



AN EDUCATIONAL UNIT FOR PRIMARY SCHOOLS



Investigating food and fibres

YEARS 3 & 4

Design and Technologies

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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 foods and fibres	16
Explore a range of foods and fibres.....	16
Step 3: Explain how technologies are used to produce foods and fibres	19
Step 4: Elaborate on concepts and ideas.....	22
Let's make and create.....	22
Step 5: Evaluating	23
Think back and evaluate.....	23
References	24
Resources	26
Resource 1.1	26

*Photo courtesy of Primary Industries
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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 unit encourages students to investigate how foods and fibres are produced. It includes sections on foods and fibres we use; how food and fibre are obtained; their production systems; and technologies and processes used to assist in their production and the contributions they make to societies.

As the unit progresses, the emphasis shifts to investigating how the family and cultural group students belong to produce different foods or fibre. Students interview a member of their family to obtain this information and in turn share recipes, ingredients, methods and equipment suggested by the families with the class.

Year levels: 3 and 4

Curriculum focus

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

- Investigate how foods and fibres are produced on farms.
- Investigate how food and fibre products are made.
- Investigate a range of technologies, materials, systems, tools and equipment used to produce food and fibre.
- Select ideas and undertake inquiries.
- Reflect on and evaluate what they know about how food and fibre is produced and the technologies, materials, systems, tools and equipment involved.

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.

Investigate a range of technologies, materials, systems, tools and equipment used to produce food and fibre.

Australian Curriculum content descriptions

Design and Technologies

Strand: Design and Technologies Knowledge and Understanding

Investigate food and fibre production and food technologies used in modern and traditional societies [ACTDEK012](#)

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.

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 3 and 4 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 3 and 4 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'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°) 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

Getting started

Purpose

To provide students with opportunities to:

- gather information about their prior knowledge of food and fibre production, and food and fibre technologies
- pool ideas and share with others
- assist students to organise the ideas they have about how some foods and fibres are produced
- share ideas about the contribution farmers make to society
- summarise ideas in texts.

Formally **ASK** the class if they have any questions and what they would like to find out about farms. **RECORD** the responses and display them, or establish a question box for students. **SHARE** students' questions and seek answers to them.

Brainstorm



BRAINSTORM ideas about how different foods and fibres are produced on farms. **LIST** key words and **CREATE** a flow chart to show links between them.

Personal responses



In small groups, find out what students now know about farms and what they produce. Encourage students to tell, **WRITE** or **DRAW** their ideas. Display these for future reference.

Each group reports to the class, synthesising ideas collated by the class. **DISPLAY** responses around the classroom.



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

Literature circles



Form literature circles with the task being to **SUMMARISE** a book about how some foods and fibres are produced. A suite of 16 e-Books can be selected by students from the Envirostories website and it's 'Our Farmers, Our Future' books.

See: <http://www.envirostories.com.au/stories/story-books/2012books-1/>



Working in small groups, ask students to find out more about how some foods and fibres are produced. Explain that each group can either, **WRITE** and **DRAW**, **RECORD** and **VIDEO**, or **DESIGN** and make a flow chart, of how the food or fibre product researched is produced.

Contributions the products make



Having explored how some foods and fibres are produced, **TALK** as a class about their uses, for example:

- Why might farmers raise sheep for their wool and meat? What are their uses?
- Why would farmers produce cotton?
- Why did the farmers in the story raise animals?
- What can growing cotton or wool provide?
- What might raising pigs, sheep, cattle, goats, chickens and bees provide?
- Which products can contribute to our needs and wants?
- How might they do this?



Step 2: Explore foods and fibres

Explore a range of foods and fibres

Purpose

To provide students with opportunities to develop their understanding of:

- foods and fibres used by people
- where some of our foods and fibres come from
- how farmers produce foods and fibres in different ways
- what happens to food from farm to plate
- what happens to fibres from farm to our homes
- contributions food and fibre production, and food technologies make to societies
- the subject matter and create a focus for the forthcoming experiences in the 'Explain' stage of the inquiry.

Introduce students to a range of foods and fibres.

At the table

SET UP a large wooden table with a cotton table cloth and a variety of fresh, processed, canned, pickled, frozen, dried, pasteurised, powdered and freeze dried food types. For example: fresh fruit and vegetables; pickled onions or gherkins; jar of jam; powdered milk; freeze dried coffee; dried herbs; peppercorns; rock salt; dried fruit; dried meat like beef jerky; eggs; bread; pasteurised milk; packet of rice or lentils; processed cheese; processed smallgoods; packet of sugar; can of fish etc.



TALK about the different foods and find out what students know about the production processes and technologies used to make them.

ASK questions like:

- What is the name of the food?
- How is it prepared?
- What might be required to prepare it?
- Who prepares it?



Distribute a large cut out circle representing a table to each student, and ask them to **DRAW** items they have on their tables at meal times.

At our tables



As a whole class, **COMPARE** and **CONTRAST** the foods drawn by the students. **RECORD** these in some way, for example a tally sheet, graph or Venn diagram.



TALK with students about what their records suggest.

ASK questions like:

- What can we say about the foods eaten by the class?
- What foods are not on our tables? Why? Why not?

Going beyond the table



TALK with the students about the range of technologies, materials, systems, tools or equipment that they think might have been used to produce some of the foods or fibres recorded in the earlier activity.

RECORD these for later use.



FIND out about the production processes used to make bread.

See 'Making Bread in a Factory' at: <http://splash.abc.net.au/media/-/m/30312/making-bread-from-flour>



After viewing **ASK** questions like:

- How is the flour changed into bread?
- What ingredients are added to the bread mixture?
- How did the cooking process change the bread mixture?



Ask students to **DRAW** a flow chart showing what happens after the delivery of flour has been made to the bakery.



Step 2: Explore foods and fibres



EXPLORE the production processes involved in growing and making a pair of jeans. See 'How to Grow a Pair of Jeans' at: <http://cottonaustralia.com.au/cotton-classroom/grow-a-pair-of-jeans>

ASK questions about the process of growing cotton and the production processes used to make denim.

Ask students to **DRAW** the steps involved (e.g. preparing the soil, planting the seed, watering the crop, maintaining a healthy crop, picking the cotton, sending the cotton by truck to the 'gin' where the cotton seed is separated from the fluffy cotton, exported overseas, spinning of the cotton, cotton yard is woven into fabric and sewn into jeans).



Take a good look at the foods that have been preserved using a 'technology', such as, the pickled onions, the jam, the dried fruit, and the frozen product. **DISCUSS** how these technologies have contributed to stopping foods from spoiling.



BRAINSTORM other known ways that foods are preserved by people and cultural groups.

Where some of our foods come from



As a class **VIEW** and **PLAY** a section of the interactive learning object 'Where do my meals come from?'

See 5–8 year old version: <http://www.foodafactoflife.org.uk/Activity.aspx?siteId=13§ionId=54&contentId=174>

See 8–11 year old version: <http://www.foodafactoflife.org.uk/Activity.aspx?siteId=13§ionId=54&contentId=175>

Then in groups **PLAY** both the 5–8 year old and 8–11 year old versions.



After playing the games **TALK** about where milk at breakfast time comes from...where ham in your sandwich comes from...where a steak, chop or sausage comes from.



IMAGINE a fish dinner, with potatoes, peas, carrots and beans.

THINK about the steps needed to get each of these food items.



CONSIDER a chicken salad, with lettuce, onions, tomato, carrots and herbs. **THINK** about the steps needed to get each of these food items.

PLAY the 'Farm to Fork Challenge'.

For 5–8 year old version, see: <http://www.foodafactoflife.org.uk/Activity.aspx?siteId=13§ionId=54&contentId=176>

For 8–11 year old version, see: <http://www.foodafactoflife.org.uk/Activity.aspx?siteId=13§ionId=54&contentId=177>

Find the correct stages for the different foods. **PLAY** both the 5–8 year old and 8–11 year old versions.



CONSIDER sausages – what are the stages in their production? **DRAW** these.



CONSIDER fresh fruit or vegetable snacks for recess. What are the stages in their production? **DRAW** these.

CONSIDER milk and cereal at breakfast time. What are the stages in their production? **DRAW** these steps.

Talk about the different foods and find out what students know about the production processes and technologies used to make them.



Step 2: Explore foods and fibres

Where some of our fibres come from



RECALL the Envirostories about cotton farms and sheep farms. **REVISIT** the fibres they produce. **INTRODUCE** another fibre like wood and play a similar game to 'Where our foods come from?' substituting fibres for foods. For example: Match the fibres you wear with where it originally came from.



CONSIDER a woollen jumper; a cotton shirt; a cotton T-shirt; a pair of jeans; a woollen beanie etc. Try: Match the fibre you use with where it came from.

CONSIDER a wooden desk; a leather bag; a rubber eraser etc.

Apply knowledge of the contributions food and fibre make



Encourage students to **THINK** of a follow-up activity to show their understanding of where a food or fibre comes from and the contribution they make to societies. For example: **CREATE** a display; **DRAW** a concept map; **ROLE PLAY**; or **CREATE** a mural.



Step 3: Explain how technologies are used to produce foods and fibres

Purpose

To provide students with opportunities to:

- explore some of the technologies used to produce foods and fibres
- explore if their family uses food technologies
- gather information about the topic
- develop the skills of formulating questions and gathering data
- develop communication skills: oral language and active listening
- develop the understanding of how we can learn from others
- develop a retrieval chart.

Approaches to producing some foods and fibres



REPLAY the 'Farm to Fork Challenge' games and investigate any technologies that are used to produce a food.

See 5–8 year old version: <http://www.foodafactoflife.org.uk/Activity.aspx?siteId=13§ionId=54&contentId=176>

See 8–11 year old version: <http://www.foodafactoflife.org.uk/Activity.aspx?siteId=13§ionId=54&contentId=177>



TALK about and **RECORD** the different technologies needed to produce foods. For example: What technologies might be involved in producing...

Challenges



Set a few challenges. Ask students in pairs or small groups to **INVESTIGATE** and **REPORT** back on how a food or fibre is produced, naming the technologies and processes involved.

Groups might choose from the following foods, fibres and possible resources:

Eggs: Check out the App 'Grab 'N Grade'.

See: <https://itunes.apple.com/au/app/egg-grab-n-grade/id580049277?mt=8>

Note this App is designed for both iPhone and iPad.

Milk: Play a Milk Interactive at: <http://www.dairy.edu.au/discoverdairy/learning-resources/interactives/milk-cycle>

Or find out how cows make milk for us at: <http://splash.abc.net.au/media/-/m/30240/why-do-cows-make-milk?source=primary>

Beef: View a YouTube video at: <http://www.youtube.com/watch?v=1KAPep35VMQ>

Lamb: View a YouTube video at: <http://www.youtube.com/watch?v=8bPc8zLVaH0>

Vegetables: Find out what's involved in producing vegies.

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

Honey: Find out more about producing honey.

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

Bush Foods: Check out: <http://splash.abc.net.au/media/-/m/105310/bush-food?source=search>

Bread: View a video to find out where bread comes from.

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

Cotton: View a YouTube video at: <http://www.youtube.com/watch?v=cbKh1Xtfmao&list=UUcTsQcz7PRPX1bl3J3ORv-g&index=3>

Timber: Check out the App Timber Sleuth.

See: <http://www.forestlearning.edu.au/Resources/timber-sleuth>

Different students could be rostered each day to give a brief **PRESENTATION** to the rest of the class about their chosen food or fibre. A large retrieval **CHART** detailing the information provided by can be added to during or after each presentation. This chart can be referred to throughout the unit.



Step 3: Explain how technologies are used to produce foods and fibres

What technologies, tools, equipment and systems are used to produce fresh vegetables?

More food technologies



Invite students to **INVESTIGATE** the types of food technologies used at home. For example:

- What technologies and tools might be used to grind coffee beans, peppercorns, cumin seeds, wheat or grains into finer particles?
- What technologies, materials, systems, and equipment might be used to preserve fresh fruits like peaches, apricots, cherries and pears?
- What technologies, tools, equipment and systems are used to produce fresh vegetables?
- What technologies, equipment, and systems might be used to make jam?
- What technologies, tools and equipment might be used to dry fruit?
- What technologies might be used to de-husk rice?



Explain to the students that they will be **EXPLORING** if their family produces foods or fibre at home, and if any technologies, materials, systems or processes, tools and equipment are involved.

Note that this can include: growing a herb; growing vegetables; growing fruit or nuts; preserving fruit; making jams; baking bread; pickling onions; making wine; making cheese; raising sheep, goats or alpacas for wool; growing a crop...



Explain that each student will **INTERVIEW** a family member to find this out.

Invite students to use the **RECORD** sheet in **Resource 1.1**.

Interviews

Ask students what they know about interviews and what they are used for.



VIEW or **LISTEN** to various interviews from television, radio, podcasts or YouTube videos. Ask students:

- What is the role of the interviewer?
- What was the role of the interviewee?
- How do you think they both felt?
- What information was the interviewer trying to gather?
- How effective were the questions?



Ask students to **DRAFT** a range of questions to interview family members about the foods they might produce and the technologies, materials, tools and equipment involved.

INVITE students to practice interviewing each other.

REHEARSE introductions and explanations. Ask questions like:

- How can we make the person feel at ease?
- How should we thank them?
- How will we record the information?



Encourage students to **BRAINSTORM** ways that they might present and communicate their interview findings.



Step 3: Explain how technologies are used to produce foods and fibres

Decide on what to present and how to do so



RE-STATE the purposes of the interview 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 in their research to **CONSTRUCT** a video or slideshow. See: <http://cooltoolsforschools.wikispaces.com/> for ideas.



Some students may instead choose to **WRITE** a recount of the interview; **PHOTOGRAPH** the food or fibre produced, and the technologies, materials, systems, tools or equipment used by the family; and **COPY** the family's favourite recipe or procedure.

Interview family members about the foods they might produce and the technologies, materials, tools and equipment involved.



Step 4: Elaborate on concepts and ideas

Let's make and create

Purpose

To provide students with opportunities to:

- produce a food or fibre
- share if their family produces any foods and how they do so
- apply what they have learned and communicate the foods produced
- plan their presentation
- share investigation findings.

Food science



Try producing a range of foods in the classroom. Try producing bread.

See: <http://www.csiro.au/helix/sciencemail/activities/Bread.html>

Make a fibre like honeycomb pumice.

See: <http://www.csiro.au/helix/sciencemail/activities/honeycomb.html>

Make mayonnaise.

See: <http://www.csiro.au/helix/sciencemail/activities/emulsion.html>

View the video at: <http://www.wikihow.com/Preserve-Food> and find out more about how you can preserve foods like cherry tomatoes in jars.

Fibre science



Contact Cotton Australia for a free *Cotton Sampler Education Kit*. It includes a seed planting kit; *How to Grow a Pair of Jeans* brochure; *Pocket Guide to Cotton* brochure; Cotton samples and Cotton retro stickers.

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

Find out more about how you can spin wool by hand.

See: <http://www.youtube.com/watch?v=gQM7YvzGl3Y>

Going further with the planning of the presentation



Invite students to **CONFIRM** their ideas 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



Invite students to **REVISE** and fine-tune their presentation. **CONSIDER** hosting a 'Showcase of Foods and Fibres' to present the students' work to the school community and beyond; or hold a tasting party!



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

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

- Write about something new that you learnt in this unit about ways foods and fibres are produced.
- What is one thing I have learned about my own values when it comes to farming?
- How might I help others know more about how farmers produce food and fibre?
- What have I learned about food technologies?
- What have I learned about the ways, materials, systems, tools and equipment required to produce foods and fibres?
- What would I still like to find out about food and fibre production?
- 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.
- 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.
- De Bono, E. (1992) *Six Thinking Hats for Schools, Books 1 & 2*, Hawker Brownlow Educational.
- 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 Splash

<http://splash.abc.net.au/media/-/m/30240/why-do-cows-make-milk-?source=primary>
<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/105310/bush-food?source=search>
<http://splash.abc.net.au/media/-/m/30303/where-does-bread-come-from-?source=search>
<http://splash.abc.net.au/media/-/m/30312/making-bread-from-flour>

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 Pork Limited
<http://australianpork.com.au/>

Cool Tools for Schools
<http://cooltoolsforschools.wikispaces.com/>

Cotton Australia
<http://cottonaustralia.com.au/>
<http://cottonaustralia.com.au/cotton-classroom/education-kits>
<http://cottonaustralia.com.au/cotton-classroom/grow-a-pair-of-jeans>

CSIRO: Science by Email
<http://www.csiro.au/helix/sciencemail/activities/Bread.html>
<http://www.csiro.au/helix/sciencemail/activities/honeycomb.html>
<http://www.csiro.au/helix/sciencemail/activities/emulsion.html>

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

Dairy Australia. Discover Dairy
<http://www.dairy.edu.au/discoverdairy/learning-resources/interactives/milk-cycle>

Envirostories
<http://www.envirostories.com.au/stories/story-books/2012books-1/>

Fisheries Research Development Corporation
<http://www.frdc.com.au>

Forest Learning
<http://www.forestlearning.edu.au/Resources/timber-sleuth>

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

References

Food a Fact of Life

Where do my meals come from (5-8 year old) <http://www.foodafactoflife.org.uk/Activity.aspx?siteId=13§ionId=54&contentId=174>

Where do my meals come from (8-11 year old) <http://www.foodafactoflife.org.uk/Activity.aspx?siteId=13§ionId=54&contentId=175>

Food to fork challenge (5-8 year old) <http://www.foodafactoflife.org.uk/Activity.aspx?siteId=13§ionId=54&contentId=176>

Food to fork challenge (8-11 year old) <http://www.foodafactoflife.org.uk/Activity.aspx?siteId=13§ionId=54&contentId=177>

Garnaut Climate Change Review

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

iTunes

<https://itunes.apple.com/au/app/egg-grab-n-grade/id580049277?mt=8>

Meat & Livestock Australia

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

National Farmers' Federation

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

Primary Connections

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

Wiki How

<http://www.wikihow.com/Preserve-Food>

Wood Naturally Better

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

YouTube videos:

Richard Goodwin. Wool spinning by hand <http://www.youtube.com/watch?v=gOM7YvzGI3Y>

Cotton Australia. The Australian Cotton Story Primary Version <http://www.youtube.com/watch?v=cbKh1Xtfmao&list=UUCtsQcz7PRPX1b13J3ORv-g&index=3>

NSW Department of Primary Industries. Where does our food come from? Beef <http://www.youtube.com/watch?v=1KAPep35VmQ>

NSW Department of Primary Industries. Where does our food come from? Lamb <http://www.youtube.com/watch?v=8bPc8zLVaH0>

Resource 1.1

Record sheet – What do I know?

Name:

My tasks: Find out if your family produces any food; and the technologies, materials, tools, equipment, systems or processes, recipes or instructions involved.

Interview a family member to find this out.

Write a sentence or two about what you know about each of the following:

What food(s) is/are produced by the family?

Foods produced are...

What technologies, materials, tools, equipment, systems, processes or recipes are involved?

My family...

My interview record

My interview questions:

My record of the interview:

[illegible]

My family's recipe to produce...

Title:

Ingredients:

Equipment needed:

How to produce

Step1:

Step 2:

Step 3:

Step 4:

Add more steps as you need!

