Year 5 Science & Technology Unit 2020

Living World – Adapting, Surviving & Sustaining

UNIT OVERVIEW

This unit focuses on the growth and survival of living things and how their adaptations over time suit their environment. Students investigate how and why food and fibre are produced in sustainable, managed environments that enable people to grow and be healthy. This strand further develops students’ knowledge and understanding of the environmental and biological sciences.

ST3-1WS-S Working Scientifically plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusions

ST3-2DP-T Design and Production plans and uses materials, tools and equipment to develop solutions for a need or opportunity

ST3-4LW-S Living World examines how the environment affects the growth, survival and adaptation of living things

ST3-5LW-T Living World explains how food and fibre are produced sustainably in managed environments for health and nutrition

ST3-7MW-T Material World explains how the properties of materials determine their use for a range of purposes

SKILLS FOCUS

Working Scientifically

Questioning and predicting
- pose testable questions
- make and justify predictions about scientific investigations

Planning and conducting investigations
- identify questions to investigate scientific ideas
- plan and apply the elements of scientific investigations to answer problems
- identify potential risks in planning investigations
- manage resources safely
- decide which variable(s) is to be changed, measured and kept the same, in fair tests
- select appropriate measurement methods, including formal measurements and digital technologies, to record data accurately and honestly (ACSIM087, ACSIS104)
- reflect on and make suggestions to improve fairness, accuracy and efficacy of a scientific investigation
- manage investigations effectively, individually and in groups

Processing and analysing data
- construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data
- employ appropriate technologies to represent data
- compare data with predictions
- present data as evidence in developing explanations

Design & Production

Identifying and defining
- examine and critique needs, opportunities or modifications using a range of criteria to define a project
- define a need or opportunity according to functional and aesthetic criteria for an audience
- consider availability and sustainability of resources when defining design needs and opportunities
- investigate materials, components, tools, techniques and processes required to achieve intended design solutions

Researching and planning
- research, identify and define design ideas and processes for an audience
- consider functional and aesthetic needs in planning a design solution
- develop, record and communicate design ideas, decisions and processes using appropriate technical terms
- produce labelled and annotated drawings including digital graphic representations for an audience
- consider sustainability of resources when researching and planning design solutions
- manage projects within time constraints

ASSESSMENT

Assessment: For/ As/ Of Learning

Phase One: Adapting & Surviving
- Leaf Investigation (Assessment For Learning)
- Impact of physical conditions on survival of plants (Assessment For Learning)
- 3,2,1 Bridge ongoing reflection (Assessment As Learning)
- Animal adaptation scientific report (Assessment For Learning)
- Generate Sort Connect Elaborate thinking routine (Assessment For Learning)
- Research and Design Solution Task (Assessment Of Learning)
- 3,2,1 Bridge reflection (Assessment As Learning)

Phase Two: Sustaining
- Converting Food to products research task (Assessment For Learning)
- Plan a healthy meal (Assessment Of Learning)
## Properties of materials determine their use → Why are the characteristics of materials important when designing and producing?

| ✓ investigate characteristics and properties of a range of materials and evaluate the impact of their use |
| ✓ identify and evaluate the functional and structural properties of materials |
| ✓ critique needs or opportunities for designing using sustainable materials |
| ✓ design a sustainable product, system or environment individually and/or collaboratively considering the properties of materials |
| ✓ select appropriate materials, components, tools, equipment and techniques and apply safe procedures to produce designed solutions |

### Units of Work:
- Science Web Australia: Survival
- Living Land Unit (developed by J. Finlay & K. Pascoe)
- Diocese of Cairns units
- 21st Century snapshot
- Thought-provoking Science (access via Scootle)
- Animal & plant adaptations – teacher resource

### Texts to support the unit:
- Song: This Land Australia (Ted Egan)
- The story of Rosy Dock by Jeannie Baker (connects to Year 5 History unit Australian Colonies)
- My Country by Dorothea Mackeller
- Circle by Jeannie Baker – teaching notes

## Adoptions of Living Things → How do the structural and behavioural features of living things support survival?

| ✓ describe adaptations as existing structures or behaviours that enable living things to survive in their environment |
| ✓ describe the structural and/or behavioural features of some native Australian animals and plants and why they are considered to be adaptations, for example: |
| ✓ shine surfaces of leaves on desert plants |
| ✓ rearward facing pouch of a burrowing wombat |
| ✓ spines on an echidna |

### Students:
- plan and conduct a fair test to show the conditions needed for a particular plant or animal to grow and survive in its environment
- describe how changing physical conditions in the environment affect the growth and survival of living things, for example:
  - Aboriginal Peoples’ use of fire-stick farming
  - temperature of water in aquatic environments
- test predictions by gathering data and use evidence to develop explanations of events and phenomena
- understand that scientific and technological knowledge is used to solve problems and inform personal and community decisions

## Sustainably managing environments to source food and fibre → Why is it important for food and/or fibre to be produced sustainably?

| ✓ explore examples of managed environments used to produce food and fibre, for example: |
| ✓ investigate how and why food and fibre are produced in managed environments |
| ✓ identify and sequence the process of converting ‘on-farm’ food and fibre products into a product suitable for retail sale |
| ✓ explore plants and animals, tools and techniques used to prepare food to enable people to grow and be healthy |
| ✓ plan, design and produce a healthy meal |
| ✓ explain a sustainable practice used by Aboriginal and/or Torres Strait Islander communities to manage food and fibre resources |
| ✓ investigate how people in design and technological occupations address considerations, including sustainability, in the design of products, services and environments for current and future use |

### Students:
- plan and conduct a fair test to show the conditions needed for a particular plant or animal to grow and survive in its environment
- describe adaptations as existing structures or behaviours that enable living things to survive in their environment
- describe the structural and/or behavioural features of some native Australian animals and plants and why they are considered to be adaptations, for example:
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- rearward facing pouch of a burrowing wombat
- spines on an echidna

### Resources:
- Adaptations and Survival interactive
- ABC Education: Animal and plant adaptations
- ABC Education: How plants survive in different locations
- ABC Education: Plant Leaves
- What does adaptation mean?
- Ted Egan Central Australia: The Eighth Wonder (long version) or (short version)
- Peach’s Explorers – East to West
- Australian Wildlife Video
- Swimming Crabs Video with a Queensland Museum expert
- Staying alive in the desert – Aboriginal uses of fire
- The Imagination Tree - Growing beans on cotton balls
- ABC Education – Cacti and succulents

This unit has been adapted from other units created by teachers at Our Lady of the Rosary, The Entrance (Nicole Mead, Jo-Anne Smith) as well as other external sources, including: Oakhill Drive PS unit of work, primary connections unit, Australian Science Teacher’s Association unit. Thanks to Steph Westwood, Vanessa Simpson and Kylie Borg for contributions and review of the unit.
TUNING IN TO THE INQUIRY - PHASE 1 (Adapting and Surviving)

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<td>- Examine a range of images, poetic and literary texts, as well as multimedia resources that evoke curiosity and wonder and how and why plants and animals can live in a range of harsh Australian environments. For example:</td>
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<td>- VIDEO: Australian Wildlife and Ted Egan Central Australia: The Eighth Wonder (long version) or (short version)</td>
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<td>- Artwork by Margaret Preston (National Gallery of Australia)</td>
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<td>- Poem ‘My Country’ by Dorothea Mackeller</td>
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<td>- Use the thinking routine <strong>Think Puzzle Explore</strong> to elicit background knowledge and wonderings – categorise these wonderings to fit into the two content areas Growth &amp; Survival and Adaptations</td>
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- How can we assess students’ prior knowledge and experience in relation to this context?
- How will we record this information for later assessment?
- What can we do to PROVOKE interest/enthusiasm/curiosity/motivation?
- How can we assist students to make “conceptual connections” and see relationships to and links with their own lives?
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<td><strong>Key Inquiry Questions</strong>&lt;br&gt;How do the structural and behavioural features of living things support survival? &lt;br&gt;How do physical conditions affect the survival of living things?  &lt;br&gt;• Examine a range of plants that live in different environments around Australia. Students categorise and classify the plants and provide an explanation of the specific features of each plant. &lt;br&gt;• Define the key terms adaptation, habitat, survival, environment, impact, change  &lt;br&gt;• Watch the Videos: Animal Adaptations and Adaptations in Action to examine how structural and behavioural adaptations assist an organism to function within its environment. Use the thinking routine The Explanation Game to name and explain the different types of adaptations and provide examples for each one.  &lt;br&gt; o Name: What is the adaptation?  &lt;br&gt; o Explain: How might you describe and explain what this adaptation is?  &lt;br&gt; o Examples: What examples can you give to support this adaptation?  &lt;br&gt;• Pose the question <em>What do you know about plants and how they survive?</em>  &lt;br&gt;Record initial student responses. The thinking routine 3, 2, 1 Bridge would be a useful tool to scaffold student thinking. This could then be revisited and added to after undertaking a range of learning experiences.  &lt;br&gt; o 3 things you think you know about how plants survive  &lt;br&gt; o 2 questions you have  &lt;br&gt; o 1 labelled diagram  &lt;br&gt;• As an introduction to plant adaptations, ask why some plants have thorns? As part of the discussion, connect the structural feature of thorns (an adaptation) that helps protect the plant from predators feeding on its leaves.  &lt;br&gt; o Watch the video ‘Meet Spiky, Thorny and Carnivorous Plants’ ABC Education  &lt;br&gt; o Identify other plant adaptations and discuss the purpose (function) of the adaptation  &lt;br&gt; o Describe the adaptations as a response to the plant meeting its needs of space, water, light, nutrients and ability to reproduce or to limit predation.  &lt;br&gt; o Sketch some of the different plants and label the parts that make these plants ‘great survivors’.  &lt;br&gt;• Watch the video Plant Leaves ABC Education and identify how leaves make their own food and transport energy to the rest of the plant.</td>
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### Adapts of Living Things

**Students:**

- ✓ describe adaptations as existing structures or behaviours that enable living things to survive in their environment
- ✓ describe the structural and/or behavioural features of some native Australian animals and plants and why they are considered to be adaptations

### Growth and Survival of Living Things

**Students:**

- ✓ plan and conduct a fair test to show the conditions needed for a particular plant or animal to grow and survive in its environment
- ✓ describe how changing physical conditions in the environment affect the growth and survival of living things
- ✓ test predictions by gathering data and use evidence to develop explanations of events and phenomena
- ✓ understand that scientific and technological knowledge is used to solve problems and inform personal and community decisions

#### Key Inquiry Questions

**How do the structural and behavioural features of living things support survival?**

**How do physical conditions affect the survival of living things?**

- □ What is a fair test and what are the scientific variables?
  - Watch [Scientific Variables](https://www.youtube.com/watch?v=0A55QRYJHPM) and discuss the 3 variables (dependent, independent and control).

- ❖ Take a tour of the school grounds and collect samples of different types of plant leaves (NB: it may be useful for teachers to gather other examples for this experiment, e.g. succulent leaves). Use annotated drawings and record notes about the leaves. The thinking routine [See Think Wonder](https://www.youtube.com/watch?v=0A55QRYJHPM) would help students as they undertake this exploration.
  - o What do you see, observe or notice about these plants and their features?
  - o Why do you think it grows like this or in this location? What structural or behavioural features help it to survive in this environment?
  - o What questions or puzzles do you have?

**Students investigate the link between water retention and leaf surface area in small groups by enclosing different leaves in plastic bags – (NB: 1 bag with no leaves needed). This can be done on the plant itself or with the leaves removed**

- o Define the key terms water retention, surface area, condensation, drought
- o Gather a range of leaves from home and they were laid out on the floor of the classroom. Made verbal observations about the differences between the leaves - look/ feel/ smell and drew some initial conclusions as to why this might be - photosynthesis, climatic differences, responses to seasons
  - □ Hypothesis  – What do you think will happen? Explain why
  - o Choose one leaf from the pile and sketch it, label its key features such as colour, texture, size, shape. Students bag the leaf in a zip lock bag and place them on the back wall to create a ‘Leaf Museum’.
  - o [Day Two & Onwards] – record the appearance of the bag contents using an annotated drawing, including the date and time of observation. Students need to pay particular attention to the amount of condensation that builds in the bag compared to the size of the leaves. Students make predictions about why they think these differences are occurring. Conduct observations over a 3-4 week period to be able to explore discolouration, mould growth, plant growth and condensation.
  - o Use 4 guiding questions to help students unpack their thinking around this investigation, including: [Assessment For Learning](#)  
    - ▪ What did you notice about your leaves?
    - ▪ What do you notice about the other leaves?
    - ▪ Why might there be a noticeable difference between some of the plants?
    - ▪ Why might some bags have water droplets? What do you think this means?
  
**Students document thinking on post-it notes in order to capture learning**

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**Resources:**

- ☑ VIDEO: Scientific Variables  
  https://www.youtube.com/watch?v=0A55QRYJHPM
- ☑ clipboards  
- ☑ Science books  
- ☑ variety of plant leaves  
- ☑ zip lock bags  
- ☑ permanent markers  
- ☑ Science journals  
- ☑ Investigation planner (appendix)

**Alice Vigors - 2020**
### Adaptsions of Living Things

**Students:**
- ✓ describe adaptations as existing structures or behaviours that enable living things to survive in their environment
- ✓ describe the structural and/or behavioural features of some native Australian animals and plants and why they are considered to be adaptations

### Growth and Survival of Living Things

**Students:**
- ✓ plan and conduct a fair test to show the conditions needed for a particular plant or animal to grow and survive in its environment
- ✓ describe how changing physical conditions in the environment affect the growth and survival of living things
- ✓ test predictions by gathering data and use evidence to develop explanations of events and phenomena
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### LEARNING AND TEACHING: SHARED INQUIRY

#### Key Inquiry Questions

**How do the structural and behavioural features of living things support survival?**

**How do physical conditions affect the survival of living things?**

- Investigate the impact of different physical conditions on the survival of plants using supporting inquiry question: How do different physical conditions impact the survival of plants? Plant 5 beans or 5 small plants in clear plastic cups – depriving 4 of one of the essential elements needed for survival
  - Identify what students already knew about optimal plant conditions
  - Discuss ways to narrow down the IQ to be more specific about the conditions we would address through the development of supporting questions.
  - **Hypothesis** – What do you think will happen? Explain why.
  - **Variables** –
    - What will be the dependent variable? What are you going to measure?
    - What will be the independent variable? What are you going to change?
    - What variables will you need to control? What will you need to keep the same?
  - **Observe** the plants over the next one to two weeks, using annotated drawings and capturing images to record changes and growth.
  - **Measure and compare** the growth of the plants over the course of two weeks using an appropriate unit and measuring device. Students are encouraged to estimate first before measuring and describe how a length was estimated and measured. Graph the results and include an explanation of findings.
  - **Pose the claim:** Changing the physical conditions in the environment affects the growth and survival of living things. Use the collected evidence and knowledge about adaptations that might impact growth and survival of living things, in particular plants. Annotated drawings, pictures and data can be used to support explanation. The thinking routine **Claim Support Question** would be useful to help scaffold student thinking. ([Assessment For Learning](#)) ([Resource 1](#)) ([Resource 2](#))

- Re-examine the 3, 2, 1 Bridge from earlier in the learning sequence and compose new responses. Then examine the learning that has supported their growth in understanding ([Assessment As Learning](#))

### EVALUATION

- Re-examine the 3, 2, 1 Bridge from earlier in the learning sequence and compose new responses. Then examine the learning that has supported their growth in understanding ([Assessment As Learning](#))

### RESOURCES

- Core Electronics: Soil Moisture Sensor ([Resource 1](#))
- Make Code: Soil Moisture Sensor ([Resource 2](#))
- Micro:bit with battery pack (1ea)
- Long nails (2ea)
- Crocodile clips (2ea)
- Lima bean, butterbean or cress seeds
- Clear plastic cups
- Spray bottle or watering can
- Soil
- Permanent marker and/or paddle pop stick
- Zip lock bag
### Key Inquiry Questions

**How do the structural and behavioural features of living things support survival?**

**How do physical conditions affect the survival of living things?**

- **Research** and describe the structural and/or behavioural features of some native plants and animals and describe why they are considered adaptations. Some prompts may include:

  **LINK: English**
  - What kind of environment does this plant or animal live in?
  - How has this animal or plant adapted to suit its environment?
  - Identify and describe the adaptations as a structural and/or behavioural feature.
  - How does this adaptation help this living thing to survive?
  - How might this adaptation differ according to the environment in which they live?
  - What could happen to this adaptation if the environment changed in some way?

**NB:** teachers may like to take a local perspective to allow students to make local connections.

- **Bar-tailed Godwit** (migratory behaviour from Alaska to Australia, including local lake Tuggerah Lakes).
  - Australian Museum
  - Birdlife Australia
  - The text *Circle* by Jeannie Baker explores this migration journey
- **Swimming Crabs & Mud Crabs** (structural adaptation of swimming paddles and placement of teeth, behavioural adaptation of shedding shell)
  - Queensland Museum
  - Video
  - NSW Department of Primary Industries
  - WA Department of Fisheries
  - Shedding shell Video
- **Mangroves** (structural adaptation of ‘breathing’ roots)
  - NSW Department of Primary Industries
  - NSW Ecosystems on Show - mangroves
  - Excursion possibility: Visit Carawah Reserve, Gosford to examine the mangrove & wetland environments and explore the adaptations made by the plants and animals that live there. Mud crabs are also present in this environment.
- **Spinifex Grass** - found on sand dunes (structural adaptation of each shoot has own water supply, behavioural adaptation of releasing seeds after rain
  - Biology weebly
  - Spinifex powerpoint
- Other examples include those suggested in the Syllabus, such as shiny surfaces on leaves in the desert, rearward facing pouch of a wombat and spines on an echidna (**NB:** teachers could also link in Indigenous dreamtime stories to support this).

**Presentation:** present information in a detailed & informative scientific report that answers the research prompts (**Assessment For Learning**) (ST3-1WS-S and ST3-4LW-S)

### Evaluation

- **devices:** iPad/Chromebook/tablet

- **Circle by Jeannie Baker**

- **NB:** The following research task could also examine how introduced species have adapted to the harshness of the Australian environment – link to History
## Adaptations of Living Things

**Students:**

- ✓ describe adaptations as existing structures or behaviours that enable living things to survive in their environment
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## Growth and Survival of Living Things

**Students:**

- ✓ plan and conduct a fair test to show the conditions needed for a particular plant or animal to grow and survive in its environment
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- ✓ understand that scientific and technological knowledge is used to solve problems and inform personal and community decisions

### Key Inquiry Questions

**How do the structural and behavioural features of living things support survival?**

**How do physical conditions affect the survival of living things?**

- ✤ Use the thinking routine **Generate Sort Connect Elaborate** to examine and unpack the following questions:
  - o What is a wetland environment? What kind of living things live in wetlands?
  - o What adaptations do they have that enable them to survive in these environments?
  - o How might a change in a wetland environment impact living things?
  - o What happens to those that cannot adapt to the conditions?
    - • **Generate** a list of ideas or thoughts that come to mind when exploring these questions. Record your thinking of small post-it notes
    - • **Sort** your ideas according to environments, adaptations and impact due to change. Place environments closest to the centre with related adaptations as a middle layer and impacts as an outer layer.
    - • **Connect** your ideas by drawing connecting lines between ideas that have something in common. Explain and write in a short sentence how these ideas are connected.
    - • **Elaborate** on any ideas/thoughts you have written by adding new ideas that expand/extend/add to initial ideas – **NB:** a gallery walk may be useful at this point in time.

(Assessment For Learning) (ST3-1WS-S and ST3-4LW-S)

**Examine a range of images of birds that inhabit the local wetland environment. Discuss ways they get food and water, what they may use for shelter and what might be the threats to their survival in this environment.** **NB:** this could link to a research task in English.

**Excursion:** Undertake an excursion to the local wetland or estuary environment and view the habitat and possible nesting sites of a range of different birds that inhabit that environment. Take field notes, photographs, videos etc of how different birds live and interact in this environment.

**NB:** This could link in with the Year 5 Geography (factors that Shape Places) excursion to the local estuary environment

### Resources

- ✝ wetland fact sheet
- ✝ large paper (A3+)
- ✝ post-it notes
- ✝ Range of bird images
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### LEARNING AND TEACHING: SHARED INQUIRY

#### Key Inquiry Questions

- How do the structural and behavioural features of living things support survival?
- How do physical conditions affect the survival of living things?

#### Design & Produce Task (continued):

- Plan, rehearse and deliver research and design solution to an audience
  - Select and sequence appropriate information and multimodal elements suitable for the intended audience and purpose
  - Make appropriate choices for modality and emphasis during the presentation
  - Vary conventions of spoken interactions to engage the audience
  - Communicate design ideas, decisions and processes using appropriate technical terms
  - Assess their own and others’ presentations against a co-constructed criterion
  - Formulate questions, in response to presentations, for specific purposes, e.g. to clarify and reflect
- Engage in a gallery walk to examine the research and design solution of others. Students gather information from 2-3 other students using an adapted 3.2.1 Bridge thinking routine:
  - What are 3 interesting facts about the bird?
  - What are two questions you have?
  - What is one way this bird is similar or different to your bird?

### EVALUATION

### RESOURCES

(Assessment Of Learning & Assessment As Learning) (ST3-1WS-S, ST3-2DP-T and ST3-4LW-S)
### TUNING IN TO THE INQUIRY - PHASE 2 (Sustaining)

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- **Tuning In Tasks:**
  - Examine an image or images of agriculture and farming in Australia. Use the thinking routine **See Think Wonder** to help scaffold student thinking.
    - What do you see, observe or notice?
    - How do you think you are connected to agriculture and farming?
    - What do you wonder?

- **Reviewing Tuning In Data**
  - **How can we assess students’ prior knowledge and experience in relation to this context?**
  - **How will we record this information for later assessment?**
  - **What can we do to PROVOKE interest/enthusiasm/curiosity/motivation?**
  - **How can we assist students to make “conceptual connections” and see relationships to and links with their own lives?**

- **Suggested Tuning In Tasks:**
  - Share and discuss student thinking about agriculture and farming. Further prompting may assist this discussion:
    - Are you connected through the food you eat? through the clothes you wear?
    - What other products do you use that comes from a farm?
    - Have you ever grown your own food or kept animals, like chickens?
<table>
<thead>
<tr>
<th>CONTENT</th>
<th>LEARNING AND TEACHING: SHARED INQUIRY</th>
<th>EVALUATION</th>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why is it important for food and/or fibre to be produced sustainably?</td>
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<tr>
<td>Students:</td>
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<tr>
<td>✓ explore examples of managed environments used to produce food and fibre, for example:</td>
<td></td>
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<tr>
<td>− cattle farms</td>
<td></td>
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<tr>
<td>− timber plantations</td>
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<tr>
<td>✓ investigate how and why food and fibre are produced in managed environments</td>
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**Key Inquiry Questions**

**Why is it important for food and/or fibre to be produced sustainably?**

- Examine the clip *From the Paddock/ Ocean to the Plate*

- Discuss the key ideas presented in the clip. Students think, pair, share where they think the breakfast they ate this morning might come from.

- Define and display the key terms *agriculture*, *farming*, *food*, *fibre*

- Investigate different types of managed environments used for agriculture and farming.

- Examine a range of images, clips or other sources that depict a variety of ways agriculture occurs in managed farming environments

- Explore Tocal Farms (*K-6 Resource*)

- Examine ways Tocal Farms is managed to support Beef cattle, Dairy, Eggs and Sheep production. (*K-6 Resource*)

  - In what ways do farmers manage the environment?
  - Why might this management be important?

- Videos to support this exploration:

  - The Dairy at Tocal Farm 360 *clip*
  - Beef Cattle at Tocal Farm *clip*
  - Free-range eggs at Tocal Farm *clip*
  - Sheep at Tocal Farm *clip*

- Explore a range of other useful clips that show different managed environments, such as:

  - Lamb Paddock to Plate VR *clip*
  - Wheat Harvest Experience 2D VR *clip*
  - Belgenny Farms Creamery VR *tour*

- Examine how technology has been used to enhance the agricultural industry

  - What might be the positive impact of technology in agriculture?
  - What might be the downfalls to the use of technology in agriculture?

  - Video: *Technology in AgriBusiness*
**Key Inquiry Questions**

**Why is it important for food and/or fibre to be produced sustainably?**

- Students:  
  - ✓ explore examples of managed environments used to produce food and fibre, for example:  
    - cattle farms  
    - fish and oyster farms  
    - timber plantations  
  - ✓ investigate how and why food and fibre are produced in managed environments  
  - ✓ explain a sustainable practice used by Aboriginal and/or Torres Strait Islander communities to manage food and fibre resources

- Farmers talk about sustainable practices on their farms to help make them viable long term. Investigate what sustainability is, how it applies to farming and how Aboriginal and Torres Strait Islander people use sustainable practices to manage resources.
  - What is sustainability?
    - Examine the video clip that explains sustainability through a fairytale. Students use note-taking skills to record key pieces of information. The +1 thinking routine would be a useful support for this process.
    - Define and display the key term sustainability
  - Why is it important that farmers think sustainably on their farms?
    - Analyse world population growth data and food consumption data, and answer a range of questions (pg 9-11 Future Foods) (LINK: Mathematics)

- How might Aboriginal and Torres Strait Islander people use sustainable practices to manage resources?
  - Developing bush tucker into a seed crop (ABC education)
    - How would you describe when and how the seeds are collected?
    - Neville Bonney has been investigating wattleseed for over forty years, but for thousands of years wattleseed has been a valued food source for Aboriginal people. Why might European settlers have been unaware of the potential of wattleseed as a food source?
  - Aboriginal Agriculture and Ingenuity: Chapter 9 Aquaculture
    - How did Indigenous people manage the environment at Lake Condah?
    - What evidence is there of eel traps and preservation for ‘trade’?
    - How did Indigenous people use technology to assist them in the agricultural process?
    - How has Science given us a greater understanding of past agricultural practices?

- Compose a persuasive text about sustainability in agriculture and farming in Australia and/or around the world (LINKS: English)
  - Presentation ideas: written text, persuasive TV ad, podcast, digital book, recorded interview

- Examine the clip Where does our food come from? Tomatoes
  - Use the thinking routine Think Puzzle Explore as a tool to engage students in dialogue about their understanding of where their food comes from and how it gets to us.
    - What do you think you know about where your food comes from and how it gets to us?
    - What questions or puzzles do you have?
**Key Inquiry Questions**

**Why is it important for food and/or fibre to be produced sustainably?**

- How might we explore the process of how food gets to us?

- Define and display the key term *supply chain*.

- Examine the simple supply chain of the potato chip (see Appendix 2). Pairs or small groups use their current knowledge of supply chains, farming and agriculture to explain what they think might be happening at each phase of the process and share their thinking with the class.

- Investigate the process of converting ‘on farm’ food and fibre into products we see at the shops/supermarket today. (*Assessment For Learning* (ST3-1WS-S, ST3-5LW-T))

- Pairs research an Australian food or fibre product using a range of sources, such as:
  - Broccoli
  - Rice
  - Milk
  - Honey
  - Fish Fingers
  - Pineapples
  - Sweetcorn
  - Cotton
  - Tissue
  - Banana
  - Wool

- Identify the different phases in the supply chain.

- Explain the different phases of the supply chain, identifying examples of or opportunities for sustainable practices in the managed environments. Explanation supported by the use of appropriate graphics.

- Present supply chains to others in an engaging and creative way, such as documentary, infographic, podcast, website, blog post, informative article (*LINKS: English*)

- Pose the question *What makes a meal healthy?* (*LINK: PDH*)

- Examine the Australian Guide to Healthy Eating diagram (Appendix 3). Discuss how the Australian Guide to Healthy Eating help you work out what foods you can include in your lunchbox and how eating a food from each of the groups might make you healthy.

- Read *The importance of protein* text (pg 32-33 *Future Foods*)
  - Why is protein important to ensuring we stay healthy?
  - Examine and compare the nutritional information for cheddar cheese and lean beef (pg 37 *Future Foods*). Analyse the information through a series of questions
  - Investigate a range of food packaging
  - What kind of information is given on nutritional labels?
  - How do we know if the packaged food we consume is healthy for us?
  - BTN Episodes: *Food Labelling* & *Food Source*

- Plan, design and produce a healthy lunch, meal or snack that can be shared with others. (*Assessment Of Learning*) *(ST3-1WS-S, ST3-2DP-T, ST3-5LW-T)*
  - Suggest criteria for assessing the attributes of a healthy lunch, meal or snack.
  - Self-assess ‘healthy’ meal against the criteria and explore ways we might improve it next time.
**Resource 2 – Investigation Planner**

**Investigation Planner**

<table>
<thead>
<tr>
<th>Investigation Question</th>
<th>Hypothesis</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>What do you think will happen? Explain why.</td>
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</table>

To make the test fair what are you going to:

<table>
<thead>
<tr>
<th>Change?</th>
<th>Measure?</th>
<th>Keep the Same?</th>
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<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable</th>
<th>Control Variable</th>
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<table>
<thead>
<tr>
<th>Labelled Diagram</th>
<th>Equipment</th>
<th>Procedure</th>
<th>How will you complete the investigation?</th>
</tr>
</thead>
<tbody>
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</table>
## Resource 2 – Investigation Planner (cont.)

### Explaining Results

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you changed the ___________________________ what happened?</td>
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</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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</thead>
<tbody>
<tr>
<td>Why did this happen?</td>
<td></td>
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<td>Was your hypothesis accurate?</td>
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</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>What challenges did you have in doing this investigation?</td>
<td></td>
</tr>
<tr>
<td>How could you improve this investigation?</td>
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<tr>
<td>What would you investigate next?</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fairness? Accuracy?</td>
<td></td>
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</table>