

FARM TO TABLE

STAGE 2-3
TEACHER GUIDE AND RESOURCES



Royal Agricultural Society of NSW



FARM TO TABLE

Primary School, Stage 2-3

TEACHER RESOURCES,
TEACHING & LEARNING
IDEAS



FARM TO TABLE INTRODUCTION

Primary School, Stage 2-3

TEACHER RESOURCES, TEACHING & LEARNING IDEAS

The aim of the Incursion Program is to give students a hands-on experience with agriculture in safe surroundings. The following Resources, Teaching & Learning Ideas are supplied as a guide to help teachers with relevant resources to use in the classroom. Teachers can view and print pages, use themes for STEM projects and access up to date information with links to quality Australian Agriculture Industry education web sites as well as suggested international sites.

THE FOLLOWING ICONS WILL BE USED THROUGHOUT:



BRAINSTORM/
WHOLE CLASS
DISCUSSION



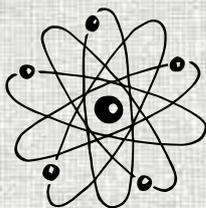
RESEARCH/VIEW/
VISUAL LITERACY



RESPOND



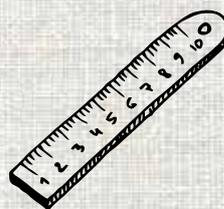
READ



SCIENCE

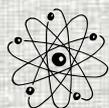


MATH



ASSESSMENT

STEM



STEM-S Science



STEM-T Technology



STEM-E Engineering



STEM-M Math

DISCLAIMER: The information contained in this publication is gathered for the purpose of guiding teachers in the Farm to Table Incursion and providing them with relevant resources to give students a hands-on experience in safe and familiar surroundings. The information is, in-part, a compilation of information provided by third parties and the RAS does not warrant its accuracy and advises that any such information may be subject to change or amendment occurring at any time and thereby making the information incorrect. Subject to the RAS' legal obligations and responsibilities. If you require confirmation of any information please telephone the Senior Agricultural Education Co-ordinator responsible for the particular information or the RAS switchboard on (02) 9704 1494

Targeted NSW Syllabus Outcomes in RED	Targeted Australian Curriculum in BLACK	<h1 style="text-align: center;">FARM TO TABLE THEMES & OUTCOMES</h1>		
GROUND WORK	THE EVENT	THE END PRODUCT	WHAT HAPPENS ON A FARM	METRO, RURAL OR REMOTE
WHAT DOES A FARM & A TABLE HAVE IN COMMON? Brainstorm prior knowledge & students interests English EN2-1A; EN3-1A Page 12	HAND WASH HIGH 5 Personal Hygiene Safe Living SLS2-13; SL3-13 Page 20	WHAT'S ON YOUR TABLE? Breakfast audit and where's it from? Design & Production ST2-3DP-T; ST3-3DP-T Page 22	A DAY IN THE LIFE OF A FARMER Flow chart activities in a dairy & compare with your day. Living World ST2-5LW-T; ST3-5SW-T Page 27	STORIES FROM MELBOURNE & COUNTRY QUEENSLAND View & discuss student attitudes about where they live. Geography GE2-2; GE3-3 Page 30
WHERE'S AGRICULTURE? Showcasing by-products in Agriculture Scientific Thinking, English EN2-8B; EN3-3A Page 13	CAN I ASK A QUESTION? Create questions to ask at Event English EN2-1A; EN3-1A Page 20	FIBRES WE LIVE WITH Explore daily uses of natural fibres Material World ST2-7MW-T; ST3-7 Page 22	WHAT KEEPS A FARMER BUSY? Time in Motion study Maths: Time MA3 1WM; MA2 1WM Page 27	COUNTRY VERSES CITY LIFE Compare & contrast lifestyles Geography GE2-2; GE3-2 Page 30
DO YOU KNOW YOUR SOWS FROM YOUR COWS? Farm animal literacy Living World ST2-4LW-S Page 14	EVENT: PRESENTATION Speaking, listening and questioning. English EN2-1A; EN3-1A Page 20	PACKAGING INFORMATION AND COUNTRY OF ORIGIN Understanding data & the global food market Design & Production ST2-3DP-T; ST3-3DP-T Page 23	QUIET, THE WEATHER REPORT IS ON TV! Understanding farmers' point of view English EN2-7B; EN3-6B ACELY1676; ACELY1698 Page 28	THE BACK OF BOURKE OR THE ROAD TO GUNDAGAI Mapping access to services across NSW Geography GE2-4; GE3-4 Page 31
IS THAT AN ARTICHOKE OR CUSTARD APPLE? Fruit & Veg literacy Living World ST2-4LW-S Page 14		KITCHEN AUDIT Investigate hidden additives, sugar & fats Healthy, Safe and Active Lifestyles PD2-7; PD3-7 Page 23	IT NEVER RAINS BUT IT POURS Exploring weather & growing a good crop Earth & Space ST2-10ES-S; Living World ST3-4LW-S Page 28	SAY G'DAY TO A FARMER Connect with farmers in different regions in NSW Geography GE2-2; GE3-3 Page 31
ARE THEY VEGETABLES OR FRUIT? Classify & Grouping Living World ST2-4LW-S Page 15		THE COST OF FOOD Balancing budgets. Maths MA2-2WM; MA3 2WM Page 24	SEASONS FOR YOUR SALAD IN NSW Create seasonal calendar & map growing regions of NSW Living World ST3-4LW-S Page 29	FEATURES OF REGIONS IN NSW Research NSW geographical elements & climates Geography GE2-3; GE3-3 Page 31
THE LANGUAGE OF AGRICULTURE Glossary English EN2-5A; EN3-4A Page 15-16		STORING FOOD PRODUCTS Investigation with temperature focus Scientific Investigation ST2-1WS-S; ST3-1WS-S Page 24	CROP ROTATION Create a 3 year planting guide for a garden Living World ST2-5LW-S Page 29	STEM PROJECT Create a Farm Holiday Page 32
JOBS THAT WOULDN'T EXIST WITHOUT FARMS People in Agriculture Work & Enterprise GE3-2 Page 17		WHOLEFOODS VERSES PROCESSED FOODS Investigate what's in your bread Personal Health PH2-12; PH3-12 Page 24	STEM PROJECT Create a Garden Bed Page 29	
FARMER 'SAY CHEESE' Stereotypes Health, Wellbeing and Relationships PD2-10; PD3-10 Page 18		WHAT'S IN YOUR BREAD Taste test and categorise before Investigating additives Living World ST2-1WS-S; ST3-1WS-S Page 25		
		STEM PROJECT Build a Chook House Page 26		

FARM TO TABLE THEMES & OUTCOMES

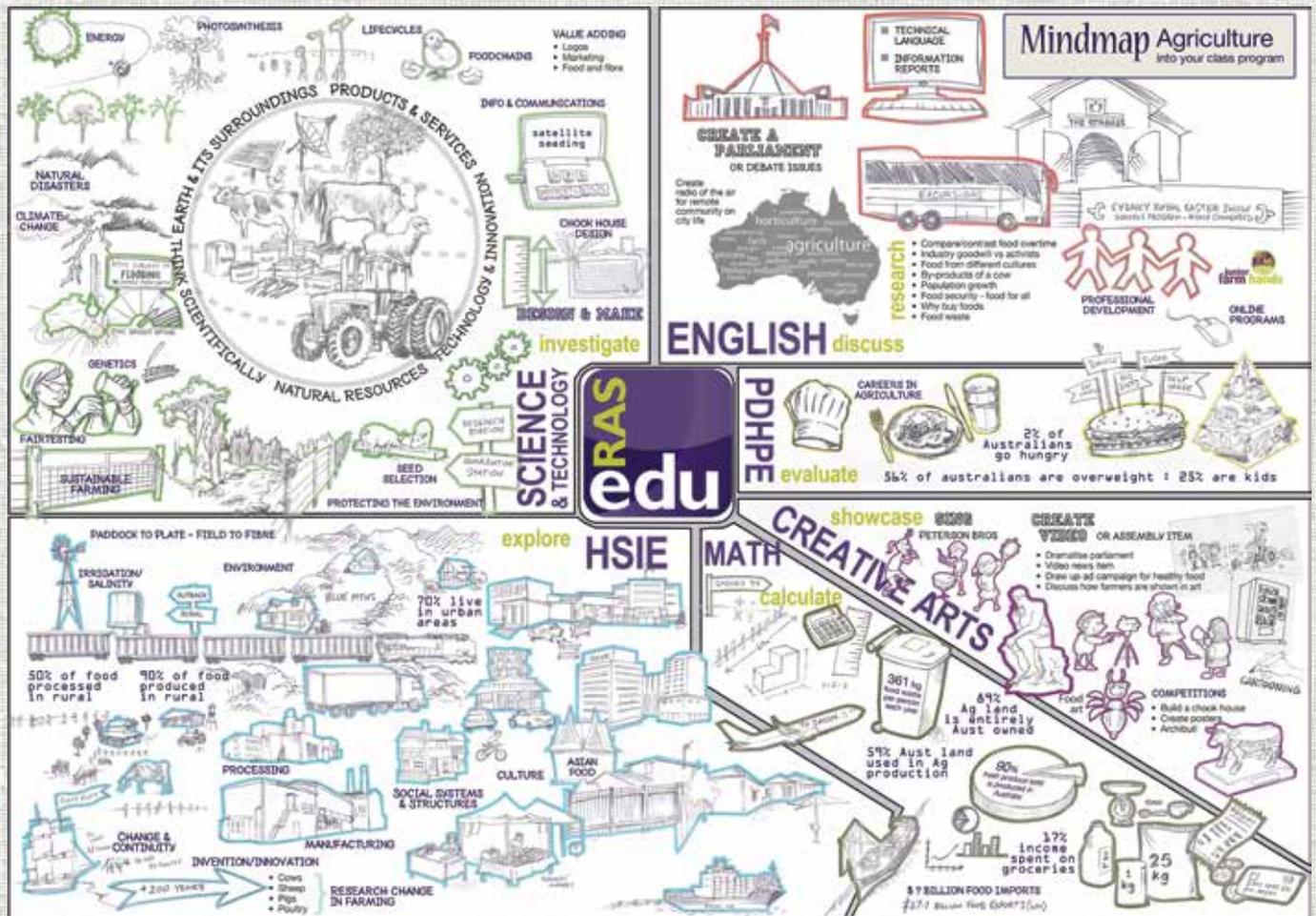
MANAGED ENVIRONMENTS: LIVESTOCK & CROPS IN NSW	PROCESSING: TRANSFORMING & VALUE ADDING	AGRICULTURE: THE JOB DESCRIPTION	MANAGING THE RISK OF FARMING	FARMING: THE BIG QUESTIONS
WHAT IS PRIMARY PRODUCTION IN NSW? Research distribution of livestock and crops in NSW Living World ST2-5LW-T; ST3-5LW-T Page 33	WHAT IS FOOD PROCESSING? Explore food processing in the home to learn the basics of transformation. Living World ST2-5LW-T; ST3-5LW-T Page 38	WORKING IN AGRICULTURE Create a job advertisement for a Jillaroo or Jackaroo English EN2-7B; EN3-5B Work and Enterprise Page 43	CAUSE & EFFECT OF FARMING RISKS Brainstorm & discuss possible risk of farming and outcomes Safe Living SL2-13; SL3-13 Page 48	WHY IS IT IMPORTANT TO GROW FOOD AND FIBRE SUSTAINABLY? Unpacking what sustainability means. Working Scientifically ST2-1WS-S; ST3-1WS-S Page 52
WHAT IS A MANAGED ENVIRONMENT? Identify sustainable farming practices and show on a farm map Living World ST2-5LW-T; ST3-5LW-T Page 33	WHY DO WE PROCESS FOOD? Scientific Investigation: Extending the life of apples Working Scientifically ST2-1WS-S; ST3-WS-S Page 39	THERE'S NO PIZZA DELIVERY OUT HERE! Design a survey to match people to a job in agriculture Geography GE2-2; GE3-3 Page 43	HOW ARE SMALL TOWNS AFFECTED IN A BAD SEASON? Create & film a short parody to show the risks in farming English EN2-6B; EN3-8D Page 48	BIODIVERSITY Investigate global staple foods Living World ST2-5LW-T; ST3-5LW-T Page 53
HOW DOES SOIL AND CLIMATE AFFECT FOOD GROWTH? Scientific Investigation to determine best growing medium for a salad green Working Scientifically ST2-1WS-S; ST3-1WS-S ACSSU073 Page 34	PROCESSING NUTRIENTS Value Adding with nutrients Living World ST2-5LW-T; ST3-5LW-T Page 39	DO YOU KNOW A JILLAROO FROM A JACKAROO? Create a study plan for your chosen job in agriculture Work and Enterprise Page 45	FARM SAFETY FOR KIDS Research common accidents on farms and support services to help Safe Living SL2-13; SL3-13 Page 48	GLOBAL FOOD SECURITY Farming food for our growing population. English EN2-8B; EN3-2A Page 53
THE GRAIN HARVEST Research and compare growing grain in 1900s and now to investigate sustainable practices Living World ST2-5LW-T; ST3-5LW-T Page 35	PROCESSING THE BASIC INGREDIENTS Create flow chart of a fast food, labelling each process to show how & why transformed Living World ST2-5LW-T; ST3-5LW-T Page 39	CLOSE YOUR EYES AND PICTURE A FARMER Design a clothing range for jobs in agriculture Material World ST2-7MW; ST3-MW-T Page 45	WHAT IS BIOSECURITY? Research hand hygiene & create posters to educate others Safe Living SL2-13; SL3-13 Page 49	GLOBAL WARMING & CLIMATE CHANGE Looking at different points of view on current issues. English EN2-11D; EN3-8D Earth & Space ST2-1OES-S Page 54
SPECIALISED FARMS: FISH FARMING/AQUACULTURE & GREENHOUSES Research a variety of farms across NSW. Geography GE2-3; GE3-3 ACTDEK012 Page 35	FOOD PROCESSING IN AUSTRALIA Investigate what food is manufactured in NSW Living World ST2-5LW-T; ST3-5LW-T Page 40	200 YEARS OF FARMING IN AUSTRALIA The evolution of technology in agriculture History HT2-1; HT3-1 Page 46	CAN I GET SICK FROM AN ANIMAL? Investigate biosecurity measures at an egg farm Safe Living SL2-13; SL3-13 Page 50	FOOD MILES Local farmers markets and the supply of 'out of season' fresh produce. Sustainability, Material World ST2-7MW-T; ST3-1OMW-T Page 54
LIFE CYCLES Explore patterns and anomalies in life cycles Living World ST2-5LW-T; ST3-5LW-T ACSSU072 Page 36	NOTHING IS LEFT TO WASTE Create an infographic showing by-products of one product English EN2-7B; EN3-5B Page 41	INNOVATION & KEEPING EVERYTHING GREASED, OILED & OPERATING ON A FARM Explore innovation in farming History HT2-2; HT3-2 Page 46	IS THAT A WEED OR A PLANT? Investigate how weeds were introduced & spread Working Scientifically ST2-1WS-S; ST3-1WS-S Page 51	FOOD QUALITY & THE IMPERFECT CROP Research how natural disasters can affect agriculture Earth & Space ST2-1OES-S; ST3-1OES-S Page 55
WAS IT ALWAYS GROWN IN NSW? Research Aboriginal traditional food source and discover how agriculture has changed over time History HT2-4 Page 36	WE'RE GETTING FATTER Mill brown rice to make white rice & bran to explore health benefits Personal Health PHS2-12; PHS3-12 Page 42	HOW DOES THE USE OF TECHNOLOGY HELP FARMERS? Exploring the digital age of managing a farm Living World ST2-5LW-T; ST3-5LW-T ACTDEK012 Page 47	STEM PROJECT Seed Design Page 51	FOOD WASTE Case Study: Oz Harvest Sustainability Page 55
STEM PROJECT Design a Greenhouse Page 37	STEM PROJECT Create a Balanced Meal Page 42	STEM PROJECT Designing a Farm Tech Page 47		URBAN FARMING Look at trends of rooftop gardens and bee hives History HT3-3, Living World ST2-5LW-T; ST3-5LW-T Page 56
				STEM PROJECT Design & Make a Farm to Table Board Game Page 57

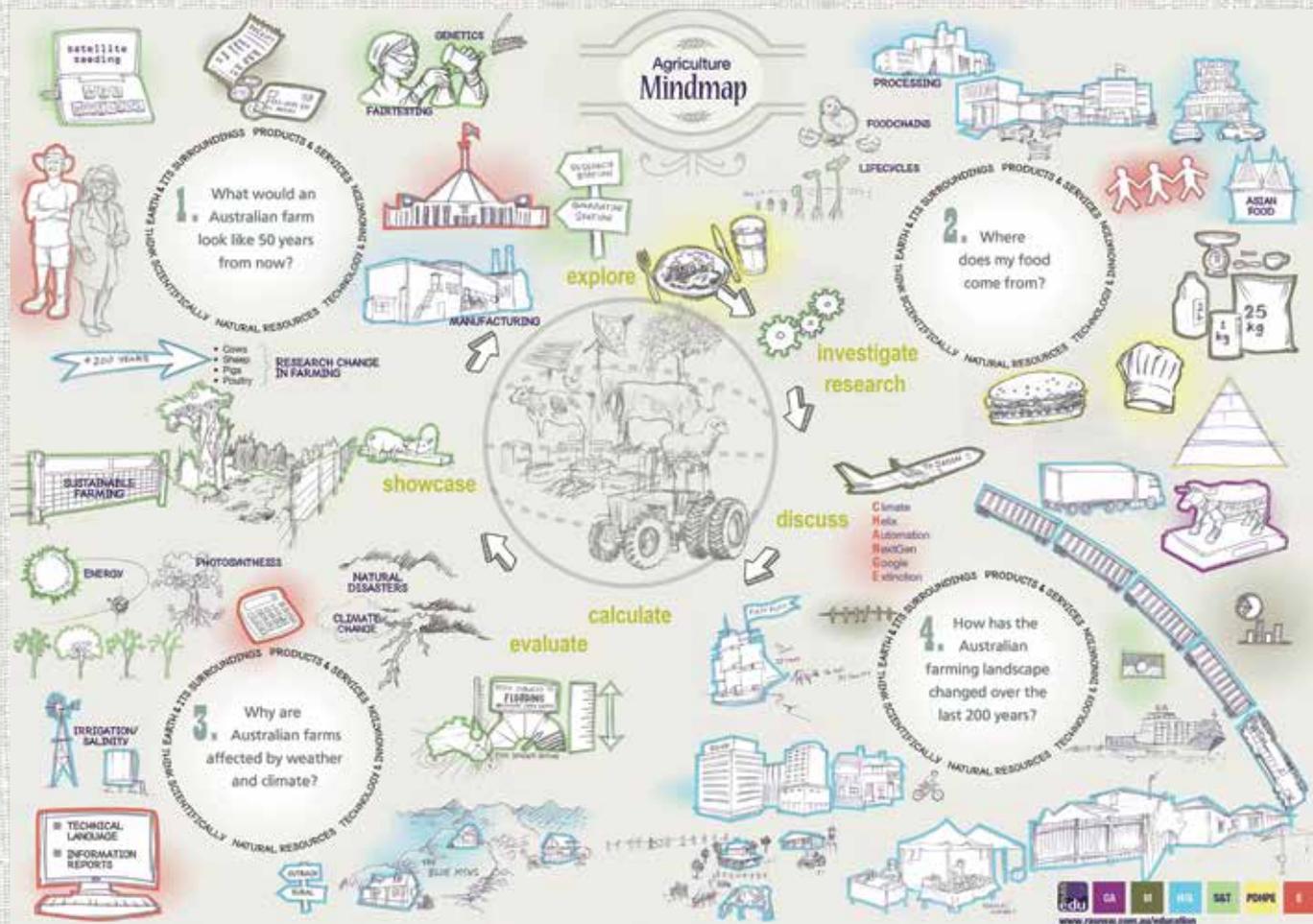
MINDMAP AGRICULTURE INTO YOUR CLASS PROGRAM

Agriculture with its Paddock to Plate and Field to Fibre stories is not just for the science lesson. Agriculture is the basis for a great **STEM PBL program** with clear links to all Key Learning Areas. Use the **Mindmap Agriculture** to see the links and build cross curriculum programs that challenge students to work on a project that begins with a question without a clear answer. Start by looking inside the circle to choose anything farmed for commercial use in NSW and create links with Science, Technology and Math themes. Find the Engineering from STEM in the Design & Make process to complete the project. Create the question anywhere along the value chain; production, processing & manufacturing, researching and developing, transporting, marketing, packaging, preparing or consuming. Four suggestions illustrated on the second **Agriculture Mindmap** are;

1. What would an Australian Farm look like in 50 years from now?
2. Where does my food come from?
3. Why are Australian farms affected by climate and weather?
4. How has the Australian farming landscape changed over the last 200 years?

DOWNLOAD MINDMAP AGRICULTURE
<http://www.rasnsw.com.au/education>





STEM PRINCIPALS

For quick access to support STEM in the classroom, visit the NESA website or the ACARA website both linked below;

SUGGESTED RESOURCES:

NESA: <http://educationstandards.nsw.edu.au/wps/portal/nesa/k-10/understanding-the-curriculum/programming/stem-support>

ACARA: <http://www.acsa.edu.au/pages/images/Australian%20Curriculum%20Technologies%20and%20STEM%20connections.pdf>

RASEDU PRODUCE TO PRODUCT POSTERS

A series of eight posters in Dairy, Fruit, Sugar, Grain, Vegetable, Red Meat, Poultry & Aquaculture highlight a few key on-farm activities, followed by off-farm processing to become a series of retail products. Each poster identifies a number of jobs including those on farm, during processing and selling, to marketing the end product. Each poster spotlights some of the issues associated with that industry.

DOWNLOAD POSTER SERIES

<http://www.rasnw.com.au/education>

DAIRY

Topics

Jobs

Produce

TYPES OF DAIRY COWS

- ✦ Holstein
- ✦ Friesian
- ✦ Jersey
- ✦ Brown Swiss

Cows are milked two times daily.

- ✦ Climate Change
- ✦ Seasons
- ✦ Weather
- ✦ Sustainability
- ✦ Food Security

- ✦ Dairy Farmer
- ✦ Vet
- ✦ Fencer
- ✦ Soil Scientist
- ✦ Cow Nutritionist
- ✦ Mechanic

The Process

- ✦ Food Miles
- ✦ Energy Use
- ✦ Irreversible Change
- ✦ Technology

Raw milk undergoes a series of operations in order to change or preserve it

- ✦ Truck Driver
- ✦ Factory Worker
- ✦ Scientist
- ✦ Marketer
- ✦ Retailer
- ✦ Mechanic
- ✦ Boiler Maker
- ✦ Fork Lift Driver

The Product

Baseballs are made from Holstein hides!

On average each Australian drinks 106 litres of milk and eats 13 kilograms of cheese every year

- ✦ Nutrition
- ✦ Food Waste
- ✦ Budget
- ✦ Change

- ✦ Chef
- ✦ Home Cook
- ✦ Retailer
- ✦ Restaurant Owner



TEACHER & STUDENT RESEARCH LINKS

RASNSW have created a selection of links to information and activities on websites that are safe for students to visit and navigate for researching agriculture. There is a focus on Australian sites and they are categorised by topic to further streamline the search process.

DOWNLOAD RESEARCH LINKS

<http://www.rasnsw.com.au/education>

Agriculture
English / HSE / S & T

Research

RAS NSW Primary Schools Program suggested websites, books and YouTube sites for student and teachers research opportunities.

General	Department of Primary Industries <ul style="list-style-type: none"> • PrimeZone • Fact Sheets Digital Farm TV Food A Fact of Life - Interactive games and teaching resources CSIRO - Sustainable Farming Bureau of Meteorology - Climate of Australia KidZone - On the Farm Unit of Work Australian Agriculture - Greatest Story Never Told Agriculture in the Classroom - Fact & activities National Farmers Federation - Farm Facts
Animals	Target 100 - Study Guides and Digital Lessons Australian Pork Industry - Pigs Department of Primary Industries - Fishing and Aquaculture Australian Egg Corporation Australian Chicken Meat Federation Art4Agriculture Dairy Australia - Discover Dairy Kindy House - Farm Animals (songs)
Fruit & Vegetables	Healthy Kids - Crunch & Sip Aussie Apples Sydney Markets - Fresh for Kids
Crops	Grains Research and Development Future Ag - Grains Cotton Australia SunRice
Farm Resources	Ardagh Group - Canned Foods Kids Farm - Farm Equipment Farm Safe - Play Safe on Farms How Stuff Works - Irrigation John Deere - Kids Games, Stories and Resources Sydney Water - Education

www.rasnsw.com.au/education

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FAST FACTS ABOUT AUSTRALIAN AGRICULTURE

Art4Agriculture administer the Annual Archibull Prize Award. The Archibull project is the perfect STEAM project with a unique combination of themes of agriculture, art and science. Participating schools pair school students with Young Farming Champions who assist students in gaining a greater awareness of the vast array of careers and encouraging engagement with the agricultural sector. Each of the following links has a snapshot of current facts, data and overview of the following industries. For more information on the program please visit the website (<http://archibullprize.com.au>).

SUGGESTED RESOURCES:

CATTLE & SHEEP: <http://archibullprize.com.au/industry-snapshots/cattle-and-sheep.html>

COTTON: <http://archibullprize.com.au/industry-snapshots/cotton.html>

DAIRY: <http://archibullprize.com.au/industry-snapshots/dairy.html>

EGG & POULTRY: <http://archibullprize.com.au/industry-snapshots/poultry.html>

GRAINS: <http://archibullprize.com.au/industry-snapshots/grains.html>

PORK: <http://archibullprize.com.au/industry-snapshots/pork.html>

WOOL: <http://archibullprize.com.au/industry-snapshots/wool.html>

THE NSW DEPARTMENT OF PRIMARY INDUSTRIES (DPI) PERFORMANCE, DATA AND INSIGHTS 2018

DPI produces an annual report to provide a snapshot of statistics and value of agriculture in NSW. The use of infographics, tables and charts make this document accessible to students and inspirational for recording and displaying mathematical data in a fun and interesting manner. Use this resource to help incorporate Math's and Visual Literacy into your Agricultural Programs.

SUGGESTED RESOURCE:

<https://www.dpi.nsw.gov.au/about-us/publications/pdi/2018>

NATIONAL FARMERS FEDERATION

Every year, the National Farmers Federation of Australia produce a snap shot of our Agricultural Industry. This is a very useful guide to find up to date data and information. It is designed as a fast reference to national and state-by-state facts about Australia's farm sector, including specific data on Australia's leading agricultural commodities, covering: Beef, Cotton, Dairy, Dried Fruits, Forestry, Grains, Rice, Sheep Meat, Sugar and Wool.

SUGGESTED RESOURCE:

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

PRIMEZONE

This site is hosted by Primary Industries Education Foundation Australia (PIEFA) and provides a credible and authoritative one stop source for primary industries educational information and resources to help build knowledge about this sector.

SUGGESTED RESOURCE:

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

ANIMALS IN SCHOOLS

The purpose of this website is to assist schools to satisfy the requirements of the Animals Research Act 1985 (NSW) and the Australian code for the care and use of animals for scientific purposes. This advice applies to all schools of the NSW Department of Education, NSW Catholic Education Commission and Association of Independent Schools of NSW.

SUGGESTED RESOURCE:

<http://nswschoolanimals.com>

GROUND WORK

**FOCUS ON LANGUAGE
& PRIOR KNOWLEDGE**



Ground Work

FOCUS ON LANGUAGE & PRIOR KNOWLEDGE

The aim of the following ideas are to familiarise students with language used during the program, to see the relevance of agriculture in their daily lives and to recognise and build on prior knowledge and experiences related to food & fibre production.



WHAT DOES A FARM AND A TABLE HAVE IN COMMON?

The Farm to Table & Field to Fibre themes are the basis for a STEM project to encourage students to participate at every stage in the learning cycle. Start with open ended questions when brainstorming what a Farm and a Table could have in common. Go beyond the simple fact that a table is built out of farmed timber and think about what tables are used for such as in, food preparation & eating, education, industry, scientific investigation and a host of other jobs. Explore what goes on a table that came from a farm and consider the alternatives if they did not exist and what it would mean to be without these.

- Students brainstorm as the teacher scribes and assists by grouping information into sub-themes as the class offers what they know about 'Farm to Table' as a concept
- Ask students what they would like to investigate further and record these questions. You can draw a focus to the theme or project being explored if already identified. Revisit this at the end of the unit of work to see how their knowledge and understanding has changed.

Remember to discover student's interests and prior knowledge and ask them to share their stories, such as;

- Have you ever been on a farm? (If yes, ask what country, what was grown/raised)
- Do you know anyone who is a farmer? (ask to elaborate)
- Would you like to be a farmer? (why or why not)
- What jobs are associated with farming?
- Are there any issues or problems with farming?



WHERE'S AGRICULTURE?

Agriculture is a vital ingredient or additive in thousands of products. Familiarisation of what comes from a farm and how students interact with these products in their everyday lives helps broaden student's questions about the importance of this industry in society.

- View 'Where's Agriculture' poster for students to locate and talk about many of the by-products of the Agricultural Industry such as the leather in footballs and suntan lotion made from canola oil.
- Challenge students to create a similar poster for their classroom.

DOWNLOAD WHERE'S AGRICULTURE

<http://www.rasns.w.com.au/education>

CAN YOU FIND THE FOLLOWING ITEMS?

- Construction workers
- Wheat crop
- Tennis players
- Mechanic
- Boy in pyjamas
- Australian flag
- Post box
- Man on the bicycle
- Computer store
- Man working in his flower bed
- Fireworks

CAN YOU ANSWER THE FOLLOWING?

- Where does leather come from? _____
- What goes into a silo? _____
- Where does wheat get used? _____
- Where are tennis racket strings made from? _____
- Where does shaving cream come from? _____
- What is a pillow stuffed with? _____
- What insect goes inside a hive? _____
- Where do these insects get their main source of food from? _____
- What goes in the post box? _____
- What is paper made from? _____
- What do pigs eat? _____
- What is the source of organic fertilisers? _____
- Where does cut timber come from? _____

JUST FOR FUN...

How many cows can you find? _____

How many sheep can you find? _____

Pigs...can you find them all? _____



DO YOU KNOW YOUR SOWS FROM YOUR COWS?

Familiarise students with the different names for types and classes of farm animals. Challenge them to find which breeds of sheep or poultry are bred in NSW. There are many fun ways to facilitate student understanding such as;

- a game of snap with students calling out animals breed name as the cards are played.
- pairs of students sit back-to-back and as one describes a farm animal the other guesses what animal they are describing.
- Research the nouns used to describe male, female and baby animals and collective nouns for groups of animals.

SUGGESTED RESOURCES:

Photographic Dictionary. <https://photographicdictionary.com/farm-animals?page=1>

RASNSW Farmyard Worksheet: http://www.rasnsw.com.au/globalassets/document-library/rasnsw/education/primary-resources/2016-rasedu/unit4_farmyard_nursery.pdf



IS THAT AN ARTICHOKE OR CUSTARD APPLE?

You might be surprised at some of the fruit and vegetables that students are not familiar with.

- Brainstorm and record all the names of fruit and vegetables that students know. Download some images and have students categorise in different ways; colour, shape, size, student's preference (e.g. ones they like or dislike), how they grow (e.g. root vegetables, fruits that grow on trees), starting with the same letter (e.g. carrots and cabbage), how they are eaten (e.g. cooked/uncooked/either cooked or uncooked, whole or cut into pieces).
- Students choose one fruit or vegetable that they are unfamiliar with and search for its botanical name, where and how is it grown and most commonly eaten. Students either share knowledge with a classmate or create a class display.



ARE THEY VEGETABLES OR FRUIT?

The following are 'Fruits' in a botanical sense, though are commonly thought of as vegetables due to their culinary uses: avocado, cucumber, eggplant, green beans, peppers, pumpkin, squash, tomato, zucchini. Corn is a cereal grain and is also a type of fruit. Mushrooms – biologically a mushroom is not a plant; it's a fungus, so technically it isn't a vegetable. However most would consider the mushroom as a vegetable because of its use in cooking.

- Students' research a wide variety of fruit & vegetables and report back explaining the features used to scientifically categorise this produce. Ask students to explain why a tomato, cucumber and chilli are all classified as fruits or why a banana can be classified a herb.

SUGGESTED RESOURCES:

Fresh for Kids: <http://www.freshforkids.com.au/index.html>

Great Grub Club: <http://www.greatgrubclub.com/a-z-fruit-veg#.WdbGj7kUm70>



THE LANGUAGE OF AGRICULTURE

Familiarise students with the terms used in the Farm to Table Incursion and suggested activities. Teachers may choose to do this as a specific focus, or to integrate the words and meanings into their literacy programs or spelling banks that are created progressively as the unit of work or PBL develops.

- As students work through their projects, look for the etymology to help them discover the meaning of many words and also look for words that are common in meaning but different in a variety of countries (synonyms), for example; field v/s paddock or barn v/s shed.

FAMILIARISATION OF TERMS USED IN FARM TO TABLE

WORD	DEFINITION
agriculture	the practice of cultivating the land or raising livestock
aquaculture	the farming of plants and animals in fresh or salt water
by-product	something of value that is produced along with the main product
climate	a pattern of weather over a long period of time
commercial	grown or farmed to be sold for profit
cultivating	to prepare and work on the land in order to raise crops
drought	to have insufficient rainfall or stored water in dams creeks and rivers
economy	the movement of money as goods and services are bought and sold
export	to send goods or animals to other countries for sale
farm	workplace consisting of farm buildings and cultivated land
farming	working the land as an occupation or way of life
fibre	a single piece of a given material, often twisted with other fibres to form thread
free-range	chickens that are allowed to roam outside
horticulture	the growing of plants including fruit, vegetables and flowers
irrigation	supplying water from a body of water such as a river to farmland to grow crops
livestock	farm animals such as cattle and sheep
mixed farming	growing crops and feed and livestock all on the same farm
muster	gather together livestock in one place
paddock	a fenced area used to keep livestock or grow crops used to keep livestock or to grow crops
pesticide	a chemical spray that kills insects
poultry	birds such as chickens, ducks, geese or turkeys raised for meat or eggs
Primary Industries	industries that supply us with food, energy and the raw materials to manufacture other products
process	a series of actions, changes, or functions bringing about a result
regional	'relating to' or 'typical of' a particular area of a country or the world
rural	found in or living in the country
sustainable	able to continue indefinitely
urban	relating to towns and cities



JOBS THAT WOULDN'T EXIST WITHOUT FARMS. WHAT DO FARMERS AND PEOPLE WHO WORK IN AGRICULTURE DO?

Ask students to describe food producers (farmers) and what their daily work routine might look like?

- Brainstorm and discuss other jobs that are associated with food production from the paddock to the plate
- Choose one product and work together to sequence the processes and the jobs in a supply chain between producer and consumer using diagrams and labels (for example harvest potatoes, transport to factory, processed into chips, transport to shops). Students then choose one other food product and and fibre (cotton, wool) to complete their sequence of processes.

SUGGESTED RESOURCES:

RASNSW Paddock to Plate/Field to Fibre Flowchart. http://www.rasnsw.com.au/globalassets/document-library/rasnsw/education/primary-resources/2016-rasedu/unit1_ptop_and_ftof_flowchart.pdf

Paddock to Plate & Field to Fibre Flow Chart

Draw and label pictures to show the Paddock to Plate and Field to Fibre stories of three farm products you use every day.

Paddock					Plate
→	→	→	→	→	
Paddock					Plate
→	→	→	→	→	
Field					Fibre
→	→	→	→	→	

Name _____
Date _____

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Unit One
HSE / S & T



FARMER 'SAY CHEESE'!

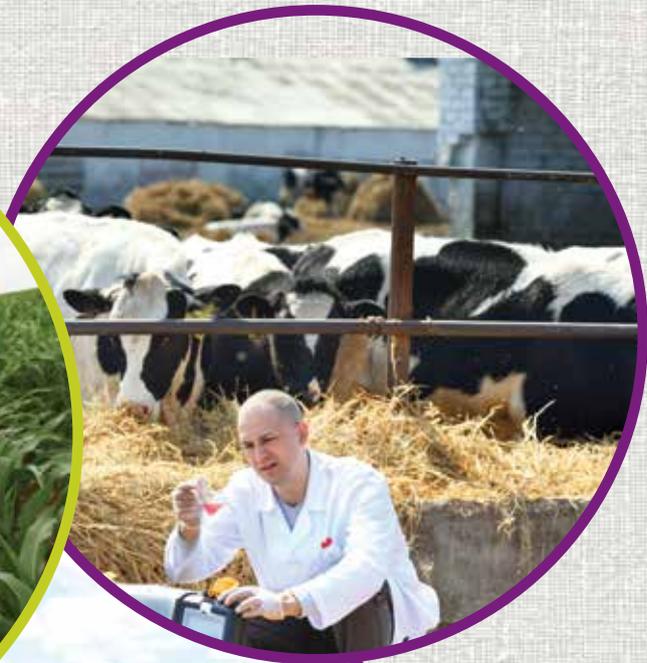
When you do an internet search asking what farmers look like, you tend to get images of older men in a checked flannelette shirt or with bib & brace overalls holding a garden fork.

- Look through newspapers like *The Land* and see if you can find examples of farmers. Students draw a picture and write a statement e.g. "I think that farmers are... hard-working." Ask students to use descriptive language, e.g. farmers are: old-fashioned/technology savvy, clean/dirty, smart, poor/wealthy, hard-working, friendly etc. Conduct a student poll with a yes/no response, and use the data collected to create graphs.

SUGGESTED RESOURCES:

The Land Newspaper: <http://www.theland.com.au/>

Flickr Photo Library: A fantastic collection that covers all aspects of agriculture. It is free to sign up and you can then search for 'Australian agriculture' to instantly find a real variety of appropriate farming images for the classroom: <https://www.flickr.com/search/?text=australian%20agriculture>



THE EVENT

INCURSION/EXCURSION
OR SPECIAL GUEST



The Event

INCURSION/EXCURSION OR SPECIAL GUEST

The aim of the following ideas is to help you facilitate a smooth and valuable experience for the school and students to best gain hands-on experiences and expert knowledge with an aspect of agriculture.

- Be sure to gain permission for photography of students for external providers
- If cooking or sampling food, check for children's allergies
- If an external presenter/guest is coming into your school, check their power needs and if bringing animals, special requirements such as shade, access to water and parking for trailer
- Complete a Risk Assessment
- Organise student volunteers to greet guests, show them where to go and help where possible
- Organise a student to thank the guest/s at the conclusion.

HAND WASH HIGH 5

- Familiarise students with expected hygiene procedures and behaviour when handling animals, soil or food & fibre products to ensure the hands-on activities are as safe and positive as possible during the incursion.

SUGGESTED RESOURCES:

RASNSW Hand Wash High 5.

<http://www.rasnsw.com.au/education>

Hand Wash high five!

5 easy steps to hand washing



CAN I ASK A QUESTION?

Create a list of questions and write on cards to be distributed to students to ask presenters during the incursion.

- Questions about the **presenter's personal history**. For example: When and how did you first become interested in farming? How long have you been on the farm? Does anyone else in your family work in agriculture?
- Questions about the **presenter's farm**. For example: Why did you choose your farm?
- What are the benefits/issues about farming in your area? What technology do you use on your farm? What do you do with the farm when you go on holidays? What is special about your farm?
- Questions about **farming style**. For example: What makes a good farmer? Are there different things you want to do on your farm? Is there something you don't like about the type of farming you do? How does your daily routine change with the seasons?
- Questions about their **farming industry/s**. For example: What is one of the issues in your industry? Are there enough young people in your industry to keep it growing? What needs to improve/change in your industry to help feed and clothe our growing population? Are you worried about Climate Change?

PRESENTATION

- Students listen, watch, record via digital images and interview presenter/s. The presenter/s may have live plants, soil or livestock. Please ensure all presenters instructions for handling these are adhered to.

FARM TO TABLE THEMES



Farm to Table Themes

The aim of the following themes and links to resources is to provide teachers with a tool kit of ideas to guide student exploration in the Farm to Table story.

Every activity could be further developed into a STEM project, a scientific investigation and/or a design and make task depending on student interest and ability. Assist students to identify a need or issue that requires finding a solution to a problem and ensure project plans are created and evaluated. Approve the most relevant themes for your students learning programs and students prior knowledge, or use multiple themes throughout the class to collaborate towards the one goal. The solution to any STEM Project is never a simple, one process answer and should allow students to conduct relevant research to solve the identified problem or issue. All STEM projects should culminate in an end product for the student(s) to present to an audience.

The End Product



WHAT'S ON YOUR TABLE?

In 2012, the Australian Council for Educational Research surveyed almost 1,000 children aged between 10 and 12 years old and found that 75 percent thought cotton socks were an animal product, while 27 percent believed that yogurt came from plants. Ask students to think if everyone knows where their food comes from.

- Students design and conduct a class/school community survey investigating food consumed for breakfast, whether students grow any food at home, what's their favourite food and where did it come from? Other ideas can be generated by the students, but try to keep the survey short and concise by designing multiple choice questions.
- Challenge students to create questionnaire and collect data on a digital device. Surveys can be conducted either individually or as a class. Students analyze and present the results using infographics or graphs.
- Ask students to evaluate the survey and suggest improvements to either the survey design or the surveying process. Students recommend three ways students could be better educated about the origin of their food and fibre and discuss with the class or group.



FIBRES WE LIVE WITH

Fibre is a confusing word. Students often associate it with food as they hear about the need to have fibre in their diets. Start any discussion around fibre with students looking up the meaning of this word to discover it is actually referring to a single strand (thread or filament) that is longer than it is wide.

- Discuss with students that they are looking into the fibres that make our clothes, furnishings, towels etc. These fibres come from plants or animals are called natural fibres. Examples are cotton, jute, wool, and silk. Fibres that are made from chemicals by man are called synthetic fibres. Examples are nylon, rayon, polyester, and acrylic. Explore daily used fibres and bring in as many samples as you can for students to touch and feel and discuss what is different or the same about each sample.
- Have students form pairs and choose one fibre to research to discover where it comes from, how it is commonly used as an everyday product and the end products' features and benefits.
- Create a class display, dividing up the natural and man-made products with labels showing where it comes from (plant, animal, man-made), the variety of products it is commonly used for (eg: wool is used for jumpers, horse rugs, carpet) and some of the features and benefits (can be itchy but keeps you warm).



PACKAGING INFORMATION & COUNTRY OF ORIGIN

- Collect or ask students to bring in some empty food packaging (e.g. cereal boxes, cans, packets). Locate produce information to discuss and explore the language and data on the label. Identify;
 - Date marking (is this a 'use by' or 'best before' date and discuss difference)
 - Product name
 - Ingredient list
 - Nutrition information
 - Usage instructions
 - Manufactures details
- Research labelling rules and logos about country of origin and statements about where the product is made or processed. Look at the Australian Made web site for useful information. Students use their research and information from the packaging to categorise produce;
 - Based on what type of farm did the raw product come from (eg: dairy/orchard)
 - Based on where the product was produced (grown)
 - Based on where they were processed
 - Based on where they were packed

SUGGESTED RESOURCES:

Australian Made: <http://www.australianmade.com.au/why-buy-australian-made/about-the-logo/>

NSW Food Authority: <http://www.foodauthority.nsw.gov.au/foodsafetyandyou/food-labelling/food-production/country-of-origin>



KITCHEN AUDIT

If your school has a canteen, find out if your students can have access to it for 30 minutes.

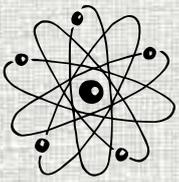
- Students complete a fridge audit and list all the food into categories; dairy, grain, fruit, vegetable, meat, poultry, seafood and miscellaneous items. Check all food is sorted into one of the above groups and discuss those products that have more than one ingredient and determine where they should be listed and why. Guide students to look at labels to find the main ingredient and talk about the language used in information on labels and some of the language used to describe added sugar and fats. To expediate the process have students use visual recording digital devices to prompt further discussion back in the classroom.



THE COST OF FOOD

Source some supermarket catalogues or provide a link to a supermarket online shopping guide.

- Ask students to calculate the cost of food and drinks for a family of four for one day (breakfast, lunch, dinner and snacks). Compare findings and discuss with classmates.
- Students use the data to set some group challenges to discover how many food groups have been eaten and represent their findings in a pie graph. Students then calculate how much each food group costs and determine the cheapest and most expensive food groups used.
- Extend some students to discover the cost per kilogram of a list of products sold in bulk and compare with smaller packaged goods of the same product. Discuss pros and cons of buying in bulk.
- Some students could research how much the farmer receives for the raw product and discuss their findings.



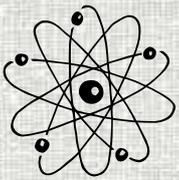
STORING FOOD PRODUCTS

How long will food last and still be healthy for you to eat depends on the food, the manner in which it is stored and where it is stored.

- Students visit the NSW Food Authority's 'Safe Food Tips' and discuss where products are stored in different ways why this is important for the quality and safety of the food.
- To extend investigation, ask students to track how milk is stored safely from being milked at the dairy farm to being in your home fridge.

SUGGESTED RESOURCES:

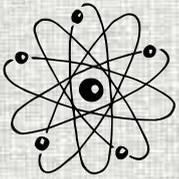
NSW Food Authority: <https://www.foodsafety.com.au/resources/articles/safe-food-storage-tips>



WHOLEFOODS VERSES PROCESSED FOOD. WHICH IS GOOD FUEL FOR YOUR BODY?

As recently as 100 years ago, the average person's diet was determined by the capacity to grow, hunt or gather. Our ancestors only ate 'wholefoods'. They ate mainly fruit, vegetables, grains, unpasteurised butter, milk and cheese, meat, fish and eggs. Since the early 1900s, our food supply has become ever more industrialised. The World Health Organisation believes the amount of processed foods consumed is responsible for increasing levels of obesity, diabetes and coronary disease.

- Discuss how our food is more manufactured than in the past, why this has increased the variety of foods available all year round and explore why processed food is often not as nutritious for our health. Students start by listing the wholefoods and processed foods in their lunchboxes and see if they believe it is the best choices for a healthy lifestyle.



WHAT'S IN YOUR BREAD?

Bread is one of the oldest prepared foods, dating back to over 3500 BCE when lumps of dough, unleavened, were placed on hot stones in the embers of a wood fire. Bread soon became essential to life itself.

- Ask students to bring in different types of bread. You may get plain, wholemeal, mixed grain, oatmeal, rye, soda and flat breads. Set up an observation and taste test (check for allergies first). Ask the children to suggest features for comparison such as what the bread looks like, its texture, the size of its holes / bubbles, its taste and whether they like or dislike it. Have students rank each type of bread and then ask them to create a graph of their choice to show the results.
- Students then research different recipes for each type of bread to look at ingredients and make some conclusions about why the class prefer certain types of bread over others. This could include the amount of salt, whole grains or other additives.
- You often need a full day to make bread to further investigate how yeast and heat are used in make bread rise. If it is possible to conduct this throughout other learning during the day, download the Grain Chain Investigation on the link below.
- Plan to grow rice in an old bathtub.

SUGGESTED RESOURCES:

Grain Chain: Investigate how yeast is used in bread making and explain the optimum conditions required.

<https://www.grainchain.com/sites/default/files/14-16%20Bread%20science%20lesson%20plan.pdf>

How to Grow and Harvest Grains in Your Backyard: is an American site but has good information to help sow, grow and harvest your grain in small spaces. <https://modernfarmer.com/2015/08/how-to-grow-and-harvest-grains-in-your-backyard/>

Home is where the Farm is: <https://www.rasnw.com.au/education/education-resources/primary-schools/>

STEM PROJECT

BUILD A CHOOK HOUSE

- Students identify nutritious wholefoods that could be grown in managed environments at school. This could be as adventurous as creating a Poultry Palace. Students design a chook house that incorporates feed and watering points for hens and incorporates a design that considers the space available and keeps predators out. Eggs are a great food with an extended shelf life. Students design and create a healthy meal using eggs or produce they could grow and harvest at school.

SUGGESTED RESOURCES:

Technology in agriculture: www.youtube.com/watch?v=kIMGdeEhIQ&feature=youtu.be

History of agriculture in Australia: www.australia.gov.au/about-australia/australian-story/austn-farming-and-agriculture

www.landlearn.net.au/print/wheat_farmer.htm

www.sl.nsw.gov.au/discover_collections/history_nation/agriculture/produce/wheat/index.html



What Happens on a Farm?



A DAY IN THE LIFE OF A DAIRY FARMER

What does a farmer's day look like compared to yours? How does this compare with the timing of your daily activities? How does this change during different seasons? The book by Penny Matthews, 'A Year on Our Farm' is a great text to integrate into this theme.

- Research and discuss the two sites below from Australia and New Zealand for an understanding of a Dairy Farmer's Day. The last site is from the United States and uses some American language such as 'Ranch'; however it has some good information about the day in the life of farming outside the Dairy Industry. Students could respond by creating flow charts to sequence activities in a farmer's day and activities in their own day to show visually, where there are similarities and differences. Students could then write some conclusions about their results.

SUGGESTED RESOURCES:

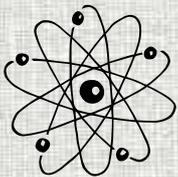
Dairy Australia-Legendary: <http://www.legendairy.com.au/dairy-farming/our-farming/a-day-on-the-farm>

Go Dairy (New Zealand): <http://www.godairy.co.nz/life-on-the-farm/a-day-in-the-life>

Sokanu is a Canadian career matching platform that helps people find their ideal career:

<https://www.sokanu.com/careers/farmer/>

A Year on Our Farm by Penny Matthews (ISBN-13:978 1 86291 492 6)



WHAT KEEPS A FARMER BUSY?

Do farmers just sit around and watch their crops and animals grow most of the year? Discuss how all living things have needs that must be met for them to survive and be healthy. Living things all need water and something to eat, including plants. Plants grow roots to take up nutrients such as minerals and water and they make glucose (sugars) in their leaves using a process called photosynthesis with help from the sun (or light energy) and carbon dioxide found in the air. Plants can be grown for humans to eat, or other varieties are grown as food for the animals living on the farm. Often farmers will grow excess crops and store these in the form of grain or make hay/silage for winter or times when there is low rainfall. Large animals such as sheep and cattle need to be moved around to different paddocks where there is fresh food for them to eat, gain access to water and shelter from the weather. Some smaller animals such as chooks and pigs are kept in sheds where a farmer can provide all their needs and some plants are grown in greenhouses for optimal growth. Both plants and animals also need to be protected from many potential issues such as disease, other animals or plants, insects, birds or fungi.

- Children bring in all kinds of seeds such as: avocado seeds, acorns, apple pips or commercially bought seeds to provide the conditions for germination and observe them over time to see if they begin to grow.
- Scientific Investigation: Students design and develop a scientific investigation on the needs of a specific plant to determine its ideal managed growing conditions. How does light or soil quality affect growing plants? Plan and carry out a fair test looking at the effect of light, different soil types or the amount of water given to the plant and the overall effect on the plant's growth.



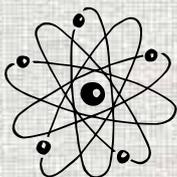
QUIET, THE WEATHER REPORT IS ON TV!

How can two people see the weather in two very different ways?

- Ask students to describe what they think the perfect weather would be for a range of situations. E.g. Going to the beach, playing outdoor sport, reading a book or having a campfire.
- Discuss other situations where different people can have different opinions about the same thing? Think about when it rains when you want to play sport on Saturday but on the same day, a farmer desperately needs the rain to save their crops.
- Ask students how they think we could help people understand other people's points of view? Students could respond by creating a written discussion, an advertisement, role play, rap or poster to present or display their ideas and discoveries.

SUGGESTED RESOURCE:

A blog from the Peterson Bros, siblings who farm together with their parents in Kansas in USA. The farm is a 5th generation family farm that raises cattle, wheat, corn, soybeans and alfalfa. The family started making YouTube videos in 2012, when the oldest brother Greg had an idea to make a parody music video with his brothers to help educate their city friends about farming. <https://petersonfarmblog.com/2015/11/06/the-peterson-farm-bros-change-popular-songs-into-parodies-about-farming/>



IT NEVER RAINS BUT IT POURS

'It never rains but it pours' can be used in both positive and negative situations: From dictionary.com: *When something good or bad occurs, it usually occurs more than once and often within a short period of time: So using this saying in a positive way is fine. Farmers will often talk about the ideal growing conditions for their crops. A farmer's relationship with the weather is often very different than most people who do not rely on the weather for their livelihood. For effective food production, rain needs to fall in the right amount, in the right place, at the right time! In Sydney, the Mediterranean climate has rainfall usually occurring more in winter.*

- Brainstorm some ways that rain can inconvenience farmers and some ways that rain can help them. In groups, students research one grain crop grown on a large scale, such as wheat, rice, corn or soybeans to discover the best growing conditions and weather required for a good crop. Create fact sheets with a timeline linked to the seasons to display.
- View the Climate Dogs clips on the Climate Kelpie website to get a better understanding of Australian weather conditions. Work in groups, each group working on one of the Climate Dogs themes and discuss how each weather theme could affect a staple food crop (wheat, rice, corn, potatoes etc).

SUGGESTED RESOURCES:

SFGate: Growing conditions for some staple food grains. <http://homeguides.sfgate.com/conditions-need-grow-rice-wheat-corn-soybeans-80104.html>

Climate Kelpie is for Australian farmers and their advisors. It connects you to tools and information about climate to help you make decisions about your farm business. <http://www.climatekelpie.com.au/>

Bureau of Meteorology: <http://www.bom.gov.au/watl/about-weather-and-climate/risk/index.shtml>



SEASONS FOR YOUR SALAD IN NSW

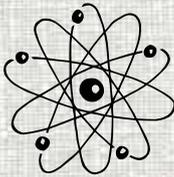
Introduce the idea that different plants that are grown for food have different growing seasons.

- Research one of RASNSW resources; Home is Where the Farm Is. View the Seasonal Planting Guide on page 11 and discuss. Talk about what season the different fruit and vegetables will be harvested and construct a harvesting calendar for the produce. To help guide you, view the link below to Sydney Markets and look at what fruit and vegetables are harvested and available across all four seasons in New South Wales.
- Students can research further to locate growing region/s for each produce and show on a map of NSW. In groups, students produce a seasonal shopping guide for their favourite fruit and vegetables.

SUGGESTED RESOURCES:

RASNSW Home is Where the Farm Is: http://www.rasnsw.com.au/globalassets/document-library/rasnsw/education/junior-farm-hands/ras-home-is-where-the-farm-is_a4-booklet-final.pdf

Sydney Markets – What’s in Season Guide: <http://www.sydneymarkets.com.au/markets/produce-market/whats-in-season/spring.html>



CROP ROTATION

In farming, a crop is the name given for an area of a specific plant grown in a paddock e.g. an oats crop, a lucerne crop etc.

- Students research why farmers rotate crops and give examples to demonstrate their understanding. The same term can apply to kitchen gardens e.g. the tomato crop, lettuce crop. Crop rotation means planting different types of plants in successive seasons and helps deliver important nutrients back to the soil. Talk also about resting paddocks and why this is important for sustainable farming.

STEM PROJECT

BUILD A GARDEN BED

- Help identify community members that could assist with this challenging project of building the garden beds. They may also be able to assist with setting up flow hives producing honey from native bees or composting systems to address sustainable gardening practices.
- Students plan and make a system to sustainably grow some wholefoods for a healthy meal. Students decide how to propagate produce by possibly creating a raised bed with strawberries, salad greens and cherry tomatoes or growing them in pots or a simple hydroponic set up.
- Research the following links before students create a plan and 3 year planting guide for a school garden. Encourage students to use the best practice of crop rotation for the soil, whilst still ensuring there are still crops to harvest. Show best practice of crop rotation for the health of the soil and so there is always something to harvest.

SUGGESTED RESOURCES:

Gardening Australia: www.abc.net.au/gardening/vegieguide/crop_rotation.htm

ABC Splash: www.splash.abc.net.au/en/media/-/m/1264687/contact-us

Australian Organic Schools: www.organicsschools.com.au/

Metro, Rural or Remote?



STORIES FROM MELBOURNE & COUNTRY QUEENSLAND

Have you ever wondered what it would be like to grow up more than 16 hours drive from the nearest capital city? What about going to school in a high-rise building in the centre of one of those big, busy cities?

- View this story to meet Angus from country Queensland and Emilia from Melbourne.
- Discuss some of the ways their lives are different and some of the things they have in common. Students create Venn Diagrams to visually show commonalities.

SUGGESTED RESOURCE:

Behind the News: Two students talk about their respective lives. One who lives in a capital city and the other in a country region. <http://www.abc.net.au/btn/story/s4674371.htm>



COUNTRY VERSES CITY LIFE

It is a fact that over 2/3 of Australia's population now live in cities and this is a growing trend. That means a large proportion of people depend on a very small proportion of people to provide them with food and fibre.

- Ask students to list and compare city to country life in terms of schools, home, and interactions with the surrounding environment. Prompts could include types of plants and animals, types of entertainment, access to services, access to team sport and extracurricular activities, size of school, travelling distances, peacefulness etc.
- For the country life list, conduct a poll to ask students to rate each factor as a good point or a bad point, giving reasons why they gave that rating. In summary ask could students see themselves living in the country? Do the same activity for the city list.
- View the following resources and discuss. Ask students to again rate each of the lists and discuss if and why they changed their answers.

SUGGESTED RESOURCES:

What's it like living on a sheep farm? www.envirostories.com.au/es2012/es2012_CW_SheepFarm/index.html

ABC News – Residents of Australia's tiniest towns share what happiness means for them. <http://www.abc.net.au/news/2015-07-15/residents-australias-tiniest-towns-what-happiness-means-to-them/6621440>

Erin's Farm Life Blog: based around our 4yr old's life on her family's farm which is located in the Central Tablelands of NSW, 34km from the town of Cowra. <http://erinsfarmlife.blogspot.com.au/> . Also read the mothers interview about the blog ABC Central West News Article: Farmer's blog aims to connect city pupils to the paddock <http://www.abc.net.au/local/stories/2012/02/08/3425986.htm>



THE BACK OF BURKE OR THE ROAD TO GUNDAGAI

Rural, Remote and Regional... What's the difference?

- View the Australian Institute of Families site and use the key on the Geographic Remoteness in Australia Map to examine distances from services and major towns. Students identify some small NSW's towns that would be classified as each of these types and plot them on the map.

The exercise could be extended to compare different locations in terms of: area, population, number of schools, hospitals, libraries, average house price/block size and main agricultural industries in the area.

SUGGESTED RESOURCE:

Australian Institute of Families: <https://www.aifs.gov.au/institute/pubs/factsheets/2011/fs201103.html>



SAY G'DAY TO A FARMER

- Set up an information exchange with a teacher from a small rural or remote school.
- Students from both regions ask each other to list the good and bad points about where they live and give reasons. For example, ask about school size, location, distance from home to school, before and after school activities, access to team sports, how far is home from a shop or how far to local swimming pools/beach/river. Students share their experiences about living in the city or large rural town.



FEATURES OF REGIONS IN NSW

- Have students choose a town in a rural area before visiting Local Land Services website to discover what NSW Region it is located in. You task students with gathering a broad range of data. Ensure students have picked towns from a variety of regions, from the Western Region to the Central Tablelands, North Coast to the Riverina. Ask students to research their Region's rainfall, climate, soil types, access to water, elevation, geographic features (mountains, deserts, rivers, rainforests, coastline) and access to sale yards or markets for their produce. Students then present their findings to the class. Presentation can be in digital form, a drama piece, news story or another student choice.
- Extend students to research the District Exhibits on display every year at the Easter Show and discuss that some schools also create a District Exhibit.
- Students create a theme and design a display using locally sourced produce from their chosen district.

SUGGESTED RESOURCES:

Local Land Services: <https://www.lls.nsw.gov.au/our-regions/whats-my-region>

Riverina Agriculture Australia Technical Tours: <https://www.youtube.com/watch?v=WfJY1taM3LE>

District Exhibits at Easter Show, Southern District time lapse video: <https://www.youtube.com/watch?v=XfyqkSnoaG4>

STEM PROJECT

Create a Farm Holiday

Once students have an understanding of the regions in NSW it is a perfect opportunity for them to immerse themselves in one region's culture.

- Students create a fictitious farm with the facilities that will attract a city family to book a Farm Holiday at this farm. Students create the design for a web site, trade display, brochure or advertisement with a blurb, some images, a farm map and suggested activities for their farm to showcase the local features and cultural heritage of the area. Add in a travelling map showing distance and travel time for the tourist, a suggested list of what to pack when visiting and a risk assessment showing how you will keep them safe when visiting your farm. Students present their work to a visiting class who give constructive feedback on why they would or would not want to visit and what they would learn at this farm.

SUGGESTED RESOURCE:

Visit NSW: <https://www.visitnsw.com/accommodation-farm-stays>

Visit NSW: <https://www.visitnsw.com/destinations/outback-nsw/corner-country-area>



Managed Environments - Livestock and Crops in NSW



WHAT IS PRIMARY PRODUCTION IN NSW?

Australia produces a wide range of foods, enough to feed over 60 million people. The food industry can be divided into three groups;

- Primary (agriculture & fishing)
- Secondary (manufacturing and processing)
- Tertiary (retail)

They are defined by the changes food undergoes. For example, growing fruit is part of a primary industry, canning it is a secondary industry and selling canned fruit is a tertiary industry. The food processing industry is the largest manufacturing industry in Australia.

In NSW, primary production is worth around \$9billion annually. The major commodities for NSW include wheat, cattle, wool and horticulture. Our cotton and rice industries are recognised as operating at world best practice and aquaculture is our fastest growing primary industry. ABS data indicate that in 2014-2015 there were 35,453 farms in NSW. Beef cattle farms are the most common (13,059 farms), followed by grain farming (4,454 farms).

- Students use the resource Mindmap Agriculture images and sort them into three categories above - Primary, Secondary and Tertiary Industries.
- Students research different farm animals e.g. numbers and distribution in Australia to discover and interpret a variety of ways data is recorded on digital platforms In pairs or groups, they discuss and choose which recording method they find easiest to interpret and why.

SUGGESTED RESOURCES:

NSW Dept. Agriculture and Water Resources: www.agriculture.gov.au/abares/nsw

www.apps.daff.gov.au/agsurf/regions



WHAT IS A MANAGED ENVIRONMENT?

Many people grow some vegetables or fruit in their backyards, balconies or in their school grounds. These are all managed environments. We add nutrients to the soil with potting mix and compost, choose the best place to plant seeds and in what month, manage weeds and pests and water when necessary. This is unlike a self-seeding plant that grow where the seed lands and relying only on nature for all its needs to survive.

- Students choose one of our main agricultural livestock systems, such as beef farming, dairy farming or sheep farming to discover how and why the food or fibre is produced in sustainable managed environments. They are to explore on farm practices of animal management such as stock rotation in paddocks, health care, tools and machines used to care for animals and how farmers manage their diet and nutrition.
- As a whole class or in small groups, discuss and record what are some of the sustainable practices used to help both the livestock and the environment?

SUGGESTED RESOURCE:

Australian Good Meat: www.goodmeat.com.au



HOW DOES SOIL AND CLIMATE AFFECT FOOD GROWTH?

Not everything we eat is grown in NSW and even when we do, it is not always available for us to purchase year round.

- Whilst students study the main agricultural products from each region in NSW, have groups of students create maps showing just the food they like to eat and where it comes from in NSW. They could focus on one processed product such as a cake and locate the origin of the wheat to make the flour, the eggs to bind the cake, fruit to make the jam, cow's milk to make the cream and then track the ingredients from their journey from farm to table.
- Students identify where some products that are not commercially grown in NSW and why, such as macadamia nuts or pineapples. Discuss the reasons why these products are not grown in NSW and identify the ideal conditions required for these products to be grown.
- Students look for the relationship between our climate and soil types that affect the growth of living things.

SUGGESTED RESOURCES:

RASNSW Junior Farm Hands Activity Book. Go to page 8 to locate the NSW Product Map using icons to show where our food & fibre is produced. http://www.rasnsw.com.au/globalassets/document-library/rasnsw/education/junior-farm-hands/2013-jfh-activitybook_a4_web.pdf

Dept. of Agriculture – Broad acre regions: <http://apps.daff.gov.au/agsurf/regions.html>



DID YOU KNOW?

- ~ Australian farmers are environmental stewards; owning, managing and caring for 61% of Australia's land mass. (Source: NFF)
- ~ Around one-third of NSW land is dedicated to farming.
- ~ Hydroponics is a method of farming where plants grow in a nutrient rich solution without soil.
- ~ Horticulture is the name given to the growing of plants, fruit and vegetables.

PRIMARY INDUSTRIES ARE EVERYWHERE! ...GROWING OUR FOOD, FIBRE & SHELTER

Food

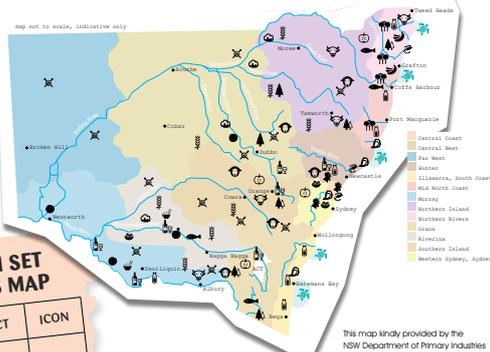
- apples
- bananas
- beef cattle
- dairy cattle
- fish hatcheries
- grains, wheat
- lettuce
- pineapples
- piglets
- poultry
- grain farming
- sheep
- wine

Fibre

- sheep
- cotton

Shelter

- pine plantations
- eucalypt forests
- hardwood plantations
- marine parks



Map set to state, indicative only

This map kindly provided by the NSW Department of Primary Industries

DESIGN YOUR OWN SET OF ICONS FOR THIS MAP

PRODUCT	ICON	PRODUCT	ICON



Why do you think that some products are grown in selected areas but not in others?

Wool is the only product from the Far West region of NSW, can you suggest a reason for this?

Bananas are grown only in the Northern Rivers area, what does this tell you about banana plants?

Research where the mountain ranges are in NSW. Add them to the map above, using an icon you have designed.

2013 JUNIOR FARM HANDS ACTIVITY BOOK 7



THE GRAIN HARVEST

Humans have been eating edible grain, today known as wheat, since about 9000 BCE and it was a key factor in the evolution of settlement based societies. Today wheat is grown on more land (about 240 million hectares) than any other commercial food and supplies about 20% of humanity's caloric intake. In NSW, wheat is the second highest gross value of production earning \$1964m in 2016.

- Students research to discover how adaptations to the environment, increased technology and with the help of scientists, wheat plants survive in their agricultural environments.
- Students could also research how adaptations can affect survival and growth of rice grown in Australian conditions.

SUGGESTED RESOURCE:

ABC Education – Growing Rice: <http://education.abc.net.au/home#!/media/30285/growing-rice>



SPECIALISED FARMS: FISH FARMING/ AQUACULTURE & GREENHOUSES

Aquaculture or fish farming is the raising of fish and shellfish on special farms. Aquaculture can take place in the open ocean, in bays, in ponds, in greenhouses, and even in buildings. Aquaculture can be in either saltwater or freshwater under controlled conditions which is in contrast with commercial fishing, which is the harvesting of wild fish.

Greenhouses are purpose build spaces with glass walls and a glass roof. They are used to grow plants, such as tomatoes and tropical flowers. A greenhouse will stay warm inside, even during the winter. In the daytime, sunlight shines into the greenhouse and warms the plants and air inside.

- Have students look up images of both greenhouses and aquaculture and discuss some of the differences and similarities. Challenge students to look into one vegetable and one fish or shellfish produced on specialised farms and report the benefits back to the class.
- Students can make their own mini greenhouse in the classroom using the link to Make your own Greenhouse below or, once you have checked regulations at Animals in Schools website (link below), the class could care for some fish in the classroom.

SUGGESTED RESOURCES:

Museum Victoria – Make your own greenhouse: https://museumsvictoria.com.au/media/1856/olc_activity3_make_your_own_greenhouse.pdf

Department of Primary Industries NSW: For teacher research and background <https://www.dpi.nsw.gov.au/agriculture/horticulture/greenhouse>

<https://www.dpi.nsw.gov.au/fishing/aquaculture/starting-up/innovation>

Animals in Schools – Aquariums: <http://nswschoolanimals.com/fish-aquariums/>



LIFE CYCLES: ALL LIVING THINGS HAVE A LIFE CYCLE

All living things have a life cycle, some fast and some very slow. The common house fly lives for only four weeks and the shortest lifespan among reptiles is the chameleon with a lifespan of one year. The domestic rabbit lives for 8-12 years and a guinea pig only four years. Compare that with a Bowhead Whale or Red Sea Urchin both believed to live for over 200 years!

In the plant world life cycles are often categorised into Annuals, Perennial, and Biennials. Annuals living for one year or less, Biennials require a minimum of two growing seasons and the Perennials are any plant that lives for more than two years.

- Suggest to students that most lifecycles follow a similar pattern. Challenge them to find what that pattern might be and look for any variables in their research.
- Students work in pairs/groups to compare their data in Venn Diagrams. Look for plants or animals that fall out of the norm and discuss why.

SUGGESTED RESOURCE:

www.kidskonnnect/lifecycles



WAS IT ALWAYS GROWN IN NSW?

Aboriginal peoples have cared for Australia's delicate ecosystem, practiced sustainable farming techniques and lived off the land for over 40,000 years. When the first fleet arrived in 1788, Aboriginal people provided food, such as game and kangaroo to the first colonists, which kept them from starving.

The Eora fisherwoman fished in Sydney Harbour until around 1828 teaching the new settlers how to fish, and passing on traditional knowledge.

- Research Aboriginal traditional food sources in NSW before British settlement. In 1789 James Ruse, a former convict produced the first successful wheat crop in NSW, but only enough to harvest the seed to plant the following year. This led to the first agricultural land grants to free settlers along with some livestock, seeds, tools and assigned convict workers to the settlers willing to farm.
- Research what livestock, plants and seeds were introduced with the arrival of the First Fleet. Choose one farm animal, one plant and one seed to create a time line showing how these have changed over the decades. Look at the increase in herd numbers or crop sizes in the early 1900's and currently in NSW.

SUGGESTED RESOURCES:

Fleet: <https://firstfleetfellowship.org.au/library/first-fleetlist-livestock-provisions-plants-seeds/>

NSW State Library – researching wheat: <https://www.sl.nsw.gov.au/stories/australian-agricultural-and-rural-life/australian-wheat>

STEM PROJECT

Design a Green House

- Research truss tomatoes grown in greenhouses and the Greenhouses of the Netherlands.
- Students identify what space they have to construct a green house. The space might limit their greenhouse to a bench-top or a walk in greenhouse with raised grow beds. Challenge them to use recycled materials where possible in the design.

There is a fantastic nine week unit of work created by NSW Education Standards at the link below to help program and guide students to undertake this STEM project

<http://educationstandards.nsw.edu.au/wps/wcm/connect/be00415a-1e13-4264-9a4b-70a97d90c710/Sample+unit+STEM+Stage+3+-+integrated+Greenhouse.DOCX?MOD=AJPERES&CACHEID=ROOTWORKSPACE-be00415a-1e13-4264-9a4b-70a97d90c710-mnWuA8I>



Processing - Transforming and value adding



WHAT IS FOOD PROCESSING?

Food processing is a human activity. Simply cooking a food or harvesting and cleaning it can be considered processing. People have always been working out and practising ways to help raw food provided by nature to be more edible, longer-lasting, safer, more nutritious, more tasty and lately more attractive as a product. In today's world, unless you are eating a raw fruit or vegetable with its skin on, you are eating a processed food. Initially food processing took place in the family homes and small local communities and included;

- Preserving meat and fish with salt
- Grinding and milling grains for porridges and baked foods
- Cooking by boiling, baking, roasting, grilling, frying, smoking and steaming
- Drying by sun-drying meat, fish, fruit and vegetables
- Fermenting fruit, vegetables and grains

Food processing is increasingly taking place in factories as our human societies become more technologically advanced and new ways of food processing have become established to include;

- Pasteurising milk
- Bottling fruit and vegetables in the form of jams, preserves, pickles, condiments and sauces
- Canning fish, meat, fruit and vegetables
- Freezing raw and cooked meat, fish, fruit, vegetables and baked foods
- Smoking fish
- Cryovac meat products

Now with many more food science and technological advances there are new ways to process food and include;

- Juice concentrating
- Spray or freeze drying foods such as milk powder, instant coffee, tea, eggs, cereals, instant baby foods, fruit, vegetables, spices, herbs, instant soups and sauces
- Using food additives such as artificial sweeteners, colorants, flavourings, preservatives, emulsifiers, anti-foaming and anti-caking agents
- Ask students to think about food processing in their homes. Individuals list what food processing is done in their homes before combining their information with the class. Come up with categories to group the processes, such as; cooking, freezing/cooling, juicing, chopping/dicing, whipping/mixing, cleaning/washing & other.
- Discuss which category has the most and think about why. Ask if any student's families grind anything in their homes, such as coffee.
- Discuss why we no longer tend to grind our own grains or bottle our fruit and vegetables in spring.
- Discover if any families grow or produce any products for sale at markets – discuss if any extra measures for hygiene and safety are required for this product to be sold.



WHY DO WE PROCESS FOOD?

Food has always been processed. At first, food was processed just for safe storage. Later it was discovered that some processes changed the way food tasted, felt and looked. Today food undergoes processing to extend shelf life, improve flavour, extend seasonal availability or make them easier to store and transport.

- **Scientific Investigation:** Apples, and many other fresh fruits, contain an enzyme that reacts with oxygen in the air. When we cut the apple, we damage the cells in the fruit and allow this enzyme to come into contact with oxygen. There is an oxidation reaction that forms a sort of rust on the cut surface of the fruit. Have students design a scientific investigation to see if there is anything they can do to slow down the process of oxidation. You could suggest and supply the apples, water, lemon juice, cling wrap, salt and refrigeration for them to work with. Students further research how manufacturers produce dried apple slices and what processes are used and if any chemicals are used in the process, what is the purpose for this. How does this process affect the shelf life of the apples? Are there any special qualities to the packaging to assist shelf life?



PROCESSING NUTRIENTS

Processing can change the nutrients in food. For example, heating food can destroy some nutrients, whereas freezing can help retain some nutrients. Fortified food contains added nutrients such as calcium in soy milks. Have students find out why bread-making flour is fortified by law and discuss if this practice addresses a public health issue.

To address important public health concerns, in Australia, by law, bread-making flour must be fortified with folic acid and thiamine, and salt used in bread must be iodised. Sometimes, manufacturers fortify foods voluntarily, for example, breakfast cereals are often fortified with vitamins and minerals.

- Can students find other examples?



PROCESSING THE BASIC INGREDIENT

When assembling ingredients for a recipe, such as flour, butter or cocoa, they are unrecognisable from when they were harvested. Most of the foods available to consumers undergo primary processing, commencing at the point of origin and includes the transporting, cleaning and sorting of the raw food. Primary processing includes;

- Prepare raw food so that it is ready for human consumption in an appealing and useable form, such as removing insects, soil and stones from the edible parts of the food
- Make raw food ready for transport to supply to the consumer regardless of their location
- Extend shelf life by managing storage conditions such as temperature and cross contamination
- Prepare raw food for delivery to food manufactures for conversion into other food products such as wheat being milled and converted into flour to make pasta

Some foods undergo **secondary processing** when primary products are changed into other types of products. Secondary processing is a series of actions that change primary products into other food products. This can happen by changing the chemical and physical properties, such as producing skim milk from full-cream milk or combining one or more different ingredients to create a very diverse range of products such as muffins or strawberry milk. Some of the reasons for secondary processing includes;

- Foods are processed soon after they are harvested while at their peak and where possible, happens close to where the food is grown to prevent too much food being spoiled through transporting
- The amount of food we require increases as the population increases. By processing food we can store it for use when required
- Much of our perishable food, such as fruit and vegetables, is seasonal so by processing an annual harvest the food can be made available throughout the year and give us more dietary choices
- Processing food destroys many micro-organisms which can cause disease, making them safer for consumers
- Processing can add value to an existing food
- Students choose a recipe for one of their favourite fast foods and think about how many different processes each ingredient has undergone before being ready to consume. Students research to discover how all the ingredients for the chosen fast food has to be harvested, stored and transported from the farm gate to the food manufacturing factories. Often each raw product has more than one step of processing to be changed or transformed into a new ingredient. Later the processed or manufactured food has to be stored again and transported to supermarkets, restaurants and corner shops. Students create a flow chart or model to show the processes and manufacturing each ingredient for a chosen fast food has undergone before being consumed. Students should label and describe each process and if any variables such as heat, cold or additives were required at each step and the benefit of each step to the consumer.



FOOD PROCESSING IN AUSTRALIA

Food processing is any method used to turn fresh foods into food products. The fresh and processed food, beverage and grocery industry represents approximately 28 per cent of total manufacturing in Australia. The food processing industry in Australia includes the following sectors;

- Baked products
- Beverage and malt manufacturing
- Dairy products
- Flour mill and cereal food manufacturing
- Fruit and vegetable processing
- Meats and meat products
- Oil and fat manufacturing seafood processing
- Sugar and confectionery manufacturing

ACTIVITY:

- Students choose one of the sectors above and research to discover some of the products produced by this sector and list the methods used to preserve, package or cook the fresh produce, such as canning, freezing, pasteurising, drying or grinding. Compare their findings with other classmates to discover which processes are most common in the foods they researched.

Food processing is any method used to turn fresh foods into food products.

SUGGESTED RESOURCES:

Manildra Group: <https://www.manildra.com.au/products/>

Bilpin Apple Juice: <https://www.bilpinapplejuice.com.au/>

Country Valley Dairy: <http://www.countryvalley.com.au/>

Logan Farm: <http://www.loganfarm.com.au/>

Edgells: <http://edgell.com.au/>

Steggles: <https://www.steggles.com.au/>

Bundaberg Sugar: <https://www.bundysugar.com.au/>



NOTHING IS LEFT TO WASTE

Non-edible parts of plants and animals are used to make additional products we use every day. In addition to food, agriculture provides fibre, housing and biofuels. In fact, agriculture connects to your life every single day and in every single way. When you wake up in the morning, you're lying on cotton sheets. You swing your feet onto a wood floor, a rug made from the wool of a sheep, or flooring made from linseed or soybean oil. The soap you use in the shower contains tallow (a by-product of the beef industry), or cottonseed oil or lanolin (a kind of oil from the wool of sheep). The towel you dry off with and the jeans and T-shirt you put on are made from cotton. You get on your bike and ride on tires reinforced with cotton fibres. When you get to the classroom, you open a book held together with glue made from the hide and hair of a cow or a pig and printed with printer's ink made from soybeans. At recess you go outside and play with a wooden bat and ball made from the hide of a cow.

In short, agriculture feeds us, clothes us, shelters us, helps us get around, helps us play and keeps us clean and well-groomed. It cares for us when we are sick or injured, too. Insulin for diabetics is made from a chemical produced by the pancreas in pigs and beef animals, and pig skin is used in skin grafts for burn victims. Milk proteins help make bandaids stick.

ACTIVITY:

- Students create an infographic, either hand drawn or digitally, showing the by-products of a major primary product, such as wheat, oats, cotton or sheep. Students can use the two links below as guides.

SUGGESTED RESOURCES:

18 Surprising, Everyday Items Made with Corn: <https://www.cheatsheet.com/life/18-surprising-everyday-items-made-with-corn.html?a=viewall>

Beef Cattle By-Products: <http://www.rasnw.com.au/globalassets/document-library/rasnw/education/primary-resources/printable-resources/beef-cattle-by-products.pdf>

BEEF CATTLE BY-PRODUCTS

We use everything but the 'moooo'!

- Bones and Horns**
 - ☆ Bone China
 - ☆ Ice Cream
 - ☆ Piano keys
 - ☆ Candles
 - ☆ Knife handles
 - ☆ Vitamin Capsules
 - ☆ Chewing gum
 - ☆ Lipstick
 - ☆ Wallpaper paste
 - ☆ Comb
 - ☆ Photo Film
 - ☆ Plastic
 - ☆ Emery boards
 - ☆ Glass
 - ☆ Shampoo
- Glands and Organs**
 - ☆ Asphalt
 - ☆ Cosmetics
 - ☆ Fertiliser
 - ☆ LCD Screens
 - ☆ Medicines
 - ☆ Paint
 - ☆ Plastic
 - ☆ Soap
 - ☆ Tires
- Internal Organs**
 - ☆ Instrument strings
 - ☆ Tennis racquet strings
- Skin**
 - ☆ Adhesives
 - ☆ Flavours
 - ☆ Gelatin
 - ☆ Marshmallows
 - ☆ M&M's
 - ☆ Jelly
- Hide and Hair**
 - ☆ Footballs
 - ☆ Car Upholstery
 - ☆ Drum Heads
 - ☆ Leather Coats
 - ☆ Violin Strings
 - ☆ Shoes
 - ☆ Felt Hats
 - ☆ Luggage
 - ☆ Wallets
 - ☆ Leather Watch-bands
 - ☆ Cricket balls
- Fat**
 - ☆ Candles
 - ☆ Chalk
 - ☆ Deodorant
 - ☆ Fireworks
 - ☆ Detergents
 - ☆ Matches
 - ☆ Perfume
 - ☆ Antifreeze
 - ☆ Pet food
 - ☆ Insulation
 - ☆ Lubricants
 - ☆ Cosmetics
 - ☆ Explosives
 - ☆ Linoleum
 - ☆ Crayons
 - ☆ Rubber
 - ☆ Paint
 - ☆ Medicines
 - ☆ Biodiesel
 - ☆ Toothpaste
 - ☆ Shaving Cream

Royal Agricultural Society of NSW **ras edu**



WE'RE GETTING FATTER

Data shows that when you look at the proportion of total household weekly food expenditure, by selected food items, meals out and fast food are the highest spend at over 25% of our weekly spend on food. The number of people who are overweight or obese is continuing to rise. Australia has one of the highest rates of obesity in the world.

Some food products are processed more than others. Fruit and vegetables, for example, are only minimally processed, while chips, crisps and other packaged snack foods are very highly processed food and should be eaten only in moderation because they don't provide any vitamins or nutrients for our body's growth and development. Processed food like frozen vegetables, canned tuna and dried fruit can still provide important nutrients and vitamins.

- Students process some rice in the classroom. Bring in some brown rice and some 70-100 grit sandpaper. Ask students to place one piece of sandpaper flat on the desk. Place several kernels of brown rice on the sandpaper and lay a second piece of sandpaper on top. Rub the two sheets of sandpaper together for 3-5 minutes. When finished, the student's will be able to observe two distinct rice products – milled white rice and rice bran. Rice bran, the by-product, is used as an additive in several different food products. White rice is packaged and sold. Discuss the nutritional differences between white rice and brown rice.

STEM PROJECT

CREATE A BALANCED MEAL

In supermarkets, it is pretty clear that cooking is an activity slowly decreasing in Australian homes. More and more people are using oven ready meals and reheating 'ready to eat' dishes.

- Create a balanced meal using **NSW Dietary Guidelines** as a reference.
- Once students have created their healthy meal, they must calculate how many calories are contained in the meal and then research to discover how much exercise is needed to burn off these calories. As an end product, students design and make a recipe card to contribute to a class set that classmates can then access to create a variety of healthy meals in the future.

SUGGESTED RESOURCES:

Healthy Kids: <https://www.healthykids.nsw.gov.au/kids-teens.aspx>

CSIRO blog: <https://blog.csiro.au/back-school-lunch-tips-make-healthy-eating-easy/>

Choose My Plate: <https://www.choosemyplate.gov/physical-activity-calories-burn>

Nutrition Australia: <http://www.nutritionaustralia.org/national/resource/balancing-energy-and-out>

Agriculture: The Job Description - From Tractors to Test Tubes



WORKING IN AGRICULTURE

Farms are made up of interacting elements like plants, animals, soil, the environment and cutting edge technology. These are all managed by people. 'All things being equal a farm is often as productive as the skilled people who manage and work on the farm'.

- Discuss this statement with students.
- Ask the class to make a list of occupations that are connected to the agricultural industries along all parts of the supply chain. Select a job and find out what the main duties are. What types of qualifications and personal qualities are needed?
- Create a job advertisement based on your findings.

SUGGESTED RESOURCES:

Leconfield is a working property in Northern NSW where you can learn the skills and techniques of being a Jillaroo or Jackaroo. <http://leconfieldjackaroo.com/index.html>

<https://www.rasnw.com.au/globalassets/document-library/rasnw/education/dairy-teacher-workbook.pdf>



THERE'S NO PIZZA DELIVERY OUT HERE!

On small hobby farms, some people still hand milk a cow. On a commercial scale, milking of cows is done by machines, or the use of robots - an emerging technology. Robotic milking, known as automatic milking systems, help address one of the biggest problems for dairy farms - finding labour to complete the work. Why do you think it would be hard to find people to be dairy hands? Help with prompts such as it is dirty work, repetitive, you have to be physically fit, cows are generally milked twice a day so that means early starts and a late finish.

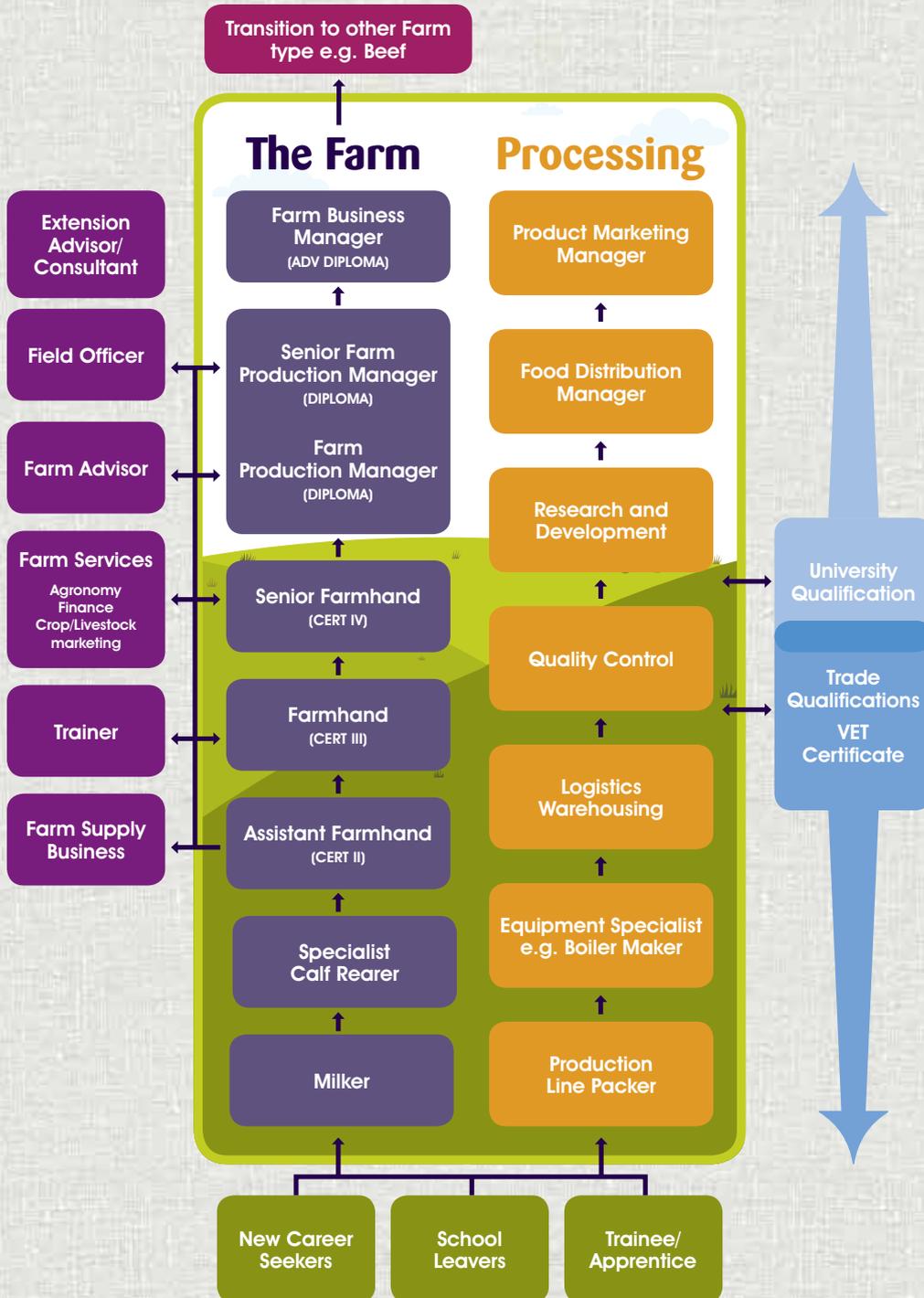
- Design a survey that could be used to find out if a person is suited to an agricultural career. What types of questions would you ask? Match students up with potential jobs that would suit their projected skill sets and qualities.

SUGGESTED RESOURCE:

Career Harvest: This is a food and fibre industry career pathway program and online portal. Scroll through the Career pathways tab to find the skills & qualification required for a host of jobs in agriculture.

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

STEPPING STONES INTO AND OUT OF DAIRY



Royal Agricultural Society of NSW





DO YOU KNOW A JILLAROO FROM A JACKAROO?

Growing up in a city, large rural town or outer suburbs can often mean you have no access to experience what life on a rural or remote property would be like. Yet, the idea of working with animals and mainly outdoors really appeals to you.

- Brainstorm ideas of how a city kid could end up on the land. Think about the subjects to focus on during school years and the sort of experiences or courses available to get a degree to help the transition.
- Create a study plan for your career of choice.

SUGGESTED RESOURCES:

Outback Careers: Rachel Brindley, originally from Melbourne made an adventurous decision to work as a Jillaroo on a cattle station in the Northern Territory that led her to a very different life to the one she had envisaged in the city. <http://outbackcareers.com.au/about/>

RASNSW Career Stepping Stones banners: This series of eight banners is designed for Stage 4, however, they are a useful teacher resource or student extension task to understand the jobs required for the agricultural industries: <http://www.rasnsw.com.au/education/secondary-schools/secondary-school-resources/career-stepping-stones/>



CLOSE YOUR EYES AND PICTURE A FARMER

Stereotypes are generalisations about certain groups of people. We often make judgements about people based on what they wear and how they act.

- Search the internet for images of farmers. What are they wearing? how does it suit their environment and the job they have to do? After researching the variety of jobs in the agricultural sector.
- Have students identify what these people would look like and discuss why these images are not readily available. It would be helpful for the teacher to provide a variety of stereotypical images of farmers for students to view.
- Discuss with students some of the features some agricultural jobs would require in their clothing, such as waterproof, protection from the sun, safe footwear, clothing that won't get caught while working around machinery, eye protection or clothing that can allow workers to keep warm or cool while they work.
- Take note of the title and any pictures. Do they reinforce a particular stereotype? Compare the types of clothes worn by people working in agriculture. Look at tractor drivers, bee keepers, grain research scientist, reporter for country newspaper or chief. Why would these people need to wear certain clothes in their different jobs?
- After this activity, have a discussion about stereotypes and how perceptions can change when we have new information or consider other viewpoints.
- Students could create a new fashion line of clothing for a variety of agricultural careers.

Students as young as 3 are often asked what they want to be when they grow up and this question then follows them around in ever more regularity as they progress through school. As students come to the end of Primary School that question can often start to become more real as the child and their parents look at what school they should attend for secondary schooling. There is current research around saying that career education is best placed to start in the Primary School years so students can look for their strengths and dreams to match them with a goal to work towards. Teachers can start their own research on this from the link below.

One of the options available to students once they are 16 years or older is to choose to go on a Gap Year. This used to be known as a Sabbatical is now a Gap Year or Year 13. A Gap Year can be a fantastic opportunity for students wanting to go into agriculture but want to get some experience to see if this is the right fit for them. There are lots of Australian Gap Year experiences in agriculture available to them.

SUGGESTED RESOURCE:

The Land Newspaper: <https://www.theland.com.au/>

RASNSW Career Stepping Stones: <https://www.rasnsw.com.au/globalassets/document-library/rasnsw/education/career-stepping-stones-posters.pdf>

RIASEC in Primary Schools (for teachers): <https://hollandcodes.wordpress.com/2010/07/16/elementary-school-teachers-counselors-career-education-tools/>

Australia – Jackaroo Jillaroo Course: <https://year13.com.au/gap-years/jackaroo-jillaroo-course>

Cotton Australia Cotton Gap Year: <https://cottonaustralia.com.au/work-in-cotton/cotton-gap>



200 YEARS OF FARMING IN AUSTRALIA

- How does it look now and what will it be like in the future? What would an Australian Farm look like in 50 years from now? How has the Australian farming landscape changed over the last 200 years?
- Investigate the past, present and future of farming. Find pictures to represent each period of time. Make a table showing: Two examples of Australian made “smart farming” technologies, who they were invented or modified by and how they make tasks easier or better.

SUGGESTED RESOURCES:

First Fleet Supply List: <https://firstfleetfellowship.org.au/library/first-fleetlist-livestock-provisions-plants-seeds/>

Agricultural Timeline Belgenny Farm: <https://www.belgennyfarm.com.au/history/site-history/agricultural-timeline>

National Farmers Federation Farm Facts: <https://www.nff.org.au/farm-facts.html>



INNOVATION & KEEPING EVERYTHING GREASED, OILED AND OPERATING ON A FARM

The way farmers work is different today from the way they worked a long time ago. There are more machines to do the work, so things get done faster and more efficiently with increased productivity. A tractor is the most common machine on all farms designed for towing, pushing or pulling. They deliver high tractive effort (or torque) at slow speeds and can often power the other equipment they are pulling. Also common is a sprayer, combine harvester, cotton harvester, field cultivator, cutters and shredders, planters and seeders. Farm vehicles include trucks, tippers, ATVs (All Terrain Vehicles) and motorbikes, water tankers, trailers, 4 wheel drives and even aeroplanes or helicopters. There are all the roads on a farm to maintain, fences to mend, sheds and silos to look after, dams and tanks to check, and tools of all shapes and sizes to keep track of and maintain in the best working order.

- Students work in groups to agree on a list of skills a farmer might need to keep their farm operating efficiently. Think about what services a farmer might need to access to maintain their machinery and the technology that they use. What difficulties might they have sourcing the goods and getting it to their farm in a timely way.



HOW DOES THE USE OF TECHNOLOGY HELP FARMERS?

It takes more than good soil, a little rain and sun for farmers to produce our food and fibre. Farmers have been using digital technology like iPhones to market (or sell) their produce on-line, to give greater control on when and how much they sell it for – enabling them to budget more effectively. Eartags are used by farmers to identify sheep, goat, pig, beef and dairy cattle. Electronic eartags are now mandatory for ALL cattle and are a more efficient way of identifying animals with tag readers so more comprehensive production data can be stored more efficiently and quickly. Increasingly farmers use a GPS in their vehicles and with other systems to accurately plant, fertilise, spray and harvest crops. The benefit of using technologies such as these is that it maximises efficiency, for example, focusing production on more fertile land and reducing chemical use improves environmental outcomes, by using more targeted application of the chemical.

Modern farmers are using more technology to help them every year. New technologies such as high-flex tyres, soil & crop sensors, electric drive systems & autonomous vehicles, mobile computing, radio frequency identification technologies and drought-resistance traits in plants are changing the future of farming.

There is also specialised equipment used on many farms that can milk cows and pump milk into tanks, shear sheep and press wool into bales, pick and sort fruit and vegetables, grade eggs and irrigation systems that have soil moisture sensors, thereby minimising water use. Technology is increasingly being used on farms to monitor weather and water supplies, guide machinery with GPS, survey livestock with drones and check animal water troughs, incorporate solar solar systems to produce electricity and applications on mobile devices that alert farmers in real time and update files on computers.

- Students research the changing face of agricultural technology.
- Students work in groups to investigate one type of farm (orchard, cotton farm, poultry) and create a report on how technology helps farmers.

SUGGESTED RESOURCES:

SMART Farms from University of New England: <https://www.unen.edu.au/research/research-centres-institutes/smart-farm>

STEM PROJECT

Designing a Farm Tech

- Students choose one piece of machinery, one piece of specialist equipment and one piece of technology to explore how they could all work together on a modern farm (e.g. tractor, irrigation system & drone). How could they make working on a farm easier?



Managing the Risk of Farming



CAUSE & EFFECT OF FARMING RISKS

There are many things that can go wrong in farming. In fact, it is probably one of the riskiest businesses to be involved in as it is so dependent on the weather which we have no control over.

- Brainstorm a list of some of the things that could go wrong on a farm such as fire, flood, pests and disease, mechanical breakdown, livestock sickness and poor crops. Try to link each risk with a cause and an effect. Think about how the problems may have a social impact as well as a financial impact (e.g. how would farmers and their families feel)?
- Have students choose one issue and record the possible cause and effects. Discuss if anything could prevent the issue from happening again.



HOW ARE SMALL TOWNS AFFECTED IN A BAD SEASON?

- Choose one of the scenarios from the Cause & Effect of Farming Risks activity above and think about what would happen on a farm due to the problem.
- View the below video of one family on a farm in Central Western NSW and the issues they had. You will see they have used themes from television advertising to put humour into their video.
- Have students create their own videos to demonstrate some of the problems on farm after something has gone wrong.

SUGGESTED RESOURCE:

The Daily Liberal Newspaper. After five months of being flooded in, the Broughton family in Dandaloo have decided enough is enough and documented their daily frustrations. <http://www.dailyliberal.com.au/story/4182598/flooded-farming-family-uses-humour-for-serious-message-video/?cs=112>



FARM SAFETY FOR KIDS

Sadly, around 20 children under 15 years are fatally injured on an Australian farm every year and many more are hospitalised or treated by doctors across rural Australia. The major causes of child injuries on farms are dams, farm vehicles, machinery, motorcycles and horses.

- First identify some of the accidents that can happen on farms and then have students think about how far some of the rural and remote farms are from a hospital or doctor and what further issues this could cause.
- Students research both the Farm Safe Australia and Royal Flying Doctor Service to find out how to stay safe on a farm and how to get help in remote Australia. Students present their findings to the class.

SUGGESTED RESOURCES:

Farm Safe Australia. <http://farmsafe.org.au/Keeping-Kids-Safe-on-Farms>

Royal Flying Doctor Service. <https://www.flyingdoctor.org.au/>

WHAT IS BIOSECURITY?

"Bio" refers to life and living things. It is from the Greek word "bios". Can you think of any other "bio" words? Biography, biology, biodiversity, bioaccumulation! "Security" refers to protection from risk or danger. The word originates from the Latin language in the 1400s! Can you think of any synonyms for the word "security"? (Safeguard, protection).

"Biosecurity" is therefore the protection of living things from some sort of risk or danger. For food production systems (where plants and animals are produced to make food or fibre), biosecurity generally refers to practices that help reduce the likelihood of pests and diseases being introduced, established, or spread.

- Brainstorm with students about any animal pests or diseases they know?
- Brainstorm examples of biosecurity practices that you may be using in your own home such as; vaccinating animals, worming animals, cleaning animal bedding, hand washing routine after contact with animals or soil and before eating, pest control and weeding.
- Research why it is so important to wash your hands after going to the toilet and each time before eating even in your own home!
- Ask students to work in groups to workshop the question: How can the chance of cross-infection from family pets or the backyard garden be minimised?
- Create posters to display in the classroom or school.

SUGGESTED RESOURCE:

www.csiro.au/en/Research/BF/Areas/Protecting-Animal-and-Human-Health/Zoonotic-capability





CAN I GET SICK FROM AN ANIMAL?

Zoonoses (plural) are animal diseases that can be transmitted to humans. 'Zoonosis' comes from the Greek words zoon (animal) and osis (ill). Some examples of zoonoses are Ross River Virus, Q Fever and Tetanus.

- Discuss which types of people would be most at risk of contracting a zoonosis? Think about people working closely with animals, such as farmers, abattoir workers, shearers, vets and people with low immunity.
- Discuss that prevention is better than cure. Risks of human infection can be substantially reduced through some simple strategies. Whilst biosecurity practices can't rule out a pest or disease outbreak altogether, the risk can be minimised by precautions from owners, transport operators and venue organisers. If details are recorded about farm animal movements, each animal can be traced and then any possible problem can be isolated more effectively to limit spread.

CASE STUDY: BIOSECURITY IS AT THE SYDNEY ROYAL EASTER SHOW

These strategies are implemented at the Sydney Royal Easter Show to protect humans and animals from infection.

- Hand washing stations: If you visit the Sydney Royal Easter Show, you will notice hand washing stations in many of the pavilions, particularly where there is an opportunity to touch animals. Hand washing using soap and running water, followed by drying hands with a paper towel is the best preventative measure to protect against transferable microbes.
- Animal health declarations: These are used by owners of livestock who are showing their animals and entering them in competitions. An animal health declaration is a checklist that can be used to determine the level of biosecurity risk. Basically, each animal must be clearly identified, the details of the property's the animals are leaving from and going back to need to be noted, the owner declares the animals are in good health and behaving normally, and that equipment that has come into contact with stock has been cleaned and disinfected.

Education is the key to keeping our population safe from zoonotic diseases.

- Students work in groups to create an advertising campaign using media of their choice. Have them think about bill boards, signage at local Agricultural Shows and jingles used in advertising. Lead them to think about different forms of poetry that can be used to create a catchy rhyme or lyric.

There is a great YouTube released late in 2017 <https://www.youtube.com/watch?v=Y3fLEIldXrE> The Australian Government Department of Agriculture and Water Resources is proud to be partnered with so many Indigenous Ranger groups across northern Australia as the 'frontline' defence, monitoring over 10,000 km of sparsely populated coastline and preserving our unique land and sea environments to help protect it from pests, weeds and diseases for generations to come.

Teachers can look at a great unit of work that will help facilitate student understanding of farm biosecurity that can be found at the links below.

SUGGESTED RESOURCES:

Cattle and Sheep Farming Unit of Work: <https://www.forteachersforstudents.com.au/site/themed-curriculum/cattle-sheep-farming/lesson-ideas/>

Cattle and Sheep Farming Biosecurity Worksheet: <https://www.forteachersforstudents.com.au/site/wp-content/uploads/MLA/CattleSheep/pdfs/mla-biosecurity.pdf>



IS THAT A WEED OR A PLANT?

Prior to settlement, Australia consisted of only native plants and animals. Many of the plant and animal pests that are now problems were accidentally or deliberately introduced in the early years of Australian settlement.

- Look up and discuss what the difference is between the words 'introduction', 'establishment' and 'spread' in relation to pests and disease? Can you think of any weeds, insects, or diseases that affect plant growth? Think of the school garden or oval and conduct a walking tour if possible to find some examples.
- Research a common plant pest and/or a common animal pest, including details of how and when it was introduced into Australia.
- Extend students understanding by thinking about some possible ways that pests and diseases could be introduced into food production systems, or spread between places? Consider wind, water, shoes, vehicles and animals. Investigate some features of weed seeds and how they aid in dispersal. E.g. weeds that use wind dispersal often have wings or parachute-type structures, weeds can also use water transport and are designed to float, or in the case of animal dispersal the seeds might have structures such as hooks or spines that attach to the fur or hide of animals and then dropped randomly in different places.
- Students create lists of pests and diseases and illustrate.

SUGGESTED RESOURCES:

DPI: List of notifiable plant pests and diseases relevant to New South Wales plant production industries and the environment. <http://www.dpi.nsw.gov.au/biosecurity/plant/notifiable-list>

Invasive Species Council. <https://invasives.org.au/>

Pest Smart. www.pestsmart.org.au

Common Invasive Plants in Australia. http://www.iewf.org/weedid/All_common_name.htm

<http://panique.com.au/trishansoz/animals/australia-introduced-animals.html>

The MyPest guide app developed by the Department of Agriculture and Food could be used to identify plant pests in the school garden.

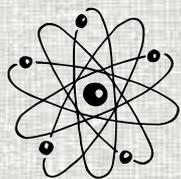
STEM PROJECT

Seed Design

- Design and make a weed seed that uses wind, water, or animals for transport. Create a 3D model to demonstrate the spread of the weed into new agricultural land or bushland. Label the diagram highlighting the features and their functions. Test and modify your design as you go. If possible, conduct an experiment to see how far your seed could travel. From this experiment, hypothesise how the introduction of your seed could impact on both agricultural land and native bushland. What season would this be a problem in? Include steps or plans of how to manage the spread of this seed into new areas.

FARMING - THE BIG QUESTIONS

from the beginning to our tech savvy future



WHY IS IT IMPORTANT TO GROW FOOD AND FIBRE SUSTAINABLY?

Sustainability is a very common word used across many areas of our daily lives. To unpack this word with your students, break the word up into two: Sustain/ability. Sustain – to keep something going for a long time– ability – your able to do something about it.

- Brainstorm and record students' ideas about why we need to look after our planet, such as;
 - The Earth is our home we live on
 - It provides us with ground to run on and air to breath
 - The Earth is a living thing
 - It provides us with food, water, and products for shelter and clothing
- Follow on with a discussion and record some of the problems facing our planet. First find out what the students think are current issues on a global scale and fill in any gaps in their knowledge so the list includes;
 - Pollution (land, air & water)
 - Cutting down too many trees (deforestation – trees help create the air we breathe)
 - Using too much energy that is not renewable (burning fossil fuels)
 - Climate Change (increased temperature and rising sea levels)

Looking at some of the issues facing our planet can be distressing so it is time now to turn the conversation around and look at what students can (and in some cases already are doing) to make sure we are living our lives in a sustainable way.

Students should have good knowledge about recycling reducing & reusing. Other ideas could include;

- Turning off lights when not needed and don't leave your electronic devices on stand-by
- When possible, walk or ride to your destination instead of asking for a lift.
- When possible, wear your clothes more than once before you wash them
- Turn off taps when cleaning your teeth and have four-minute showers
- Limit take away food, excess packaging and gimmick toys
- Become a member of a community garden or where possible grow them in your own yard

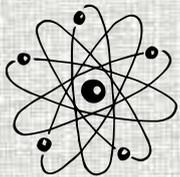
So, why is it important for farmers to grow our food and fibre sustainability?

All food and fibre production relies on land, water and energy to produce, process and distribute food. All human activity, including farming impacts on the environment. It is important that farmers are protecting the land, water and air for future generations while producing healthy food and fibre for a growing population.

- Research what farmers do to create and maintain a sustainable farm and outline their actions so the impact is minimal by using smart tech savvy methods of production. Farmers often work with industry, researchers and government to develop better methods of production.
- Students use or draw maps of farms and show some of the ways farmers are practicing sustainable farming.

Link Target 100: Future Foods Science and Sustainability Years 5-6 Primary Guide

<https://www.goodmeat.com.au/education-resources/#>



BIODIVERSITY

Biodiversity can be referring to the variety of living things globally, or the number or abundance of different species living within one region. It has an important role to play in maintaining balance of the ecosystem, provision of biological resources and social benefits. Fewer than 20 animal and plant species now provide most of the world's food and just 3 crop plants, wheat, rice and maize, supply more than half of the world's food energy.

- Research what are the 20 animal and plant species that provide the most food globally and find out why. Then look at how seed is stored in seed banks and discuss what is their purpose.
- Investigate varieties of fruit and vegetables grown commercially and those that were previously popular such as heirloom varieties.
- Choose one other food product that you believe should be included as a major food source in the future and why.

SUGGESTED RESOURCES:

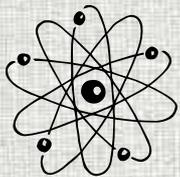
YouTube explaining Biodiversity: <https://www.youtube.com/watch?v=ErATB1aMiSU>

Staple Foods National Geographic: <https://www.nationalgeographic.org/encyclopedia/food-staple/>

Seed Banks: <https://borgenproject.org/seed-banks-importance-for-the-world/>

ABC BTN Seed Banks: <https://www.abc.net.au/cm/lb/11241734/data/angered-seeds---teacher-resource-%28pdf%29-data.pdf>

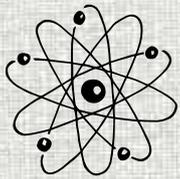
Heirloom Vegetables The Diggers Club: <https://www.diggers.com.au/shop/vegetables/>



GLOBAL FOOD SECURITY

The Food and Agricultural Organization for the United Nations states that food security exists 'when all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs for an active and healthy life'. The world's population between 1050 & 2010 increased from 2.5 to 6.9 billion people and by 2050 it will be over 9 billion people.

- Locate a variety of Food Security Infographics for students to work from. Work in groups to discuss what will need to change for our farmers to produce enough healthy food while protecting the environment for the world's population in 2050. Groups then pool all their ideas before deciding on a class project or performance to highlight their best ideas and main concerns for feeding our growing population.



GLOBAL WARMING/CLIMATE CHANGE

According to some climate change experts, moderate increases in temperatures (1-3°C), along with increased carbon dioxide in the atmosphere and rainfall changes, could benefit crop yields for some regions. However, warming of more than 3°C would have detrimental effects for all regions. Most Climate scientists agree we are experiencing climate change. Many scientists speculate the production of greenhouse gases are caused by human activity. Globally agriculture is one of the contributors to green house gas emissions through land clearing, methane releases from livestock, soil disturbance, use of machinery and chemicals, food transportation and waste.

- Lead a discussion about how there are many points of view about global warming and climate change and brainstorm some reasons for so many different reasons for this and whether it is or is not happening. Challenge students to explore all the different industries apart from agriculture that contribute to gas emissions, land clearing, soil disturbance and habitat loss.

SUGGESTED RESOURCE:

https://www.youtube.com/watch?v=u9s_A0G7oUU



FOOD MILES

Bananas can travel more than 2,500 kilometres by road from northern Australia to reach customers in Melbourne.

- Students bring in their favourite recipe that includes a fruit or vegetable in season (or provide some recipes such as fruit salad served in a cut out watermelon or fruit & veg on a kebab stick), and investigate where each of the products are grown. Calculate the kilometres each product has travelled to get to the student to determine the total food miles for their chosen recipe.

What advantages would there be for the consumer and for the state economy in buying NSW produce or shopping at local farmers markets? Can you think of any advantages in buying food produced in other states or countries?

- Design a survey to determine what the top three factors are for consumers purchasing a particular product.
- Choose three different products such as; fast food, fruit/vegetable or a drink. Is country of origin important, is the Logo remembered or is packaging and convenience the main selling point?
- Students design a new product range that could be grown, packaged and sold locally. It would be great if this product was grown in the school garden and sold to the local community. Students create a logo using a logo building app, a campaign, an advertisement, a video or web page promoting buying local food products highlighting the benefits to the consumer and economy and the environment.

SUGGESTED RESOURCES:

Sustainability Food Miles (Byron Bay): <https://www.youtube.com/watch?v=nnSjRw4Ck98>

Little Big Dairy Company in Dubbo - <https://www.youtube.com/watch?v=SbP4aE2236c>



FOOD QUALITY & THE IMPERFECT CROP

Farmers use a combination of subjective and objective measurements to know when their products are ready for market. Even in the classroom we have subjective and objective measurement. For example, a rain gauge is an example of an objective measurement, whilst student behaviour is subjective as it is a personal assessment - and may vary between people. As consumers, it is important to remember that the quality of agricultural products is largely determined by the season it experienced when it was growing. For example, it may have been drier than usual, wetter than usual, more pests than usual, or rained at an unusual time or experienced more frosts than usual... all of which can be measured objectively and may have impacted its quality as perceived by the consumer. Similarly after the produce leaves the farm gate, the care in transportation and manufacturing also affects the quality it arrives in to the consumer.

- Students research a food shortage and damaged crops due to a natural disaster such as a shortage of bananas after cyclone Yasi, tomatoes after cyclone Debbie or potatoes after flooding in our southern states. Discuss the consequences for both the farmer and the consumer.

CASE STUDY – HARRIS FARM MARKETS

- Discover how Harris Farm Markets chose to market some of their produce differently; making use of products that was previously thrown out because of consumer perceptions about quality. Discuss if you think this makes a difference and who it benefits?

https://www.harrisfarm.com.au/blogs/campaigns/116554629-imperfect-picks?gclid=CjwKEAjw6szOBRCF2sPTjfrJuXASJADDOLEFFVOgmUNi7wn40Kxzu-JobtUnLP3UWTwWNBtsRRpsARoCBQrw_wcB



FOOD WASTE

The media spotlight has been on Food Waste with a focus on reversing this issue. Food waste isn't just leftover food on our plates: it includes all food and resources wasted from farm to fork such as farm production, processing & manufacturing, retail & household. Each year, Australians waste about \$5 billion of food. The largest category thrown away in dollar terms is fruit and vegetables, closely followed by restaurant and takeaway food and then meat and fish. Households with higher incomes waste more food than those with lower incomes.

CASE STUDY – OZHARVEST

One of Oz Harvest's four pillars to direct the work that they do is FOOD RESCUE. 'Eliminating hunger and food waste through the redistribution of quality surplus food underpins everything we do. Our framework for food rescue now operates from eight cities and through regional communities across Australia, enabling OzHarvest to save millions of kilos of good food from landfill'.

- Students review their on-line information and summarise to present information to the class using their preferred media or style such as record a news story or create a digital presentation.

<http://www.ozharvest.org/what-we-do/our-story/>

- Students choose Food Waste, Packaging Waste or Clothing Waste as the basis of a project to find ways to reduce and reverse these trends.

SUGGESTED RESOURCES:

Behind the News: <https://www.youtube.com/watch?v=Y5smqZ9fTKY>

Plastic Packaging - Behind the News <https://www.youtube.com/watch?v=e4z7GKGBVYk>



URBAN FARMING – DO YOU HAVE SPACE FOR A COW OR A BEE IN YOUR BACKYARD?

NSW covers an area of around 800,642 sq kms and is home to approximately 7,739,300 people (ABS 2017). Agricultural land occupies 647,853 sq kms or around 80.92 per cent of the state. The most common land use by area is grazing native vegetation, which occupies 355,400 sq kilometres or 44.4 per cent of the state.

Space is one huge difference about growing food in your backyard to how farmers grow crops and raise animals for food and fibre.

- Students find out how much space is required to grow a tonne of fruit & vegetables or to raise one cow or sheep (don't forget to think about the amount of food a cow eats and drinks every day). Next, have students estimate how much space they have in their own backyard or balcony that could potentially house a farm animal such as chooks or grow some food. How long could you survive by eating what is produced from your garden, your school garden or a local community garden?
- Students research rooftop gardens in urban areas and the new trend of keeping bees in our cities. Look up how the Norwegians are building the largest greenhouses in the world to produce fresh food close to cities in managed environments.

Many governments promote the development of small-scale food processing enterprises because they:

- Have the potential to create significant levels of employment
- Increase food security for growing urban populations as well as rural families
- Produce products that can be a substitute for imported foods or have export potential, and thus help reduce balance of payments problems and improve the overall prosperity of the country

SUGGESTED RESOURCES:

ABC News: Urban beekeeping trending in Sydney as spring warms hives and bees get active <http://www.abc.net.au/news/rural/2017-09-02/urban-beekeeping-trending-in-sydney-as-springs-warms-hives/8852300>

ABC News: From concrete to cabbages: Sydney's new urban farms pop-up on city rooftops <http://www.abc.net.au/news/2016-02-03/sydneys-new-urban-farms-pop-up-on-city-rooftops/7104562>

Norwegian greenhouses: A sea of greenhouses surrounds a farmer's home in the Westland region of the Netherlands. The Dutch have become world leaders in agricultural innovation, pioneering new paths to fight hunger. <https://www.nationalgeographic.com/magazine/2017/09/holland-agriculture-sustainable-farming/>

STEM PROJECT

BOARD GAME – FARM TO TABLE

FARMING – THE BIG QUESTIONS

- As a class design and make a board game that reiterates that plant and animal production is a world full of risks and opportunities. For example: Positive events could include things like bumper crops, high prices, positive environmental outcomes, building community relationships. Negative events could involve things like adverse weather, destruction or loss of production by pests, low prices, poor quality, low yields, high bank fees or interest rates.

Students can work in groups or as individuals and be as creative as time allows. Depending on students and their skills, this could be digital or have some elements created on digital platforms. Set up a day or a couple of lunch times where students can invite other classes in to play the game.

Notes

