


Year 5 Science & Technology Unit 2020

Living World – Adapting, Surviving & Sustaining

Term:	Three & Four	Duration:	15 weeks	Grade:	Five	Year:	2020
UNIT OVERVIEW				OUTCOMES			
<p>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.</p>				<p>ST3-1WS-S <i>Working Scientifically</i> plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusions</p> <p>ST3-2DP-T <i>Design and Production</i> plans and uses materials, tools and equipment to develop solutions for a need or opportunity</p> <p>ST3-4LW-S <i>Living World</i> examines how the environment affects the growth, survival and adaptation of living things</p> <p>ST3-5LW-T <i>Living World</i> explains how food and fibre are produced sustainably in managed environments for health and nutrition</p> <p>ST3-7MW-T <i>Material World</i> explains how the properties of materials determines their use for a range of purposes</p>			
SKILLS FOCUS				ASSESSMENT			
<p><i>Working Scientifically</i> <u>Questioning and predicting</u></p> <ul style="list-style-type: none"> ▪ pose testable questions ▪ make and justify predictions about scientific investigations <p><u>Planning and conducting investigations</u></p> <ul style="list-style-type: none"> ▪ 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 (ACSIS087, ACSIS104) ▪ reflect on and make suggestions to improve fairness, accuracy and efficacy of a scientific investigation ▪ manage investigations effectively, individually and in groups <p><u>Processing and analysing data</u></p> <ul style="list-style-type: none"> ▪ 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 		<p><i>Design & Production</i> <u>Identifying and defining</u></p> <ul style="list-style-type: none"> ▪ 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 <p><u>Researching and planning</u></p> <ul style="list-style-type: none"> ▪ 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 		<p>Assessment: For/ As/ Of Learning <u>Phase One: Adapting & Surviving</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Leaf Investigation (Assessment For Learning) <input type="checkbox"/> Impact of physical conditions on survival of plants (Assessment For Learning) <input type="checkbox"/> 3,2,1 Bridge ongoing reflection (Assessment As Learning) <input type="checkbox"/> Animal adaptation scientific report (Assessment For Learning) <input type="checkbox"/> Generate Sort Connect Elaborate thinking routine (Assessment For Learning) <input type="checkbox"/> Research and Design Solution Task (Assessment Of Learning) <input type="checkbox"/> 3,2,1 Bridge reflection (Assessment As Learning) <p><u>Phase Two: Sustaining</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Converting Food to products research task (Assessment For Learning) <input type="checkbox"/> Plan a healthy meal (Assessment Of Learning) 			

CONTENT

Growth and Survival of Living Things → <i>How do physical conditions affect the survival of living things?</i>	Adaptations of Living Things → <i>How do the structural and behavioural features of living things support survival?</i>	Sustainably managing environments to source food and fibre → <i>Why is it important for food and/or fibre to be produced sustainably?</i>
<p>Students:</p> <ul style="list-style-type: none"> ✓ 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: <ul style="list-style-type: none"> – 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 	<p>Students:</p> <ul style="list-style-type: none"> ✓ 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: <ul style="list-style-type: none"> – shiny surfaces of leaves on desert plants – rearward facing pouch of a burrowing wombat – spines on an echidna 	<p>Students:</p> <ul style="list-style-type: none"> ✓ explore examples of managed environments used to produce food and fibre, for example: <ul style="list-style-type: none"> - cattle farms - fish and oyster farms - timber plantations ✓ 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

CONTENT	RESOURCES	
<p>Properties of materials determine their use → <i>Why are the characteristics of materials important when designing and producing?</i></p> <ul style="list-style-type: none"> ✓ 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 	<p>Units of Work:</p> <ul style="list-style-type: none"> ▪ 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 <p>Plant Needs – Got Dirt?</p> <p>Texts to support the unit</p> <ul style="list-style-type: none"> ✓ Song: This Land Australia (Ted Egan) ✓ The story of Rosy Dock by Jeannie Baker (connects to Year 6 History unit Australian Colonies) ✓ My Country by Dorothea Mackeller <ul style="list-style-type: none"> ▪ Circle by Jeannie Baker – teaching notes 	<ul style="list-style-type: none"> ✓ 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)

Tuning In (Baseline 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:

- 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:
 - VIDEO: [Australian Wildlife](#) and Ted Egan Central Australia: The Eighth Wonder ([long version](#)) or ([short version](#))
 - Artwork by Margaret Preston ([National Gallery of Australia](#))
 - Poem ‘My Country’ by Dorothea Mackellar
- Use the thinking routine [Think Puzzle Explore](#) to elicit background knowledge and wonderings – categorise these wonderings to fit into the two content areas Growth & Survival and Adaptations

Reviewing Tuning In Data

(What did the tuning in tasks reveal to us about students' interests and needs? What questions did they pose that can help drive learning?)

CONTENT	LEARNING AND TEACHING: SHARED INQUIRY	EVALUATION	RESOURCES
<p>Adaptations of Living Things</p> <p>Students:</p> <ul style="list-style-type: none"> ✓ 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 <p>Growth and Survival of Living Things</p> <p>Students:</p> <ul style="list-style-type: none"> ✓ 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 	<p>Key Inquiry Questions</p> <p>How do the structural and behavioural features of living things support survival?</p> <p>How do physical conditions affect the survival of living things?</p> <ul style="list-style-type: none"> • 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. • Define the key terms <i>adaptation, habitat, survival, environment, impact, change</i> • 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. <ul style="list-style-type: none"> ○ <u>Name</u>: What is the adaptation? ○ <u>Explain</u>: How might you describe and explain what this adaptation is? ○ <u>Examples</u>: What examples can you give to support this adaptation? • Pose the question <i>What do you know about plants and how they survive?</i> 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. <ul style="list-style-type: none"> ○ 3 things you think you know about how plants survive ○ 2 questions you have ○ 1 labelled diagram • 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. <ul style="list-style-type: none"> ○ Watch the video 'Meet Spiky, Thorny and Carnivorous Plants' ABC Education <ul style="list-style-type: none"> ▪ Identify other plant adaptations and discuss the purpose (function) of the adaptation ▪ 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. ▪ Sketch some of the different plants and label the parts that make these plants 'great survivors.' • Watch the video Plant Leaves ABC Education and identify how leaves make their own food and transport energy to the rest of the plant. 		<ul style="list-style-type: none"> 🔗 Science books 🔗 plant images 🔗 VIDEO: Animal Adaptations (Scholastic) 🔗 VIDEO: Adaptations in Action (access via <i>Scootle: thought provoking Science – Yr5 biological science</i>) 🔗 VIDEO: Meet Spiky, Thorny & Carnivorous Plants 🔗 VIDEO: Plant Leaves

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TUNING IN TO THE INQUIRY - PHASE 2 (Sustaining)

Tuning In (Baseline 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:

- 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?



- 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?

Reviewing Tuning In Data

(What did the tuning in tasks reveal to us about students' interests and needs? What questions did they pose that can help drive learning?)

CONTENT	LEARNING AND TEACHING: SHARED INQUIRY	EVALUATION	RESOURCES
<p>Why is it important for food and/or fibre to be produced sustainably?</p> <p>Students:</p> <ul style="list-style-type: none"> ✓ explore examples of managed environments used to produce food and fibre, for example: <ul style="list-style-type: none"> - cattle farms - fish and oyster farms - timber plantations ✓ investigate how and why food and fibre are produced in managed environments 	<p>Key Inquiry Questions</p> <p>Why is it important for food and/or fibre to be produced sustainably?</p> <ul style="list-style-type: none"> ☐ Examine the clip From the Paddock/ Ocean to the Plate <ul style="list-style-type: none"> ☐ 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 <i>agriculture, farming, food, fibre</i> ☐ Investigate different types of managed environments used for agriculture and farming. <ul style="list-style-type: none"> ☐ Examine a range of images. clips or other sources that depict a variety of ways agriculture occurs in managed farming environments <ul style="list-style-type: none"> ☐ Explore Tocal Farms (K-6 Resource) ☐ Examine ways Tocal Farms is managed to support Beef cattle, Dairy, Eggs and Sheep production. (K-6 Resource) <ul style="list-style-type: none"> ☐ <i>In what ways do farmers manage the environment?</i> ☐ <i>Why might this management be important?</i> <ul style="list-style-type: none"> ☐ Videos to support this exploration: <ul style="list-style-type: none"> ☐ 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: <ul style="list-style-type: none"> ☐ 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 <ul style="list-style-type: none"> ☐ 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 		<ul style="list-style-type: none"> ☐ From the Paddock/ Ocean to the Plate You Tube clip ☐ Tocal Farms (K-6 Resource) ☐ DPI: Tocal Virtual Farm ☐ Landscapes on Tocal farm clip ☐ Tocal Farm images

CONTENT	LEARNING AND TEACHING: SHARED INQUIRY	EVALUATION	RESOURCES
<p>Why is it important for food and/or fibre to be produced sustainably?</p> <p>Students:</p> <ul style="list-style-type: none"> ✓ explore examples of managed environments used to produce food and fibre, for example: <ul style="list-style-type: none"> - 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 	<p>Key Inquiry Questions</p> <p>Why is it important for food and/or fibre to be produced sustainably?</p> <ul style="list-style-type: none"> ❑ 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. <ul style="list-style-type: none"> ❑ <i>What is sustainability?</i> <ul style="list-style-type: none"> ❑ 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 <i>sustainability</i> ❑ <i>Why is it important that farmers think sustainably on their farms?</i> <ul style="list-style-type: none"> ❑ Analyse world population growth data and food consumption data, and answer a range of questions (pg 9-11 Future Foods) (LINK: Mathematics) ❑ <i>How might Aboriginal and Torres Strait Islander people use sustainable practices to manage resources?</i> <ul style="list-style-type: none"> ❑ Developing bush tucker into a seed crop (ABC education) <ul style="list-style-type: none"> ❑ <i>How would you describe when and how the seeds are collected?</i> ❑ 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. <i>Why might European settlers have been unaware of the potential of wattleseed as a food source?</i> ❑ Aboriginal Agriculture and Ingenuity: Chapter 9 Aquaculture <ul style="list-style-type: none"> ❑ <i>How did Indigenous people manage the environment at Lake Condah?</i> ❑ <i>What evidence is there of eel traps and preservation for 'trade'?</i> ❑ <i>How did Indigenous people use technology to assist them in the agricultural process?</i> ❑ <i>How has Science given us a greater understanding of past agricultural practices?</i> ❑ Compose a persuasive text about sustainability in agriculture and farming in Australia and/or around the world (LINKS: English) <ul style="list-style-type: none"> ❑ Presentation ideas: written text, persuasive TV ad, podcast, digital book, recorded interview ❑ Examine the clip Where does our food come from? Tomatoes <ul style="list-style-type: none"> ❑ 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. <ul style="list-style-type: none"> ❑ What do you <u>think</u> you know about where your food comes from and how it gets to us? ❑ What questions or <u>puzzles</u> do you have? 		

CONTENT	LEARNING AND TEACHING: SHARED INQUIRY	EVALUATION	RESOURCES												
<p>Why is it important for food and/or fibre to be produced sustainably?</p> <p>Students:</p> <ul style="list-style-type: none"> ✓ 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 	<p>Key Inquiry Questions</p> <p>Why is it important for food and/or fibre to be produced sustainably?</p> <ul style="list-style-type: none"> <input type="checkbox"/> How might we <u>explore</u> the process of how food gets to us? <input type="checkbox"/> Define and display the key term <i>supply chain</i> <input type="checkbox"/> 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. <input type="checkbox"/> 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)) <ul style="list-style-type: none"> <input type="checkbox"/> Pairs research an Australian food or fibre product using a range of sources, such as: <table border="1" data-bbox="618 448 1341 628"> <tbody> <tr> <td>Broccoli</td> <td>Rice</td> <td>Milk</td> <td>Honey</td> </tr> <tr> <td>Fish Fingers</td> <td>Pineapples</td> <td>Sweetcorn</td> <td>Cotton</td> </tr> <tr> <td>Tissue</td> <td>Banana</td> <td>Wool</td> <td></td> </tr> </tbody> </table> <input type="checkbox"/> Identify the different phases in the supply chain <input type="checkbox"/> 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. <input type="checkbox"/> Present supply chains to others in an engaging and creative way, such as documentary, infographic, podcast, website, blog post, informative article (LINKS: English) <input type="checkbox"/> Pose the question <i>What makes a meal healthy?</i> (LINK: PDH) <ul style="list-style-type: none"> <input type="checkbox"/> 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. <input type="checkbox"/> Read <i>The importance of protein</i> text (pg 32-33 Future Foods) <ul style="list-style-type: none"> <input type="checkbox"/> Why is protein important to ensuring we stay healthy? <input type="checkbox"/> Examine and compare the nutritional information for cheddar cheese and lean beef (pg 37 Future Foods). Analyse the information through a series of questions <input type="checkbox"/> Investigate a range of food packaging <input type="checkbox"/> What kind of information is given on nutritional labels? <input type="checkbox"/> How do we know if the packaged food we consume is healthy for us? <input type="checkbox"/> BTN Episodes: Food Labelling & Food Source <input type="checkbox"/> Plan, design and produce a healthy lunch, meal or snack that can be shared with others. NB: Considerations should be given to student allergies. (Assessment Of Learning (ST3-1WS-S, ST3-2DP-T, ST3-5LW-T)) <ul style="list-style-type: none"> <input type="checkbox"/> Suggest criteria for assessing the attributes of a healthy lunch, meal or snack. <input type="checkbox"/> Self-assess 'healthy' meal against the criteria and explore ways we might improve it next time. 	Broccoli	Rice	Milk	Honey	Fish Fingers	Pineapples	Sweetcorn	Cotton	Tissue	Banana	Wool			<ul style="list-style-type: none"> <input type="checkbox"/> You Tube Channel: From Farm to Fork <input type="checkbox"/> Cotton: Field to Fabric <input type="checkbox"/> Field to Fabric Supply Chain <input type="checkbox"/> Wool: Farm to Fashion <input type="checkbox"/> Wool Processing <input type="checkbox"/> Tissue production
Broccoli	Rice	Milk	Honey												
Fish Fingers	Pineapples	Sweetcorn	Cotton												
Tissue	Banana	Wool													

Resource 2 – Investigation Planner

Investigation Planner

Name: Date:

Investigation Question	Hypothesis What do you think will happen? Explain why.
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To make the test fair what are you going to:

Change? Independent Variable	Measure? Dependent Variable	Keep the Same? Control Variable
Labelled Diagram	Equipment	Procedure How will you complete the investigation?

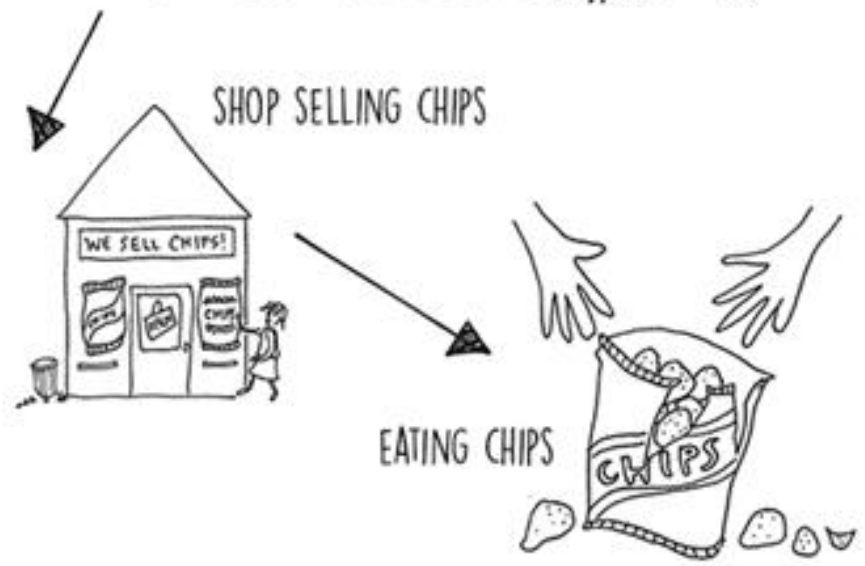
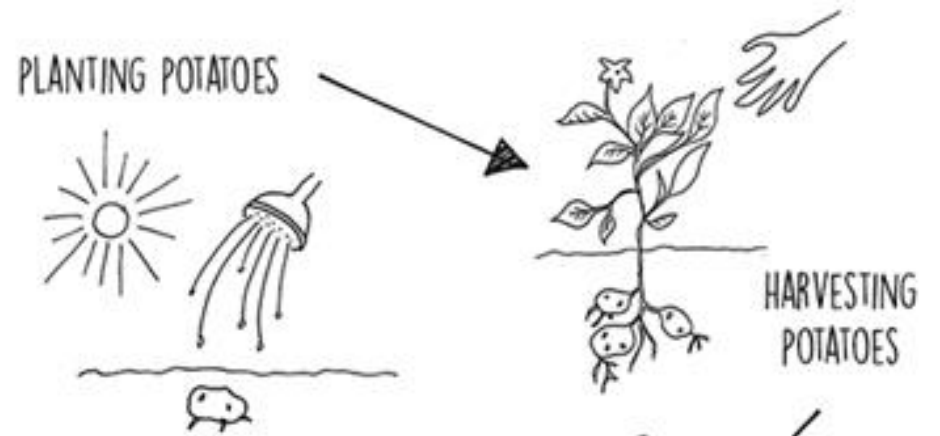
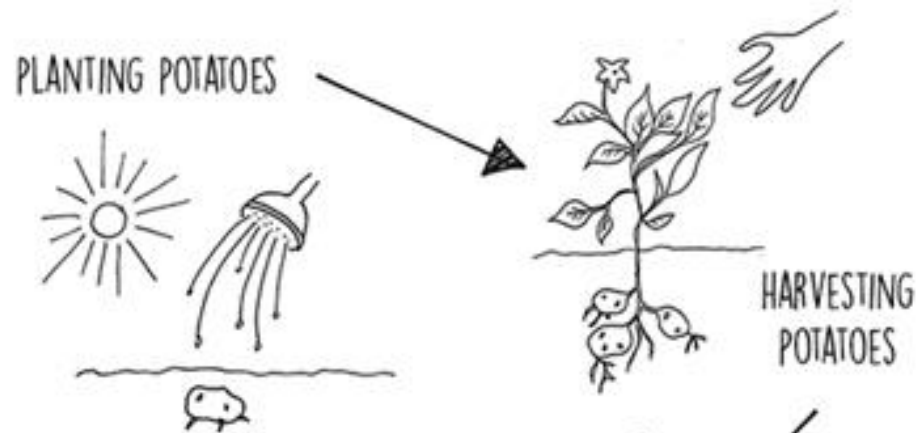
Resource 2 – Investigation Planner (cont.)

Explaining Results

When you changed the _____ what happened?	
Why did this happen?	Was your hypothesis accurate?
What challenges did you have in doing this investigation?	How could you improve this investigation? What would you investigate next? Fairness? Accuracy?

Teacher Comments:

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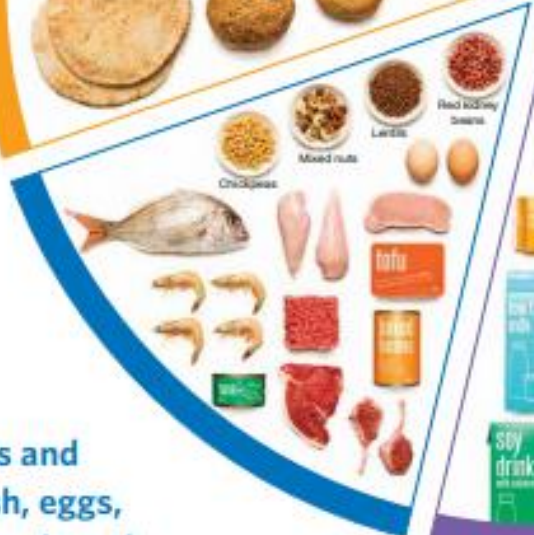
Grain (cereal) foods,
mostly wholegrain
and/or high cereal
fibre varieties



Vegetables and
legumes/beans



Lean meats and
poultry, fish, eggs,
tofu, nuts and seeds
and legumes/beans



Fruit



Milk, yoghurt, cheese
and/or alternatives,
mostly reduced fat

