

Science and Technology sample unit: Paddock to plate

Early Stage 1/Stage 1 (K–1 composite class)

Duration: 10 weeks (1.5 hours per week)

Unit context

Living things need food to stay alive and healthy. What do we know about where our food comes from and how it gets to us from farms and factories?

Target outcomes

Early Stage 1 A student:

- STe-3VA** develops informed attitudes about the current and future use and influence of science and technology based on reason
- STe-4WS** explores their immediate surroundings by questioning, observing using their senses and communicating to share their observations and ideas
- STe-5WT** uses a simple design process to produce solutions with identified purposes
- STe-8NE** identifies the basic needs of living things
- STe-9ME** identifies that objects are made of materials that have observable properties
- STe-10ME** recognises how familiar products, places and spaces are made to suit their purpose

Stage 1 A student:

- ST1-3VA** develops informed attitudes about the current and future use and influence of science and technology based on reason
- ST1-4WS** investigates questions and predictions by collecting and recording data, sharing and reflecting on their experiences and comparing what they and others know
- ST1-5WT** uses a structured design process, everyday tools, materials, equipment and techniques to produce solutions that respond to identified needs and wants
- ST1-11LW** describes ways that different places in the environment provide for the needs of living things
- ST1-13MW** relates the properties of common materials to their use for particular purposes
- ST1-16P** describes a range of manufactured products in the local environment and how their different purposes influence their design

Unit overview

In this unit, students are introduced to and begin to practise the science skills of observing, questioning, predicting and communicating. Students observe a range of farm animals and farm produce, and explore ways farm produce is packaged before being moved from the farm to places where the food is sold or made into other products for sale. They represent their ideas in a model to illustrate the path of one everyday food, eg milk, to show the journey of one product from paddock to plate and explore some criteria for packaging a dairy product. Students participate in activities to view some past and present methods of processing some foods and carry out simple investigations about the properties of materials used to package food. In this unit, students will be in contact with foods.

Teachers should be aware that students may have food and other allergies that can result in serious medical consequences. This is an important consideration in selecting foods to be handled and potentially consumed.

Content	Teaching and learning activities
<p>Skills</p> <p>Working Scientifically</p> <p>ES1 Students communicate by:</p> <ul style="list-style-type: none"> using a range of methods to share observations and ideas, such as drawing, informal and guided discussion, role-play, contributing to joint construction of short texts and/or using digital technologies (AC SIS012)   <p>S1 Students communicate by:</p> <ul style="list-style-type: none"> representing and communicating observations and ideas using oral and written language, drawing and role-play (AC SIS029, AC SIS042)  <p>Knowledge and Understanding</p> <p>ES1 Made Environment</p> <p>Products, places and spaces in the immediate environment are made to suit their purpose.</p> <p>Students:</p> <ul style="list-style-type: none"> explore a range of existing products, places and spaces, and discuss their likes and dislikes  <p>S1 Products</p> <p>There is a range of manufactured products in the local environment.</p> <p>Students:</p> <ul style="list-style-type: none"> explore a variety of products in the local environment, eg food products and industrial products 	<p>Class activity – What are some foods that come to us from a farm?</p> <p>Teacher background</p> <p><i>The focus of this activity is for students to observe first-hand the growing and husbandry of plants and animals that provide our food, specifically to observe ways that farmers meet the needs of living things on a dairy farm. This may be through an excursion to a farm, the agriculture plot of a nearby high school, an agricultural show, a visit by a travelling kindy farm, or an appropriate video link.</i></p> <p>Students participate in an activity demonstrating aspects of a dairy farm that make it suitable for large numbers of cows.</p> <p>Following the activity, students observe and respond to teacher questions to identify important facts about dairy farms, the dairy farm routine and its link with the way milk is processed in a factory. The teacher models ways to represent sequencing of information gathered, such as a storyboard.</p> <p>Pair activity</p> <p>Students create a display of a collection of pictures of a particular food, eg dairy foods, from catalogues or magazines and predict where the foods come from. They could also discuss which dairy foods they like/dislike.</p> <p>Students name several items from the provided samples and/or from their own prior knowledge that they think are milk or milk-based and predict where the foods come from (farm or factory). The pictures are placed in appropriate groups or recorded using a simple table.</p> <p>Students use the information to individually record as a drawing or simple text to:</p> <ul style="list-style-type: none"> develop a simple chain of events from growing grass and leading to collection of milk from cows on a farm and its transport to a factory/shop collect their ideas on what farmers need to do to care for cattle.
<p>Knowledge and Understanding</p> <p>ES1 Natural Environment</p> <p>Living things have basic needs, including food and water. (ACSSU002)</p>	<p>What do living things need to stay alive?</p> <p>Teacher background</p> <p><i>This activity could be integrated with content from PDHPE.</i></p> <p>Students identify some familiar living things and record their suggestions, eg dogs, caterpillars, birds, fish, plants, farm animals and</p>

Content	Teaching and learning activities
<p>Students:</p> <ul style="list-style-type: none"> describe what plants and animals, including humans, need to stay alive and healthy, eg food, water and air <p>S1 Living World</p> <p>Living things live in different places where their needs are met. (ACSSU211)</p> <p>Students:</p> <ul style="list-style-type: none"> describe how some different places in a local land or aquatic environment provide for the needs of the animals or plants that live there ✨ 	<p>humans. In their allocated groups, the students talk about and share their ideas about what living things need to stay alive.</p> <p>With teacher guided questioning in a class discussion, students provide suggestions that air, water and food are needed by all living things (including humans) to stay alive.</p> <p>The teacher poses the question ‘Why do we need food?’. In a guided class discussion, the students suggest ways that humans use food, eg milk gives us strong teeth and bones, and fuel/energy to do things, grow and keep us healthy. The teacher uses a healthy food pyramid to identify some foods that are used for energy and growth.</p> <p>Additional activities</p> <ol style="list-style-type: none"> Class with teacher and parent helpers or Year 6 buddies make a class ‘fruit salad’ as an example of healthy food to choose. Students and teacher jointly construct a description of the process used. Students identify some fruits they like and collate class results to create a picture graph.
<p>Skills</p> <p>Working Scientifically</p> <p>ES1 Students question and predict by:</p> <ul style="list-style-type: none"> responding to questions about familiar objects and events they are curious about in the natural and made environments (AC SIS014) <p>Students process and analyse data and information by:</p> <ul style="list-style-type: none"> organising objects or images of objects to display data and/or information <p>S1 Students question and predict by:</p> <ul style="list-style-type: none"> responding to and posing questions (AC SIS024, AC SIS037) <p>Students conduct investigations by:</p> <ul style="list-style-type: none"> using a range of methods to gather data and/or information including using their senses to make observations safely and carefully, using simple tools and equipment 🧰 	<p>Observing and exploring some types of foods we eat</p> <p>Teacher background</p> <p><i>Learning in Science and Technology engages students in actively participating in hands-on activities to learn about the processes that people use when conducting science investigations and designing and producing. Students learn about making and recording observations and ideas, responding to and asking questions. In this activity they use their observation skills to identify similarities and differences and explore how they might sort and organise objects and images to record and display information.</i></p> <p>The teacher sets up a display of a variety of packaging from familiar foods that the students have brought to school. These would include breakfast food packaging wrappers, cereal and biscuit boxes, empty milk cartons, cans, plastic juice bottles. The display also contains images of a variety of fresh foods from advertising catalogues and some fresh foods, eg fruit, bread, eggs. Alternatively, students may participate in a planned visit to the school canteen. They could:</p> <ul style="list-style-type: none"> identify a range of healthy foods identify foods as ‘natural’(directly from the farm) or ‘made’(processed) examine the variety of packaging used to store foods consider how the food arrived at the canteen or at shops. <p>Through asking and modelling questioning, the teacher engages the students in sharing what they know and are curious about the foods investigated. By grouping foods and communicating where foods come from, the teacher introduces and models the way an organiser (eg a visual collage/mind map) could be used as a class display and could be built through the unit.</p> <p>What do we eat for breakfast?</p> <p>The students observe the displayed collection of familiar foods, and the teacher responds to, asks and models questions that engage the students in identifying which of the foods would be eaten for breakfast.</p> <p>Using the students’ responses, the teacher models how objects can be grouped by:</p> <ul style="list-style-type: none"> re-organising the displayed foods/packages/images guiding students to place the breakfast food objects or images inside a large hoop to separate them from others. <p>With teacher guidance, the students use a camera to create their individual record of the breakfast foods they have identified. They add the images to the class visual collage/mind map.</p>

Content	Teaching and learning activities
<p>Skills</p> <p>Working Scientifically</p> <p>ES1 Students process and analyse data and information by:</p> <ul style="list-style-type: none"> engaging in discussions about observations and using drawings to represent ideas (ACSIS233) ✨ <p>S1 Students process and analyse data and information by:</p> <ul style="list-style-type: none"> using a range of methods to sort information, including drawings and provided tables, to match objects and events based on easily observable characteristics (ACSIS027, ACSIS040) 📄 <p>Knowledge and Understanding</p> <p>ES1 Made Environment</p> <p>Products, places and spaces in the immediate environment are made to suit their purpose.</p> <p>Students:</p> <ul style="list-style-type: none"> identify a variety of materials that are used in a range of existing familiar products, places and spaces <p>S1 Material World</p> <p>The different properties of materials enable them to be used for particular purposes.</p> <p>Students:</p> <ul style="list-style-type: none"> identify the properties of some common materials and why they are used for particular purposes, eg the waterproof property of plastic rainwear or insulating property of a woollen jumper ✨ 	<p>Identifying natural and made products</p> <p>Teacher background</p> <p><i>Learning in Science and Technology involves students in using strategies to gather, process and communicate their observations, ideas and findings. Students develop their skills in sorting, organising and representing information collected during their investigations using drawings and in Stage 1, provided tables.</i></p> <p>The teacher introduces the idea of animals and plants as source of food and other materials people need/want and to develop an understanding about the difference between 'natural' materials and 'made' materials, eg using a website such as 'Australian Year of the Farmer'.</p> <p>Using objects in the classroom, students use stickers to identify a range of materials using groupings such as plant or animal, or if they come directly from a farm (natural) or from a factory (made). The students share their reasons for the way they have grouped the materials.</p> <p>Where does our favourite food come from?</p> <p>Using the displayed collection of foods, the teacher reviews the visit to the canteen and/or storyboard, and asks students to think about where these foods might come from.</p> <p>The teacher models the sorting and organising of images from a variety of teacher-provided resources to show some of the steps in how food gets from the farm to the shop. Examples could include fresh fruit, vegetables, eggs simply packed, some grains milled to flour then packaged, milk packaged or processed into yoghurt/cheese. Through guided discussion and using a series of images, the teacher models, for one food, some steps in the chain of events that must occur to get the food to them from the farm/factory. The students record the example on a teacher-provided worksheet.</p> <p>Individually, students identify a favourite food, and they find and select images from some steps in the chain the food moves through to get to them from farm/factory. In small groups they share and revise their ideas with others before placing the images into the spaces on the teacher-provided worksheet.</p> <p>Reflection: Students compare their worksheets and discuss the questions: Where does the shop/supermarket get foods from? How does the food get to you from the farm/factory? Students discuss what might happen if food cannot get from the farm to the shop/supermarket. The students explore some scenarios such as what happens if plants do not get enough water to grow, there are not enough farms to grow/produce the food we need, or trucks cannot pick up the milk/vegetables.</p>

Content	Teaching and learning activities
<p>Skills</p> <p>Working Scientifically</p> <p>ES1 Students plan and conduct investigations by:</p> <ul style="list-style-type: none"> exploring and making observations by using their senses to gather information about objects and events in their immediate surroundings (ACSIS011, ACSHE013) ⚙️ <p>S1 Students conduct investigations by:</p> <ul style="list-style-type: none"> working cooperatively and individually when participating in different types of guided investigations to explore and answer questions, such as manipulating materials, testing ideas, and accessing information sources, surveys, and fieldwork (ACSSU025, ACSIS038) 👥 <p>Knowledge and Understanding</p> <p>ES1 Made Environment</p> <p>Objects are made of materials that have observable properties. (ACSSU003)</p> <p>Students:</p> <ul style="list-style-type: none"> group a range of materials on the basis of observable properties, eg flexibility, texture, strength and colour <p>S1 Material World</p> <p>The different properties of materials enable them to be used for particular purposes.</p> <p>Students:</p> <ul style="list-style-type: none"> use their senses to identify the similarities and differences in the properties of materials, eg the textures of different 	<p>Conducting investigations – Observing the properties of familiar products</p> <p>Teacher background</p> <p><i>Conducting scientific investigations requires students to follow planned procedures that include keeping some aspects the same and making observations using their senses to gather information. In this activity, time should be allowed for the yoghurt and cottage cheese to be produced and made in advance for students to observe the product. Students are guided towards identifying similarities and differences between objects.</i></p> <p>The teacher introduces the activity by posing the question: How are some dairy products made from milk?</p> <p>The class reviews the collected pictures of dairy foods to identify some examples of dairy products made from milk.</p> <p>Students observe teacher demonstration of:</p> <ul style="list-style-type: none"> making yoghurt, eg stirring some natural yoghurt into some warmed milk and allowing this mixture to stand in a thermos overnight cottage cheese, eg making junket with warmed milk and junket tablets, stirring the set junket, then draining through cheesecloth. <p>The students examine one batch of each of the above prepared earlier.</p> <p>Students observe and describe the observable properties of milk, yoghurt and cottage cheese (eg colour, texture, ability to flow) and compare what is similar and what is different.</p> <p>The students follow the teacher-described steps that make butter and/or ice cream, identifying the information to be collected by the students, and emphasising safe practices including allergy awareness.</p> <p>In pairs or small groups with their Year 6 buddies, students undertake first-hand activities to make:</p> <ul style="list-style-type: none"> butter, eg by shaking pure cream with marbles in a sealed plastic container ice cream, eg by shaking flavoured milk sealed in a small zip-lock bag inside a larger zip-lock bag containing crushed ice and salt. <p>Students observe the properties of the starting materials and finished product. They share their findings with another group, and describe to each what they did to make the observed changes.</p> <p>Teacher poses the question: How did students know when butter and/or ice cream was produced? How would butter/cheese be produced in a factory? Have people always made these products in this way?</p> <p>Students observe how butter/ice cream was made in the past by watching a video or listening to a visiting guest speaker on old-fashioned butter churns, or examining a sample of one. (This could be related to a previous museum visit.)</p> <p>The students review and annotate the class visual collage/mind map to include their findings and ideas from the investigation.</p>

Content	Teaching and learning activities
<p>fabrics, the difference in hardness of solid materials and the runniness of different liquids</p>	
<p>Skills</p> <p>Working Scientifically</p> <p>ES1 Students plan and conduct investigations by:</p> <ul style="list-style-type: none"> • sharing what they already know and how they could find out more about their questions relating to the natural and made environments <p>S1 Students plan investigations by:</p> <ul style="list-style-type: none"> • identifying the purpose of the investigation <p>Skills</p> <p>Working Technologically</p> <p>ES1 Students explore and define a task by:</p> <ul style="list-style-type: none"> • discussing the purpose and main features of what they need to produce and suggesting the materials they could use <p>S1 Students explore and define a task by:</p> <ul style="list-style-type: none"> • identifying needs and wants of users/audiences, eg using interviews, observations and surveys 🗳️ 👤 <p>ES1 Students develop ideas and produce solutions by:</p> <ul style="list-style-type: none"> • safely using common classroom equipment, resources and techniques to shape and join familiar materials <p>S1 Students generate and develop ideas by:</p> <ul style="list-style-type: none"> • exploring different materials by observing and manipulating them and using trial-and-error <p>ES1 Students evaluate by:</p> <ul style="list-style-type: none"> • reflecting on what they did and the 	<p>Conducting investigations</p> <p>Teacher background</p> <p><i>To select materials most appropriate for a particular purpose, students need to have some knowledge of the properties of those materials. Students identify some features of containers that hold liquids, then investigate the containers they have collected to see which ones have these properties. In this activity, time should be allowed for cheese slices to be placed in the refrigerator for a week.</i></p> <p>Testing the suitability of packaging materials for dairy products</p> <p>Through teacher questioning, students review their observations of materials used in the packaging of everyday foods, eg breakfast foods and foods sold in the school canteen.</p> <p>The teacher and students plan an investigation. The students observe the collected packaging and make predictions about suitable packaging for dairy products.</p> <p>In small groups, students follow a guided plan to test how well different types of packaging hold wet or dry materials.</p> <p>Students carry out a 'wet' test to identify the materials that would be best for some dairy products by:</p> <ul style="list-style-type: none"> • pouring the same volume of water into similar sized containers/packaging • observing if the water is contained securely, or measuring how long it takes for the water to drip through. <p>Students carry out a 'dry' test to identify the materials that would be best for some dairy products by:</p> <ul style="list-style-type: none"> • placing unwrapped processed cheese slices in different packaging in the fridge for a week • comparing the cheese slice from each package with a fresh piece of cheese at the end of the week. <p>With teacher guided questioning, the students suggest which types of packaging would be best for different dairy products.</p>

Content	Teaching and learning activities
<p>usefulness of the final solution.</p> <p>S1 Students evaluate by:</p> <ul style="list-style-type: none"> identifying how their solution meets the needs and wants of users/audiences  <p>Knowledge and Understanding</p> <p>ES1 Made Environment</p> <p>Objects are made of materials that have observable properties. (ACSSU003)</p> <p>Students:</p> <ul style="list-style-type: none"> observe, using their senses, a range of materials used to make specific objects, products, places and spaces <p>Products, places and spaces in the immediate environment are made to suit their purpose.</p> <p>Students:</p> <ul style="list-style-type: none"> communicate their ideas about how familiar products, places and paces work and have features that help them to be useful, eg shoulder straps, zippers and compartments in a school bag  <p>S1 Products</p> <p>The different purposes of products influence their design.</p> <p>Students:</p> <ul style="list-style-type: none"> identify the purpose of some familiar products and explore the features of their designs that make the products work, eg the broad brim on a sun hat or a plastic raincoat 	
<p>Skills</p> <p>Working Scientifically</p> <p>ES1 Students plan and conduct investigations by:</p> <ul style="list-style-type: none"> manipulating objects and materials through purposeful play 	<p>Communicating ideas</p> <p>Teacher background</p> <p><i>Information collected during science investigations and design projects can be represented and communicated in a number of ways. Students consider the needs of an audience before deciding how to present their findings.</i></p>

Content	Teaching and learning activities
<p>S1 Students communicate by:</p> <ul style="list-style-type: none"> displaying data and information in a variety of ways, including drawings, simple texts, provided tables and graphs, using digital technologies as appropriate   <p>Skills</p> <p>Working Technologically</p> <p>ES1 Students develop ideas and produce solutions by:</p> <ul style="list-style-type: none"> following a series of steps to draw or model ideas or construct solutions <p>S1 Students explore and define a task by:</p> <ul style="list-style-type: none"> identifying needs and wants of users/audiences, eg using interviews, observations and surveys <p>Students generate and develop ideas by:</p> <ul style="list-style-type: none"> using techniques for documenting and communicating design ideas, including simple plans, drawings and models, using familiar materials  <p>Students produce solutions by:</p> <ul style="list-style-type: none"> using a range of everyday tools, equipment, materials and techniques 	<p>Preparing a class display</p> <p>With teacher-guided questioning, students share their knowledge about foods from farms and factories.</p> <p>Students observe information products such as a poster or other multimedia display in their learning space and/or other places in the school. They identify the ways information has been presented, eg size of letters, amount of text, use of pictures</p> <p>Students use these features to design a class display of the journey of favourite food products from the farm to shop/home/school. In groups of 3–4, students select and produce a different section of the display, using pictures, models, and/or own text, then assemble the display.</p> <p>As a class activity, students use a peer evaluation strategy to provide feedback on how well each group included the identified characteristics of an effective display.</p>
	<p>Evaluation and reflection</p> <p>Students reflect on their learning by:</p> <ul style="list-style-type: none"> participating in a discussion about the information recorded in the class display, and identifying new learning arising from the ideas they were curious about comparing the similarities and differences in the class presentations peer assessment of the class presentations, identifying what they liked about them and why individually reflecting on their learning by identifying one thing they already knew, one thing they learned and one question they would like to ask identifying what they learned from working with others in a group.

Resources	Assessment overview
<ul style="list-style-type: none"> • Collection of samples of breakfast/dairy foods • Ingredients for ice cream, yoghurt, cottage cheese and butter • Food packaging – individual sizes where possible • Images of different types of food • Supermarket catalogues • Dictionary of Classroom Strategies K–6 (BOS) • English books, eg <i>Don't Forget the Bacon</i> by Pat Hutchins, <i>The Very Hungry Caterpillar</i> by Eric Carle, <i>For All Creatures</i> by Glenda Millard <p>Websites</p> <ul style="list-style-type: none"> • www.landlearn.nsw.org.au/production-chains/video-case.../milk • www.primezone.edu.au/school-resources/f-2-home.html • www.activityvillage.co.uk/farm-animals-printables.htm • www.dairy.edu.au/discoverdairy • http://splash.abc.net.au/early-primary/science 	<p>Using knowledge and understanding developed in the previous lessons, students produce a flowchart from a series of picture outlines they colour or decorate, before placing them in the correct order on a proforma.</p> <p>ES1 or students working at ES1 level: Assemble an information product of pictures with text to show the production of a food product such as milk and milk products from farm to shop.</p> <p>Stage 1 (Year 1) or students working at S1 level: Assemble an information product of pictures and write their own text to show the production of a food product such as milk and milk products from farm to shop.</p>

Links to other KLA outcomes	
Students will access the ES1 or S1 outcomes appropriate to their stage of learning	
Early Stage 1	Stage 1
<p>English</p> <p>ENe-1A A student:</p> <ul style="list-style-type: none"> communicates with peers and known adults in informal and guided activities demonstrating emerging skills of group interaction <p>ENe-2A A student:</p> <ul style="list-style-type: none"> composes simple texts to convey an idea or message <p>ENe-8B A student:</p> <ul style="list-style-type: none"> demonstrates emerging skills and knowledge of texts to read and view, and shows developing awareness of purpose, audience and subject matter 	<p>English</p> <p>EN1-1A A student:</p> <ul style="list-style-type: none"> communicates with a range of people in informal and guided activities demonstrating interaction skills and considers how own communication is adjusted in different situations <p>EN1-2A A student:</p> <ul style="list-style-type: none"> plans, composes and reviews a small range of simple texts for a variety of purposes on familiar topics for known readers and viewers <p>EN1-8B A student:</p> <ul style="list-style-type: none"> recognises that there are different kinds of texts when reading and viewing and shows an awareness of purpose, audience and subject matter
<p>Mathematics</p> <p>MAe-11MG A student:</p> <ul style="list-style-type: none"> describes and compares the capacities of containers and the volumes of objects or substances using everyday language 	<p>Mathematics</p> <p>MA1-11MG A student:</p> <ul style="list-style-type: none"> measures, records, compares and estimates volumes and capacities using uniform informal units
<p>PDHPE</p> <p>PHES1.12 A student:</p> <ul style="list-style-type: none"> displays basic positive health practices 	<p>PDHPE</p> <p>PHS1.12 A student:</p> <ul style="list-style-type: none"> recognises that positive health choices can promote wellbeing
<p>History</p> <p>HTe-1 A student:</p> <ul style="list-style-type: none"> communicates stories of their own family heritage and the heritage of others 	<p>History</p> <p>HT1-1 A student:</p> <ul style="list-style-type: none"> communicates an understanding of change and continuity in family life using appropriate historical terms <p>HT1-3 A student:</p> <ul style="list-style-type: none"> describes the effects of changing technology on people's lives over time