?
How do you feel?

White Hat Information



List the facts that you know about food and fibre production practices and how they affect the environment.

Blue Hat What thinking is needed?



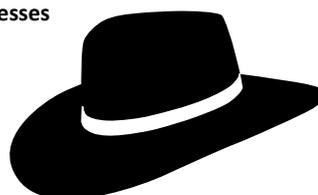
What has happened so far?
What should happen next?
What questions should we consider?

Green Hat New ideas



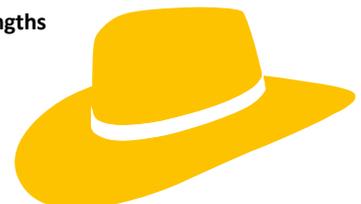
How could the problems related to the impact of production be solved?
What needs to be done?

Black Hat Weaknesses



What are some of the negative aspects and outcomes of food and fibre production practices?

Yellow Hat Strengths



What are some of the positive aspects and outcomes of food and fibre production practices?



Step 4: Elaborate on concepts and ideas

Explore futures

Take a 'futures walk' by envisioning new food and fibre production practices for the future. **TALK** with the students about:

- Possible futures
- Probable futures, and
- Preferable futures (hopes, dreams and visions).



Teachers may like to use a timeline and a current agricultural type/ industry, such as fish farming, to **DISCUSS** changes that have occurred in the past and present before considering 'the range of futures' that may be available to them.



Another idea might be to use a timeline to **EXPLORE** technologies involved in the production, processing and distribution of different foods. Include a range of past, present and emerging technologies that are being explored by farmers, such as: auto steering in tractors; the use of drones for crop monitoring; using capacitance probes to monitor crop watering requirements; the use of GPS systems in tractors; virtual fencing; and soil monitoring probes.



Encourage students to **FORMULATE** their own questions and then **ILLUSTRATE** and **DESCRIBE** their ideas for a possible, probable and preferable future in Australian food and fibre production. For example:

- A possible sustainable food future includes...
- A possible sustainable fibre future includes...
- A probable sustainable food future might include...
- A probable sustainable fibre future might include...
- I hope a preferable sustainable food future can include...
- I hope a preferable sustainable fibre future can include...

Discussing futures



Ask students to **TALK** about about issues for them, in relation to:

- Present sustainable food and fibre sources
- Possible sustainable food and fibre sources, and
- Probable sustainable food and fibre sources.



Expand on these thoughts and **ASK** students what might be done about these issues.



Synthesise ideas and invite students to **WRITE** a script for their TV ad or podcast using all ideas collected. Ask each group to **DESIGN** and **CREATE** the production elements for their format, rehearse, and if required **RECORD** the performances of the persuasive TV ad or podcast.

Take a 'futures walk' by imagining and envisioning new food and fibre production practices for the future.



Step 5: Evaluating

Produce, think back and evaluate

Purpose

To provide students with opportunities to:

- share the persuasive TV ad or podcast
- 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.

Deliver

Invite groups to share the persuasive TV ad or podcast.

Debrief

As a class have a discussion about their reaction to the different TV ads or podcasts.

Reflect

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

- Write about something new you learnt in this unit.
- How did you feel about the activities you undertook?
- What might you do differently if you were to do this again?
- How have my/our understanding about primary industries changed as a result of my/our learning?
- How well did I/we participate in any group learning activities?
- What questions do you have about the topic at the moment?

Assessment note

Learning logs are an ideal way to assist students reflect on their learning and provide a source of data for assessment. They can provide teachers with an insight into student's understanding and attitudes as well as, their perceptions of their own strengths and weaknesses.

References

- Australian Academy of Science (2005) *Primary Connections*, Canberra, Australia.
- Australian Council for Education Research (2011) *Food, Fibre and the Future: Report on surveys of students' and teachers' knowledge and understanding of Primary Industries*, Melbourne.
- Cecil, N. (1995) *The Art of Inquiry: questioning strategies for K-6 classrooms*, Peguis, Canada.
- Crockett, L., Jukes, I. and Churches, A. (2011) *Literacy is not enough. 21st Century Fluencies for the Digital Age*, 21st Century Fluency Project Inc.
- 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.
- Development Education Centre (1994) *Long Ago and Far Away*, DEC Birmingham.
- Gardner, H. (1985) *Frames of Mind: the theory of multiple intelligences*, Basic Books, New York.
- Gerber, T. (2006) *National Science Education Standards Correlated to Inquiry into Life* (Eleventh Edition), Online Learning Centre: Madder.
- Hamston, J. and Murdock, K. (1996) *Integrating Socially: units of work for social education*, Eleanor Curtin, 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 Broadcasting Corporation. ABC Splash

- <http://splash.abc.net.au/media/-/m/30258/from-the-dairy-to-the-shop?source=search>
- <http://splash.abc.net.au/media/-/m/31158/growing-vegetables-and-natives?source=primary-science>
- <http://splash.abc.net.au/media/-/m/30267/how-do-apiarists-farm-their-bees-?source=primary-science>
- <http://splash.abc.net.au/media/-/m/30303/where-does-bread-come-from-?source=search>
- <http://splash.abc.net.au/media/-/m/85888/ways-to-catch-and-eat-fish?source=primary-science>
- <http://splash.abc.net.au/media/-/m/30294/how-does-rice-get-to-the-supermarket-?source=primary-science>

Art 4 Agriculture. The Archibull Prize

- <http://archibullprize.com.au/yfc/ourteam.html>

Australian Curriculum Assessment and Reporting Authority. Australian Curriculum

- <http://australiancurriculum.edu.au>

Australian Forestry Standard

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

Australian Government Department of Agriculture

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

Australian Government Department of Agriculture. Australian Fisheries Statistics 2012

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

Australian Pork Limited

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

Australian Pork Limited. Aussie Pig Farmers

- <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>

Commonwealth of Australia Global Education Website

- http://www.globaleducation.edu.au/verve/_resources/webmap.pdf
- http://www.globaleducation.edu.au/verve/_resources/dev-compassrose.pdf
- http://www.globaleducation.edu.au/verve/_resources/flow_chart.pdf

Cotton Australia

- <http://cottonaustralia.com.au/>
- http://cottonaustralia.com.au/uploads/publications/POCKET_GUIDE_-_FINAL.pdf
- <http://cottonaustralia.com.au/cotton-classroom>

Creative Commons

- <http://creativecommons.org/licenses/by/3.0/au/deed.en>

References

Fisheries Research Development Corporation

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

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

Forest Learning

<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/>

Global Digital Citizen Foundation

<https://globaldigitalcitizen.org/digital-citizenship-school-program/>

<http://hub.globaldigitalcitizen.org/download-gdc-agreements>

Google

<https://www.google.com.au/search?q=compass+rose+worksheet&hl=en&prmd=imvns&tbn=isch&tbo=u&source=univ&sa=X&ei=plBzUKa7LMitiAeH4YCYAQ&sqj=2&ved=0CC0QsAQ&biw=1270&bih=544>

Kids' Vid

<http://kidsvid.4teachers.org/index.shtml>

Meat & Livestock Australia

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

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

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

Microsoft

<http://office.microsoft.com/en-au/templates/kwlh-chart-TC101887896.aspx>

National Farmers' Federation

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

Oysters Australia

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

Prezi. National Farmers' Federation

http://prezi.com/qvn0y5hn6dfj/nff-farm-facts-2012/?auth_key=71f7a088bd4d9e7ae6a0efbdb78079060191faa

Primary Connections

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

Simple Mapper

<http://simplemapper.org/?gclid=CLeDr8uA1bICFctDpgod6BsABg>

Slideshare

<http://www.slideshare.net/slayas/storyboard-genre-ideas>

Target 100

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

The Mercury Newspaper

<http://www.mercury.com.au/documents/GrowingforAustraliaMERC25JUL2012p50COPYRIGHT.pdf>

Wood Naturally Better

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

YouTube videos:

Australian Cotton Limited. ABC News - BMP Cotton By Sarah Clarke <https://www.youtube.com/watch?v=QgXPMFR6nqY>

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

Art4Agriculture. I Grow Cotton and You Wear It Says Richie Quigley <https://www.youtube.com/watch?v=2yEpXeBVvg4>

Australian Government Department of Agriculture. Farming for the Future https://www.youtube.com/watch?feature=player_embedded&v=OSLNI8in2iU#

Cotton Australia. The Australian Cotton Story Primary Version Update <http://www.youtube.com/watch?v=cbKh1Xtfmao&list=UUCtsQcz7PRPX1bI3J3QRv-g&index=3>

FishFiles YouTube Channel <http://www.youtube.com/user/FRDCFfishfiles>

Fisheries Research Development Corporation YouTube Channel. By-Catch reduction Devices Episode 8 <http://www.youtube.com/watch?v=V2ZHabeg3kw&list=PLC8B09244EFAEE63A>

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

Resource 1.1

The evaluation rubric: a guide to review source materials

Go through the following steps:

- Evaluate one source at a time
- Examine and discuss each source with a partner
- Use the rubric below for each source, filling in details to support your judgements.

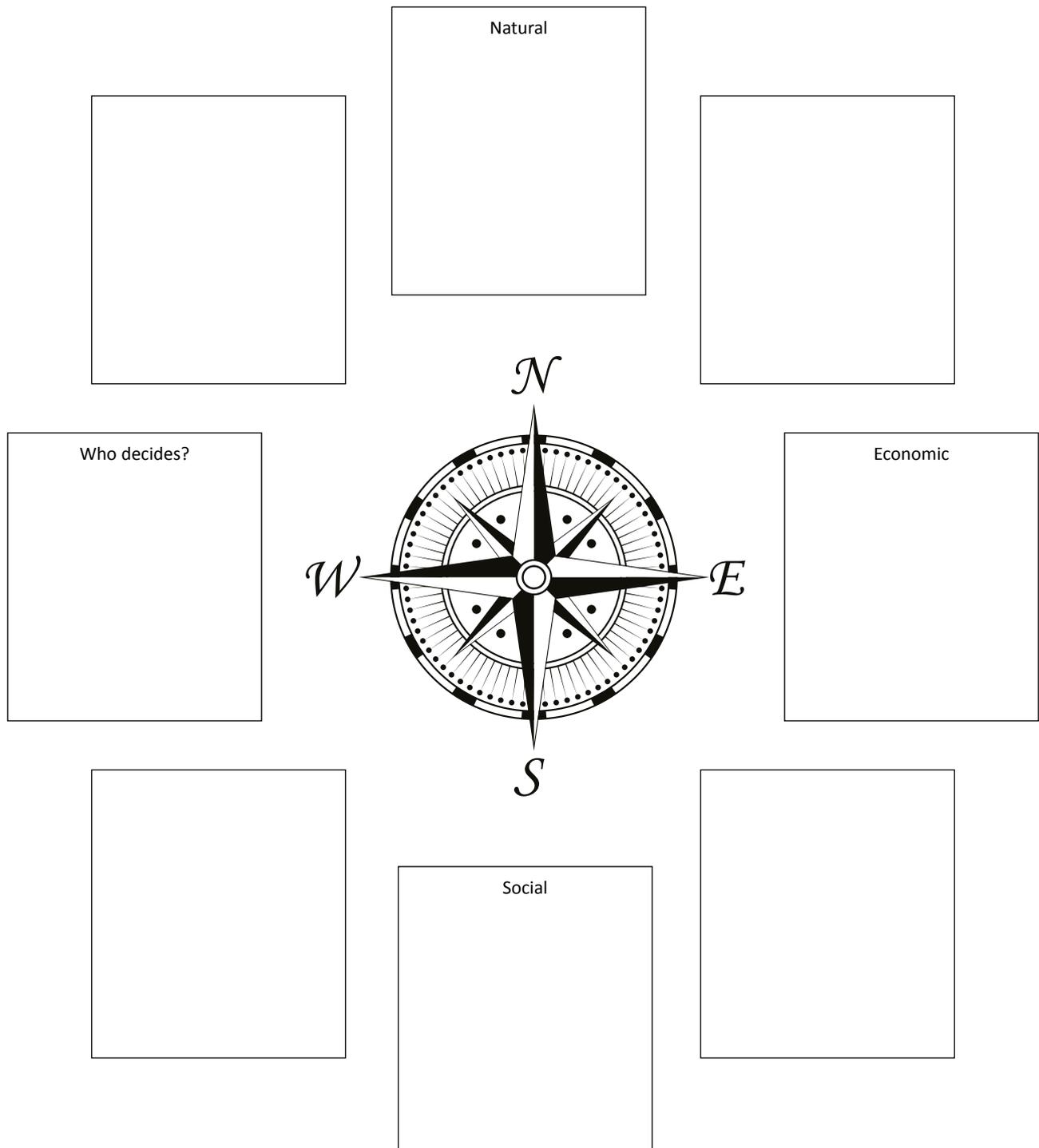
Resource title	Criteria	Not met	Adequate	Good	Exemplary
	The source increases knowledge and understanding of a primary industry.				
	The resource is engaging for an audience.				
	The resource has a clear purpose and is well organised.				
	The resource gives a balanced account of an issue, and accurately reflects the broad range of informed opinions on the subject.				
	The resource encourages the reader to ask questions.				
	The visual representations accurately depict the scientific concepts being examined.				
	The visual representations provide an alternative way for the reader to examine the concepts being discussed in the text.				
	Captions accompanying each visual representation follow the above criteria.				
Other notes					

These criteria are based on the official SB&F award criteria by Timothy Gerber. (2009). "Mock SB&F Prize for Science Books Election".

Resource 1.2

Compass rose

Use the compass rose to examine your chosen primary industry and its use of sustainable resource management practices from a variety of perspectives — the 'natural', 'economic', 'social' and 'who decides (power)'.



Source: *Long Ago and Far Away* ISBN: 0 948838 28 0



primezone
The place for all your primary industry resources
www.primetimezone.edu.au