Acknowledgements

The ‘Farm to Fork’ game and learning materials were developed collaboratively with school students and teachers by ECU staff from across the Schools of Medical and Health Sciences (SMHS), Science (SOS), Education (SOE), and Arts and Humanities (SAH).

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Participating schools and community organisations
Young people and staff from the following schools and community organisations contributed ideas and/or feedback on the game during the development and testing stages:

Anchors Joondalup Youth Centre, Ashdale Secondary College, Bayswater Soccer Club, Bindoon Catholic Agricultural College, Butler College, Cockburn Youth Centre, John Curtin Community College, Methodist Ladies College, Servite College

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Contact
Ms Margaret Miller, Senior Research Project Manager, at m.miller@ecu.edu.au.
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Frequently Asked Questions

How can I download the ‘Farm to Fork’ game?

Farm to Fork ECU by Edith Cowan University is available to download from the Apple AppStore. 

Which devices are suitable to play the ‘Farm to Fork’ game?

Farm to Fork ECU is available to use on an Apple iPad.

Which student cohorts is the ‘Farm to Fork’ game best suited to?

Farm to Fork ECU has been designed for and tested with students in Years 7, 8 and 9. It may also be suitable in some Year 6 classrooms.

Which learning areas is the ‘Farm to Fork’ game best suited to?

Farm to Fork ECU is aligned to the WA and Australian Curriculum in Science, Design and Technologies, Humanities and Social Sciences and Health and Physical Education.

The game and learning activities address the sustainability cross curriculum priority and five of the seven general capabilities which extend across all learning areas.
Background

Food Systems Education

The food system is a complex web of activities involving the primary production of foods, their processing, distribution, access, consumption and waste management.

Food systems education intends to create an increased awareness of the entire farm to fork process. It includes how our food is grown/produced, the resources used to grow, process and distribute it, the processing involved and its impact on nutrition, safety, shelf-life and marketing, the distribution to market entities, where to access our food and how it is consumed. The learning is extended to understanding the people involved in every step of the food system and the management of resources and waste throughout the process from farm to fork.

A sustainable food system is a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised\(^1\).

This means that:
- It is profitable throughout (economic sustainability);
- It has broad-based benefits for society (social sustainability); and
- It has a positive or neutral impact on the natural environment (environmental sustainability).

Transformational Games

Transformational games are digital games used as a teaching tool to engage students in the classroom. They are designed to deliver specific learning goals, outcomes and experiences in a virtual world but related to real world situations.

‘Farm to Fork’ Game

‘Farm to Fork’ is a transformational game designed for students in the school years 6 to 9.

The ‘Farm to Fork’ game creates a virtual world in which the player manages the potato supply chain, starting with on-farm production, through processing to create different products, marketing and advertising to increase distribution and sales, and methods of preparing potatoes for consumption. Throughout these four game levels, the player is provided with key information and is challenged to make decisions which will affect the health of consumers, amount of waste generated and profitability of the potato industry. These decisions are registered by inbuilt Waste, Health and Wealth ($) meters, so players can see the consequences of their decisions and quiz answers. At the end, the player receives a score and feedback on how to receive a better score for each of these indicators.

Using ‘Farm to Fork’ Game in the Classroom

This interactive digital learning resource comprising the ‘Farm to Fork’ game app and associated learning activities has been specifically designed for Australian teachers/home schoolers for exploring food systems and developing food and nutrition literacy of early adolescent students.

Targeted at upper primary/lower secondary students, the ‘Farm to Fork’ game is available as an engaging and immersive digital app that compliments a range of WA and Australian Curriculum learning areas, including Science, Health and Physical Education, Design and Technologies and Humanities and Social Sciences.

By playing ‘Farm to Fork’, the student manages the potato food system from farm to fork, thus increasing students’ awareness of the food system and sustainable food production, distribution and marketing. Information provided in the game and challenge quizzes are designed to increase nutrition knowledge and ultimately to encourage students to make healthier and more sustainable food choices.

The associated learning activities, available in this Guide, have been developed to specifically target content from WA and Australian Curriculum learning areas - many of the activities are linked to multiple learning areas. The activities can be taught within a single learning area or as a cross curricular enquiry-based project. They have been designed to address a range of health, technology, economic and science concepts, skills and processes.

Accessing ‘Farm to Fork’ Game

Farm to Fork ECU by Edith Cowan University is available to download from the AppStore for use on an iPad. [https://apps.apple.com/au/app/farm-to-fork-ecu/id1513353482](https://apps.apple.com/au/app/farm-to-fork-ecu/id1513353482)

Students will enjoy playing the game individually on an iPad. Alternatively, teachers can project the game to a screen and facilitate playing the game with a group or the class.

A Power-point presentation for explaining to a class how to play the game is also available online.

Game Goals

Main Game Goal:

The main goal of the game player is to manage the potato food system. This requires attention to the following sub-game goals.

Sub Game Goals:

1. Ensure adequate supply of potatoes
2. Create demand for healthy potato products
3. Keep the business profitable - produce and sell potato products based on demand
4. Manage waste and environmental sustainability
Educational Goals

There are four levels within the ‘Farm to Fork’ game and each level addresses educational goals as outlined below:

<table>
<thead>
<tr>
<th>Educational goals per game level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. PRODUCTION</strong></td>
</tr>
<tr>
<td>✓ Knowledge of natural resource requirements for plants to grow e.g. soils, water, sunlight, air</td>
</tr>
<tr>
<td>✓ Understanding of agricultural practices, equipment, technology, financial and market pressures</td>
</tr>
<tr>
<td>✓ Understanding of economic and environmental sustainability of food production</td>
</tr>
<tr>
<td><strong>2. PROCESSING AND DISTRIBUTION</strong></td>
</tr>
<tr>
<td>✓ Knowledge of potential food end products</td>
</tr>
<tr>
<td>✓ Understanding of processing and distribution practices, technology, financial and market pressures</td>
</tr>
<tr>
<td>✓ Understanding of the health, economic, and environmental issues related to food processing and distribution</td>
</tr>
<tr>
<td><strong>3. WASTE MANAGEMENT</strong></td>
</tr>
<tr>
<td>✓ Knowledge of waste management and environmental sustainability</td>
</tr>
<tr>
<td>✓ Understanding what processes in the food system produce waste and how to reduce waste throughout the system</td>
</tr>
<tr>
<td>✓ Understanding of how to sustainably dispose of waste</td>
</tr>
<tr>
<td><strong>4. MARKETING, ACCESS AND CONSUMPTION</strong></td>
</tr>
<tr>
<td>✓ Knowledge of potential food distribution and access points for food products</td>
</tr>
<tr>
<td>✓ Understanding of supply and demand principles and the impacts of marketing on consumption</td>
</tr>
<tr>
<td>✓ Understanding of the health, economic, societal and environmental issues related to food marketing, access and consumption</td>
</tr>
<tr>
<td><strong>OVERALL GAME</strong></td>
</tr>
<tr>
<td>✓ Awareness of job roles in each stage of food production.</td>
</tr>
</tbody>
</table>
Curriculum Links

‘Farm to Fork’ educational goals can be linked per level to learning outcomes for various learning areas of the WA and Australian Curriculum. Table 1 shows the potential links for Years 6 - 9 for the following learning areas:

- Science
- Technologies
- Health and Physical Education
- Humanities and Social Sciences

More details of links with specific learning area strands are available in Table 2.

Much of the deeper educational content associated with these links is included in the learning tasks included in the teaching and learning resources designed to accompany the game (follow links in Table 3).

Table 1: Learning Area Connections to ‘Farm to Fork’ Game Level Educational Goals and Year Level

<table>
<thead>
<tr>
<th>Educational Goals per Game Level</th>
<th>Science</th>
<th>Technologies</th>
<th>Health and Physical Education</th>
<th>Humanities and Social Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PRODUCTION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Knowledge of natural resource requirements for plants to grow eg soils, water, sunlight, air</td>
<td></td>
<td></td>
<td>Year 6</td>
<td></td>
</tr>
<tr>
<td>✓ Understanding of agricultural practices, equipment, technology, financial and market pressures</td>
<td></td>
<td></td>
<td>Year 7</td>
<td>Year 7</td>
</tr>
<tr>
<td>✓ Understanding of economic and environmental sustainability of food production</td>
<td></td>
<td></td>
<td>Year 8</td>
<td>Year 9</td>
</tr>
<tr>
<td>2. PROCESSING AND DISTRIBUTION</td>
<td></td>
<td></td>
<td>Year 6</td>
<td></td>
</tr>
<tr>
<td>✓ Knowledge of potential food end products</td>
<td></td>
<td></td>
<td>Year 7</td>
<td>Year 7</td>
</tr>
<tr>
<td>✓ Understanding of processing and distribution practices, technology, financial and market pressures</td>
<td></td>
<td></td>
<td>Year 8</td>
<td>Year 8</td>
</tr>
<tr>
<td>✓ Understanding of the health, economic, and environmental issues related to food processing and distribution</td>
<td></td>
<td></td>
<td>Year 9</td>
<td>Year 9</td>
</tr>
<tr>
<td>3. WASTE MANAGEMENT</td>
<td></td>
<td></td>
<td>Year 6</td>
<td></td>
</tr>
<tr>
<td>✓ Knowledge of waste management and environmental sustainability</td>
<td></td>
<td></td>
<td>Year 7</td>
<td>Year 7</td>
</tr>
<tr>
<td>✓ Understanding what processes in the food system produce waste and how to reduce waste throughout the system</td>
<td></td>
<td></td>
<td>Year 8</td>
<td>Year 8</td>
</tr>
<tr>
<td>✓ Understanding of how to sustainably dispose of waste</td>
<td></td>
<td></td>
<td>Year 9</td>
<td></td>
</tr>
<tr>
<td>4. MARKETING, ACCESS AND CONSUMPTION</td>
<td></td>
<td></td>
<td>Year 6</td>
<td>Year 6</td>
</tr>
<tr>
<td>✓ Knowledge of potential food distribution and access points for food products</td>
<td></td>
<td></td>
<td>Year 7</td>
<td>Year 7</td>
</tr>
<tr>
<td>✓ Understanding of supply and demand principles and the impacts of marketing on consumption</td>
<td></td>
<td></td>
<td>Year 8</td>
<td>Year 8</td>
</tr>
<tr>
<td>✓ Understanding of the health, economic, societal and environmental issues related to food marketing, access and consumption</td>
<td></td>
<td></td>
<td>Year 9</td>
<td>Year 9</td>
</tr>
</tbody>
</table>
Table 2: 8 Game Level Educational Goal Connections to Learning Area Strands

<table>
<thead>
<tr>
<th>Game Level Goals</th>
<th>Science</th>
<th>Technologies</th>
<th>Health and Physical Education</th>
<th>Humanities and Social Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. PRODUCTION</strong></td>
<td>Science Understanding</td>
<td>Design and Technologies Knowledge and Understanding</td>
<td>Knowledge and Understanding - Economics and Business Inquiry and Skills</td>
<td></td>
</tr>
<tr>
<td>✓ Knowledge of natural resource requirements for plants to grow eg soils, water, sunlight, air</td>
<td>Science as a Human Endeavour</td>
<td>Design and Technologies Processes and Production Skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Understanding of agricultural practices, equipment, technology, financial and market pressures</td>
<td>Science Inquiry Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Understanding of economic and environmental sustainability of food production</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2. PROCESSING AND DISTRIBUTION</strong></td>
<td>Science as a Human Endeavour</td>
<td>Design and Technologies Knowledge and Understanding</td>
<td>Personal, Social and Community Health</td>
<td>Knowledge and Understanding - Economics and Business Inquiry and Skills</td>
</tr>
<tr>
<td>✓ Knowledge of potential food end products</td>
<td>Science Inquiry Skills</td>
<td>Design and Technologies Processes and Production Skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Understanding of processing and distribution practices, technology, financial and market pressures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Understanding of the health, economic, and environmental issues related to food processing and distribution</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3. WASTE MANAGEMENT</strong></td>
<td>Science as a Human Endeavour</td>
<td>Design and Technologies Knowledge and Understanding</td>
<td>Knowledge and Understanding - Economics and Business Inquiry and Skills</td>
<td></td>
</tr>
<tr>
<td>✓ Knowledge of waste management and environmental sustainability</td>
<td>Science Inquiry Skills</td>
<td>Design and Technologies Processes and Production Skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Understanding what processes in the food system produce waste and how to reduce waste throughout the system</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Understand how to sustainably dispose of waste</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4. MARKETING, ACCESS AND CONSUMPTION</strong></td>
<td>Science as a Human Endeavour</td>
<td>Design and Technologies Knowledge and Understanding</td>
<td>Personal, Social and Community Health</td>
<td>Economics and Business Inquiry and Skills</td>
</tr>
<tr>
<td>✓ Knowledge of potential food distribution and access points for food products</td>
<td>Science Inquiry Skills</td>
<td>Design and Technologies Processes and Production Skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Understanding of supply and demand principles and the impacts of marketing on consumption</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Understanding of the health, economic, societal and environmental issues related to food marketing, access and consumption</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cross Curriculum Priorities

The ‘Farm to Fork’ game and learning activities address the **sustainability** cross curriculum priority by encouraging students to think about current and future food production techniques and the ongoing capacity of Earth to maintain all life and meet the needs of the present without compromising the needs of future generations.

General Capabilities

The Australian Curriculum describes seven general capabilities which extend across each learning area. The ‘Farm to Fork’ game learning activities have been developed to assist teachers to address the following shaded capabilities.

<table>
<thead>
<tr>
<th>Litecy</th>
<th>Numeracy</th>
<th>ICT capability</th>
<th>Critical and creative thinking</th>
<th>Ethical understanding</th>
<th>Personal and social capability</th>
<th>Intercultural understanding</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Farm to Fork’ Game Learning Activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Teaching and Learning Activities

The ‘Farm to Fork’ teaching and learning activities are provided to address each of the four levels in the game as well as the overall food system. These are suitable for a range of WA and Australian Curriculum learning areas including Science, Design and Technologies, Health and Physical Education and Humanities and Social Sciences.

Some of the activities are linked to multiple learning areas, either in a major or minor way. The activities can therefore be taught within a single learning area or as a cross curricular enquiry-based project.

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This section provides teaching and learning activities related to the overall food system Food System and the four levels of the ‘Farm to Fork’ game: 1. Production, 2. Processing and Distribution, 3. Waste Management 4. Marketing, Access and Consumption.

These teaching and learning activities are suitable for a range of WA and Australian Curriculum learning areas including Science, Design and Technologies, Health and Physical Education and Humanities and Social Sciences.

Some of the activities are linked to multiple learning areas, either in a major (large tick) or minor way (small tick) (Table 3). The activities can be taught within a single learning area or as a cross curricular enquiry-based project.

Click on the teaching and learning activity title in Table 3 for direct access to the activity documents.

**Table 3: Learning Area Connections to Farm to Fork Teaching and Learning Activities and Game Levels**

<table>
<thead>
<tr>
<th>Game level</th>
<th>Teaching and learning activity</th>
<th>Science</th>
<th>Design and Technologies</th>
<th>Health and Physical Education</th>
<th>Humanities and Social Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Production</td>
<td>Healthy Soils</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>2. Processing and distribution</td>
<td>Food Processing, Nutrition and Health</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>3. Waste management</td>
<td>Food Waste</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>4. Marketing, access, consumption</td>
<td>Off to Market</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>How Food Advertising Works</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Hot Potato Makeover</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>5. Overall food system</td>
<td>What is a Food System?</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>What Job is That?</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Learning Task Intention:
At the end of this activity students should be able to
- Represent the journey of a food item through the food system.
- Understand the relationships between food, technology, health and the environment in the food system.

Background Information:
Our food system is complex, and each part of the system is critical to healthy food reaching us. After playing the game students will be able to identify the basic steps of the potato food system and begin to understand the factors that influence a healthy food supply.

Teaching Recommendation:
This learning task relates to all levels of the game and could be delivered across 2-3 lessons in a Design & Technologies – Food and fibre context.
It can be used as an introduction task for food production systems with the scope to extend the task to include an assessment for Food and fibre, by allowing students to research other food production systems and the key features of their design.

Equipment/Materials Required:
- Refresh.ED Food supply image cards – 1 set per 4 students
- iPad for individual or partner use
- Farm to Fork ECU by Edith Cowan University
- ‘Farm to Fork’ – Individual Review sheet
- Group Discussion Questions

Key Words:
Food supply chain, food system, food and fibre, food production, primary production, waste, consumption, distribution
Lesson Sequence Overview:

<table>
<thead>
<tr>
<th>STUDENT ACTIVITY</th>
<th>TEACHER FOCUS QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson 1</strong></td>
<td></td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>BEGIN THE CLASS WITH AN OPEN DISCUSSION. WRITE FOOD ON THE BOARD. ASK - WHAT IS FOOD? - WHERE DOES IT COME FROM? - HOW DOES IT GET TO OUR PLATE?</td>
</tr>
<tr>
<td>IDENTIFYING PRIOR KNOWLEDGE</td>
<td></td>
</tr>
<tr>
<td>CLASS DISCUSSION TO INTRODUCE THE TOPIC OF FOOD AND WHERE IT COMES FROM.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACTIVITY 1</th>
<th>EXPLAIN THAT STUDENTS ARE GOING TO LOOK AT THE FOOD SYSTEM (THE PROCESSES FOOD GOES THROUGH FROM FARM TO FORK). HAND OUT REFRESH.ED IMAGE CARDS – 1 SET/4 STUDENTS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>STUDENTS ARE TO WORK IN GROUPS OF 4. THEY SHOULD REVIEW THE IMAGE CARDS AND DISCUSS WHAT EACH IMAGE SYMBOLISES WITHIN A FOOD SYSTEM.</td>
<td></td>
</tr>
<tr>
<td>STUDENTS SHOULD THEN GROUP LIKE IMAGES INTO DIFFERENT CATEGORIES THEY BELIEVE ARE PART OF THE FOOD SYSTEM.</td>
<td></td>
</tr>
<tr>
<td>WHEN THE CATEGORIES ARE FINALISED STUDENTS WILL THEN TRY TO PLACE THEM IN A LOGICAL ORDER THAT MIGHT DEMONSTRATE THE FOOD SYSTEM FROM FARM TO FORK.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACTIVITY 2</th>
<th>FACILITATE AND ASSIST STUDENTS AS NEEDED. FACILITATE CLASS DISCUSSION TO REVIEW THE GAME ONCE ALL STUDENTS HAVE PLAYED IT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>STUDENTS PLAY ‘FARM TO FORK’ INDIVIDUALLY. (APPROX. 15MIN)</td>
<td></td>
</tr>
</tbody>
</table>

*What is a Food System?* teaching and learning activity
<table>
<thead>
<tr>
<th>STUDENT ACTIVITY</th>
<th>TEACHER FOCUS QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson 2</strong></td>
<td></td>
</tr>
<tr>
<td><strong>ACTIVITY 3</strong></td>
<td></td>
</tr>
<tr>
<td>Replay ‘Farm to Fork’ game if required. Individually complete the ‘Farm to Fork’ review worksheet.</td>
<td>Review last lesson and highlight the key points outlined in the ‘Farm to Fork’ game. Hand out ‘Farm to Fork’ review worksheet.</td>
</tr>
<tr>
<td><strong>ACTIVITY 4</strong></td>
<td></td>
</tr>
<tr>
<td>In small groups, discuss and review one of the reflection questions. Prepare to report back your findings to the class.</td>
<td>Divide the class into 5 groups, hand out 1 discussion question to each group, and allow students to discuss the question. Some research may be required if internet access is available. Monitor small group discussions. Facilitate class discussion for each group to report back to the rest of the class and summarise their discussion question.</td>
</tr>
</tbody>
</table>

**Links to Other Resources**

Food Supply Chain – Activity Cards

Food System Model

How to Teach the Food System – Teacher Information Sheet

Food Systems Additional Resources – Teacher Information Sheet

*What is a Food System?* teaching and learning activity
Teacher Information
Activity 1

Useful information and resources to deliver this activity

1. You will need to print and prepare the Food supply chain parts image cards for each group.

*Refresh.ED food supply chain cards:*

This is a basic example of a food supply chain.

![Food System Diagram]

2. Use this guide to teach the food supply system to students.

*How to Teach the Food System – Teacher Information Sheet*

3. Use this as an example of a food system diagram to show the class at the end of the lesson and in future lessons.

*Refresh.ED Food System – Teacher Resource*

*What is a Food System?* teaching and learning activity
‘Farm to Fork’ Review
Student Work Sheet

1. After playing the ‘Farm to Fork’ game.
   Identify the 4 stages of the ‘Farm to Fork’ game and describe what happens in each stage.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>3</td>
<td>4</td>
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</tbody>
</table>

2. Using the Refresh.ED Food System model as a guide, what other processes/steps would be involved in the potato food system which are not identified in the game?

________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
3. Using the knowledge you have learnt about food systems and the production of potatoes, draw a diagram that best represents the potato food system.

Potato Food System Diagram
Group Discussion Questions  
Activity 4

A. How do the potato producers need to respond to the demands of the customers once the Healthy Eating Advertising campaigns are implemented?

B. Which potato product/s resulted in the least amount of waste and why do you think this has happened? What could be done to further reduce waste when producing potato products?

C. When supply of potatoes is reduced or slower due to production conditions or supply problems (e.g. Bad weather results in a crop failing), what impact does that have on the marketplace?

D. What factors need to be considered for a product to be sustainable? What potato product/s from the game are the most sustainable to produce and why?

E. How do you think technology has changed the production of potatoes and potato products over the past 100 years? What impact has this had on our environment?
Learning Task Intention:

At the end of this activity students should be able to:

- Describe the importance of soil in agriculture of food crops.
- Identify properties needed for a healthy soil and link quality soil types for food production.
- Explore soil types through task investigation.
- Produce a written science report on soil analysis experiment.

Background Information:

Soil plays a vital role in primary production of food, carbon and water cycles and biodiversity. Nutrient deficient, poor irrigation and weeds can decrease the yield size and increase the waste. Through playing the game, students experiment with various healthy soil properties and solutions to improve soil quality, necessary for producing quality food crops. Improving the soil quality will work toward a more sustainable future as the soil is maintained and looked after for future harvests.

Potatoes prefer cool-warm temperatures with daytime temperatures of 15-20°C, they will not grow well in extreme heat. Potatoes are moderately sensitive to soil salinity and alkalinity. Potatoes grow in soils that are loamy and sandy loam soils that are rich in organic matter, with good drainage and aeration but not dry.

Teaching Recommendation:

This learning task focuses on the Production level of the game and can be completed across 3 lessons in a Science context. Students play ‘Farm to Fork’ game – approximately 15min. After playing ‘Farm to Fork’ students will watch video by NCRS on soil health and discuss. Students will then conduct their own soil analysis experiment, identifying the properties of healthy soil. Basic science investigation skills to be developed through a written scientific report. Students to be guided through class discussion, following group presentation of findings from experiment.

Equipment/Materials Required:

- iPad for individual or partner use
- Farm to Fork ECU by Edith Cowan University
- Internet access for student research
- Soil samples
- Experiment materials as listed in below experiments (3)

Key Words:

Soil, soil qualities, agriculture, food crop, investigation skills
## Lesson Sequence Overview

### Lesson 1

**INTRODUCTION**

### ACTIVITY 1

Play ‘Farm to Fork’ game.

### ACTIVITY 2

Watch video by NCRS: Soil Health

https://www.youtube.com/watch?v=_qM2fv6v3-I

In small groups students to identify and discuss:

- Healthy soil and building practices to develop soil quality
- Soil types for food production
- Food waste for future crop harvests

From YouTube clip by NCRS:

- Can you identify at least four (4) healthy soil building practices?
- What are some benefits of rotating crops for the environment?
- How can cover-crops be important to increase productivity of future harvests?
- How can food waste and decaying matter be used to grow crops?

### Lesson 2

**INTRODUCTION**

Explain that today students are going to do some soils analysis experiments.

### ACTIVITY 1

Soil Analysis group experiments, as per

http://www.fao.org/3/a-i7957e.pdf

1. Water Retention in Soil (pg.9)
2. Air in the Soils (pg. 11)

In small groups, students to discuss design and observations they will make.

Conduct group experiments 1 – 3.

### ACTIVITY 2

Write a scientific report on soil analysis experiment. Complete the following headings:

- Aim
- Materials
- Risk Assessment
- Method

Divide students into 3 groups and allocate one of the three FAO experiments to each group.

Facilitate class experiments.

Guide students to complete the following headings of their scientific report:

- Aim
- Materials
- Risk Assessment
- Method
### Recommended Extension Activities

**GROWING POTATOES**
In this experiment students will plant potato seeds and observe how they grow under varying conditions

**Links to Other Resources:**
Examples of potential farming practices to improve crop yield and decrease waste
**Information on testometers** as an irrigation practice for optimal soil level to ensure water crop demand is met

Potato Cultivation – Soil, Climate, Water
Healthy Soils teaching and learning activity

Soil Analysis
Student Activity Sheet

1. In small groups students to download one of the experiments titled below from FAO
   http://www.fao.org/3/a-i7957e.pdf
      a. Water Retention in Soil (pg.9)
      b. Air in the Soils (pg. 11)
      c. Separating Soil & Estimating Soil Texture (pg. 13)

2. In small groups, students to discuss design and observations they will make.

3. Students conduct chosen group experiment 1-3.
Soil Analysis Written Report
Student Activity Sheet

In this task you will write a scientific report on your soil analysis.

What to do:
1. Collect all the data you have recorded during the experiment and follow the steps below to write your report.

2. Your report should be written under the following headings:
   - **Aim**: A single sentence stating clearly what the experiment is designed to investigate.
   - **Materials**: Make a list of the equipment that you used.
   - **Risk assessment**: Identify and assess any risks; give precautions taken.
   - **Method**: This is a record of the steps and procedures during the experiment. It is usually written in report style (third person, past tense) and should include a diagram of the experimental set-up.
   - **Results**: Record observations and measurements in a table where possible. You may also have some photographs or drawings. A graph of results should be included here.
   - **Discussion**:
     - Describe any trends that you observed. Refer to your graph and any other observations you recorded.
     - Explain your results.
     - Are your results similar to those of other class members? How can you be more certain of reliability?
     - Describe any problems in your experiment and suggest improvements.
   - **Conclusion**: Refer back to the aim of the experiment and summarise it in a sentence.

Healthy Soils teaching and learning activity
Learning Task Intention:

At the end of this activity students should be able to:

- Identify common food processing techniques
- Analyse the positive and negative impacts of different food processing techniques on the nutritional value of food products.
- Analyse the positive and negative impacts of different food processing techniques on the health of consumers.

Background Information:

We use technology every day to process our food. Food is altered or changed through both simple/primary (e.g. washing, chopping) and complex/secondary and tertiary (dehydrating) processing methods. Food processing has both positive and negative effects on the nutritional value of food products and the health or individuals who consume them.

It is recommended teachers use the additional Teacher Information pages for further information on food processing techniques and classifications of processing that link to health.

Students will need to have some prior knowledge on reading food labels to assist them to complete this task, or alternatively there are support documents provided to assist with teaching food labelling during this learning experience.

Teaching Recommendation:

This learning task focuses on two levels of the game; Processing and Distribution; and Marketing, Access and Consumption levels. It can be completed across 2-3 lessons in a Design and Technology-Food or a Health and PE context.

The ‘Farm to Fork’ game takes approximately 15 minutes to play and can be used to introduce students to the processes used to manufacture food products.

In the game, during the processing stage, players are responsible for turning the potato into products including fries, crisps, salad and table potatoes for selling at the market via food processing techniques. Here, washing, drying and cutting of all potatoes occurs. Fries and crisps are in addition, put through frying machine which create additional waste and alter their nutritional value.

The aim for the player is to increase sales of whole food options (salad and whole potatoes) and decrease sales of the more processed options (fries and crisps). It is recommended students play the game as an introduction to this topic and again after completing their learning tasks with the aim to improve their game results.

Equipment/Materials Required:

- iPad for individual or partner use
- Farm to Fork ECU by Edith Cowan University
- Internet access for student research

Key Words:

Food processing techniques, nutritional value, food labels, health, unprocessed, minimally processed, ultra-processed

Food Processing and Nutrition teaching and learning activity
Lesson Sequence Overview:

<table>
<thead>
<tr>
<th>STUDENT ACTIVITY</th>
<th>TEACHER FOCUS QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson 1</strong></td>
<td></td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Begin with a class discussion:</td>
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<tr>
<td></td>
<td>What is a processed food?</td>
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<tr>
<td></td>
<td>Do processed food products have the same nutritional value as unprocessed/raw foods?</td>
</tr>
<tr>
<td>Play the game and see what potato products can be produced and sold.</td>
<td>Explain that students are going to play ‘Farm to Fork’ and explore what potato products can be made.</td>
</tr>
<tr>
<td>Students complete question 2.</td>
<td>Hand out the Student Activity Sheet</td>
</tr>
<tr>
<td>Students to complete question 3 and 4.</td>
<td>Guide students through a discussion to think about how food is processed into different products.</td>
</tr>
<tr>
<td>Students complete question 5 by watching the videos.</td>
<td>Use the Teacher Information page to assist students to understand the different types of processing techniques and the 3 levels of processing (unprocessed, minimally processed and ultra-processed).</td>
</tr>
</tbody>
</table>

How to make potato chips - Factory Production
https://www.youtube.com/watch?v=REqhl-s97LE
BetaSpuds – Fresh Potato Processing
https://youtu.be/i65ffh9q9fU
How Its Made - 323 Frozen French Fries
https://www.youtube.com/watch?v=vjs1LLaxXrA&feature=youtu.be
How It’s Made Potato Salad
https://www.youtube.com/watch?v=GBzi1daU774
### Student Activity

**Lesson 2**

**Introduction**

Using online grocery shopping websites research one of the four (4) potato products per person. Record your finding on the worksheet.

**Take your completed information card and place it on the continuum indicating where you think your potato product fits on the line.**

Students independently complete the final questions 3-6 in section 2.

**Replay ‘Farm to Fork’**

### Teacher Focus Questions

Review the previous lesson. Divide the class into groups of 4 and distribute the Product Information worksheets.

Prepare 4 continuums on the board for students to see and later record their findings.

- Healthy food choice ➔ Unhealthy food choice
- Minimally processed ➔ Ultra-processed
- Minimal waste ➔ A lot of waste
- Cost $1/kg ➔ $10/kg

Encourage students to place their potato product on display indicating where it fits best on the continuum.

Discuss the class findings.

How healthy is the product?

(Encourage students to use the Understanding Food Labels document to compare the salt, fat, sugar and dietary fibre values to those that are recommended).

How processed is the product?

How much waste is produced during production?

What is the cost of the product?

Encourage students to replay with the aim to increase sales of whole food options (salad and table potatoes) and decrease sales of the more processed options (fries and crisps).

### Links to Other Resources:

Understanding food labels – Eat for Health

What is food processing?

Most food we consume undergoes a level of processing at some point from farm to fork. Food processing is the process of taking raw products and turning them into consumable foods. These processes are used to make food safer and more palatable for human consumption. Some foods can be consumed with very minimal processing however others are not able to be safely digested unless some level of processing occurs. For example, milk must be pasteurised, and potatoes and other starch products must be cooked to aid digestion.

Food processing can occur in the home when consumers wash, chop, peel, and cook food items. It also occurs at industry levels and takes place at various stages in the food supply chain, it could be the washing and packaging of raw food items, such as fruit and vegetables, in on-farm processing sheds. It also includes the industrialised processing of food items in factories where foods are prepared, modified and packaged.

Food processing grades

There are different grades of processing which can be described as -

<table>
<thead>
<tr>
<th>Primary Food Processing</th>
<th>Secondary Food Processing</th>
<th>Tertiary Food Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary food processing is the process of turning raw products into foods that can be consumed. In some cases, the food is ready to be consumed once primary processing is finished. An example is jerky made from smoked meat. In other cases, primary processing turns the product into an ingredient that can then be made into a consumable food, such as milling grain to create flour.</td>
<td>Secondary food processing is the process of using ingredients produced through primary food processing to create ready-to-eat foods. An example of this is using flour to make dough and then baking the dough to create bread. Other examples include fermenting grape juice with wine yeast to create wine and using ground meat to make sausages.</td>
<td>Tertiary food processing is the large-scale manufacture of ready-to-eat foods using multiple types of processing to reach their final, consumable forms. For example, tortilla chips. Corn is grown, then harvested and soaked in an alkaline solution – before being made into dough. Then, the dough is used to create tortillas, which are then cut and either baked or fried into chips. The term “processed food” typically refers to products manufactured through tertiary food processing.</td>
</tr>
</tbody>
</table>

For further information on methods of food processing read –

Methods of Food Processing  [https://bizfluent.com/info-8111635-methods-food-processing.html](https://bizfluent.com/info-8111635-methods-food-processing.html)

To explore more examples of food processing techniques and the purpose of food processing read this article.


Processed food, nutrition and health

As indicated above most foods as purchased and consumed are processed to some extent. For this reason, popular criticisms of ‘processed food’ are not useful, particularly with reference to the nutritional value and health consequences of consumption. The NOVA classification of foods, now used internationally by WHO and FAO, helps to bridge this gap.

NOVA classifies all foods and food products into four groups as shown in the table below according to the nature, extent and purposes of the industrial processes they undergo.

<table>
<thead>
<tr>
<th>NOVA group</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP 1: Unprocessed and minimally processed foods</td>
<td>Edible parts of plants and animals after separation from nature or modified/ preserved by minimal processes with no substances added (eg freezing, pasteurisation, fermenting, drying, bottling, packaging)</td>
<td>Edible parts of plants (fruit, stems, leaves, seeds, roots) or animals (muscle, offal, eggs, milk) as well as fungi, algae and water</td>
</tr>
<tr>
<td>GROUP 2: Processed culinary ingredients</td>
<td>Substances extracted from group 1 foods or else from nature by processes such as pressing, refining, grinding, milling, and drying.</td>
<td>Salt, sugar, flour, oils or fats traditionally used to prepare, cook and season groups 1 &amp; 2 foods but rarely consumed by themselves. Now used at industrial levels as a dominant ingredient in ultra-processed foods</td>
</tr>
<tr>
<td>GROUP 3: Processed foods</td>
<td>Group 1 foods modified with the addition of salt, sugar, oils, fats to preserve and enhance their sensory qualities. Most have two or three ingredients and usually retain the basic identity of the original food.</td>
<td>Canned or bottled vegetables or legumes (pulses) preserved in brine; whole fruit preserved in syrup; tinned fish preserved in oil; some types of processed animal foods such as ham, bacon, pastrami, and smoked fish; most freshly baked breads; and simple cheeses to which salt is added</td>
</tr>
<tr>
<td>GROUP 4 Ultra-processed foods</td>
<td>Formulations resulting from a sequence of processes that include fractioning whole foods into substances, modification and recombination of these substances, use of cosmetic additives and sophisticated packaging, all aiming to obtain durable, ready-to-consume, hyper-palatable and profitable products with potential to replace all other food groups with foods of low nutritional value.</td>
<td>Carbonated soft drinks; sweet, fatty or salty packaged snacks; candies; mass produced packaged breads and buns, cookies (biscuits), pastries, cakes and cake mixes; margarine and other spreads; sweetened breakfast ‘cereals’ and fruit yoghurt and ‘energy’ drinks; pre-prepared meat, cheese, pasta and pizza dishes; poultry and fish ‘nuggets’ and ‘sticks’; sausages, burgers, hot dogs and other reconstituted meat products; powdered and packaged ‘instant’ soups, noodles and desserts; baby formula</td>
</tr>
</tbody>
</table>

Ultra-processed foods are the group most associated with poor nutritional intake and the occurrence of several non-communicable diseases, including obesity and obesity-related outcomes, cardiovascular and metabolic diseases, breast and all cancers, depression, gastrointestinal disorders, frailty in the elderly, and also premature mortality.

The high or excessive content of added sugar, saturated and trans fats, and sodium, and also high dietary energy density; and low content of protein, fibre and potassium certainly contribute, but there is also growing evidence the extensive processing per se is part of the problem, affecting the way food is digested and metabolised in the body.
The convenience and attractiveness of ultra-processed foods as defined by NOVA and their aggressive marketing, are among the reasons why they now amount to about half of the total dietary energy consumed in high-income countries including Australia.

### Forms of common foods classified by level of processing using NOVA

<table>
<thead>
<tr>
<th>Group 1 Minimally processed</th>
<th>Group 3 Processed</th>
<th>Group 4 Ultra-processed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>Canned corn</td>
<td>Corn chips</td>
</tr>
<tr>
<td>Apple</td>
<td>Apple juice</td>
<td>Apple flavoured do-nut</td>
</tr>
<tr>
<td>Potato</td>
<td>Baked potato</td>
<td>French fries</td>
</tr>
<tr>
<td>Beef</td>
<td>Minced beef</td>
<td>Beef sausage</td>
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<tr>
<td>Wheat</td>
<td>Flour</td>
<td>Cookies</td>
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</tbody>
</table>

### Ultra-processed foods and environment

Ultra-processing of foods also contributes significantly to total food-related environmental effects. In Australia, this amounts to 35 percent of water use, 39 percent of energy use, 33 percent of carbon dioxide equivalents, and 35 percent of land use. If dietary trends continue, per-capita greenhouse-gas emissions from empty calories are estimated to nearly double by 2050. Therefore, reduction of ultra-processed food consumption is a priority for reducing the environmental effects of the food system.

For further information on ultra-processed foods and NOVA classification read –


For further information about how potatoes can be processed refer to –

Potato Processing and Uses  
[https://cipotato.org/potato/potato-processing-uses/](https://cipotato.org/potato/potato-processing-uses/)
Food Processing and Nutrition

Student Activity Sheet

The ‘Farm to Fork’ game requires you as the player to grow, process, manage the waste and market potatoes from the farm to the fork.

Section 1:

Let’s play

1. Play the game and see what potato products you can produce and sell.

After playing the game answer the following questions and write your responses on paper or a workbook.

2. What were the 4 potato products you had to produce in the game?

Let’s do some research on food processing

3. As a class discuss food processing techniques.

There are different grades of processing techniques, provide examples for each grade:

<table>
<thead>
<tr>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
</tr>
</thead>
</table>

4. Define the following terms and give an example of a food product for each
   - Minimally processed
   - Processed
   - Ultra-processed

5. What techniques do you think were used to produce the 4 potato products in the game? Record your findings in your workbook.

Watch these videos to assist you.

How to Make Potato Chips - Factory Production
https://www.youtube.com/watch?v=REqhl-s97LE

BetaSpuds – Fresh Potato Processing
https://youtu.be/i6Sfhhg0fU

How It’s Made - 323 Frozen French Fries
https://www.youtube.com/watch?v=vjs1LLaxXrA&feature=youtu.be

How It’s Made Potato Salad
https://www.youtube.com/watch?v=GBzi1daU774
Section 2:

Let’s explore the nutritional value of potato products:

Use online shopping websites to find samples of the 4 potato products you made in the game, these sites should include pictures of the packaging and food labelling information.

1. In a group of 4 select one of these products per person and research -
   a) the ingredients in the product
   b) the nutritional value - Energy (KJ)
      - Fat (g)
      - Sugar (g)
      - Salt/Sodium (g)
   c) write a nutritional label for this product using the template attached
   d) list the food processing techniques you think where used to produce this item, is it unprocessed, minimally processed or ultra-processed?
   e) consider how much waste you think was created when producing this product and where the waste come from.

You can record all this information on the Product Information worksheet provided.

Let’s share:

2. As a class you are going to place your food item on 4 continuums provided by your teacher on the board.
   a) Healthy food choice – Not so healthy food choice
   b) Minimally processed – Processed – Ultra-processed
   c) Minimal waste – A lot of waste
   d) Cost $1/kg – $10/kg

Based in the ingredients and the nutritional value, where on the continuum a) would you place your food item?

Let’s review:

3. Looking at the continuums which potato product is the ‘best choice’ to purchase if you were given an option as a consumer? What factors would influence your purchasing decision?
4. Do food processing techniques have an impact on the nutritional value of potatoes? Explain.
5. If processed products are higher in fat, salt and sugar and lower in dietary fibre what health impacts does this have on the consumer?
6. According to the nutritional values of each potato product which is the healthiest way to prepare potato?
7. Does the level of processing a product goes through, have an impact on the amount of waste produced during production? Explain.
8. What impact can this have on our environment and what as consumers can we do to reduce waste from food production?

Let’s play again:

Play ‘Farm to Fork’ again. This time aim to produce food products that are minimally processed and have better nutritional value and to see what impact that has on the amount of waste produced during processing and the Waste Meter.

Also consider what health benefits there are for the consumers if there are healthier options available in the store.
### Potato Crisps

**Ingredients:**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Nutrition Value (g/100g)</th>
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<tbody>
<tr>
<td>Energy</td>
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<td>Fat</td>
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<td>Sodium</td>
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<td>Sugar</td>
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<tr>
<td>Dietary Fibre</td>
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**Food processing techniques used:**

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<th>Technique</th>
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**Cost/KG:**

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<th>Cost/KG</th>
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**Nutritional Value (g/100g):**

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<th>Nutrient</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Energy</td>
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<td>Fat</td>
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<td>Sodium</td>
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<td>Sugar</td>
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<tr>
<td>Dietary Fibre</td>
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**Waste produced in production:**

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### Potato Fries

**Ingredients:**

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<tr>
<th>Ingredient</th>
<th>Nutrition Value (g/100g)</th>
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<td>Energy</td>
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<tr>
<td>Fat</td>
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<tr>
<td>Sodium</td>
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<td>Dietary Fibre</td>
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**Food processing techniques used:**

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**Cost/KG:**

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**Nutritional Value (g/100g):**

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<tr>
<th>Nutrient</th>
<th>Amount</th>
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<tr>
<td>Energy</td>
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<td>Sugar</td>
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<td>Dietary Fibre</td>
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</table>

**Waste produced in production:**

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**Food Processing and Nutrition** teaching and learning activity
## Potato Salad

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Nutritional Value /100g</th>
<th>Food processing techniques used</th>
<th>Cost/KG:</th>
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<thead>
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<th>Nutritional Value /100g</th>
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<tr>
<td>Energy</td>
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<tr>
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## Whole Potato

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Nutritional Value /100g</th>
<th>Food processing techniques used</th>
<th>Cost/KG:</th>
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<tr>
<th>Nutritional Value /100g</th>
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<tr>
<td>Energy</td>
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<td>Fat</td>
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<tr>
<td>Sodium</td>
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<tr>
<td>Sugar</td>
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<td></td>
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<tr>
<td>Dietary Fibre</td>
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Learning Task Intention:

At the end of this activity students should be able to:
- Understand how food wastage can occur in the food production system
- Understand the impact food waste has on the environment
- Explore strategies to reduce food waste at different points of the food production chain

Background Information:

In Australia:
- The Government estimates food waste costs the Australian economy $20 billion each year.
- Over 5 million tonnes of food end up as landfill from households and the commercial sector.
- One in five shopping bags full end up in the bin = $1,050 worth of groceries for the average household each year.
- 35% of the average household bin is food waste.


Conventional food systems are based on maximising efficiency and rely heavily on the use of fossil fuels like coal, gas and diesel and the use of fertilizers to maintain food production; this can also cause problems with greenhouse gas emissions and other pollution.

In the game ‘Farm to Fork’, the potato food chain produces food waste at each stage of the game and as a result the waste metre increases. For example, when potatoes are left in the ground too long the crop spoils, making these potatoes go to waste and the waste meter to increase. This type of waste in production is referred to as food loss. Waste is also generated in the game via food processing.

There are many ways to help reduce food waste and there are many current initiatives regarding food waste or food/energy conversion.

Ways to reduce food waste can include:
- Excess donated to soup kitchens.
- By products fed to livestock
- Manufacture of biofuels and by-products such as building materials
- Composting
- Reducing at the source—individuals can avoid purchasing food they will not use, purchase locally grown

Teaching Recommendation:

This learning task focuses on the Waste Management level of the game and can be completed across 2-3 lessons in a Design and Technology-Food or a Humanities and Social Sciences context. Teachers can use the ‘Farm to Fork’ game to develop students understanding of food waste and its impact on the environment.

It is recommended that students play the game once, then discuss their observations about waste in the game before playing the game again with the specific target of keeping the Waste Meter low.

The Waste Meter is in the bar at the top of the game screen.
Equipment/Materials Required:

- iPad for individual or partner use
- The app Farm to Fork ECU by Edith Cowan University
- Internet access for student research.

Key Words:

Food waste, compost, biofuels, food system, environment
### Lesson Sequence Overview:

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<thead>
<tr>
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<th>TEACHER FOCUS QUESTIONS</th>
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<tbody>
<tr>
<td><strong>Lesson 1</strong></td>
<td></td>
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<tr>
<td><strong>INTRODUCTION</strong></td>
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<tr>
<td></td>
<td>What is food waste?</td>
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<td></td>
<td>- Discuss examples food waste.</td>
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<td></td>
<td>Why is food wasted?</td>
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<td></td>
<td>What happens when organic waste goes into landfill?</td>
</tr>
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<td></td>
<td>What gas is produced?</td>
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</tbody>
</table>
|                   | Review Australia’s Food Waste statistics. Display this infographic for students to read and discuss.  
|                   | Additional information:  
| **ACTIVITY 1**   |                         |
|                   | Explain that all food comes on a journey before we eat it.  
  Display the Food System Model  
|                   | When in the food supply process does waste occur? |
| **ACTIVITY 2**   |                         |
| Play ‘Farm to Fork’ Game | Guide students to access and play ‘Farm to Fork’.  
  10 minutes into game, stop students and ask them to locate the Waste Meter.  
  Ask students - where they have seen waste being produced. How much have they produced?  
  Allow students to finish the game by successfully selling 20 Potato Salads and 30 bags of whole potatoes  |
| **ACTIVITY 3**   |                         |
| After playing the game. | Guide students through a reflection on what they learnt about potato waste while playing the game.  
  Environmental hazards – food scraps in landfill create methane  
  Alternate uses include – biofuel – ethanol used for energy, animal feed  |
| - List the 4 stages of the game  | Discussion questions -  
  What can we do to reduce the amount of food being sent to landfill?  
  What are the advantages of composting organic waste?  |
| - Identify what waste is produced in each stage of the game.  | Additional information:  
  [https://cipotato.org/potato/potato-processing-uses/](https://cipotato.org/potato/potato-processing-uses/)  |
| - What impact can the potato waste have on the environment?  |                         |
| - What alternative products can be produced from potato waste?  |                         |
### Lesson 2

#### INTRODUCTION

**ACTIVITY 1**

Replay ‘Farm to Fork’ with the aim to keep the waste meter as low as possible.

Review the previous lesson and summarise what they learnt about food waste.

Discuss what strategies players must take to keep waste at a minimum.
- E.g. Add water and soil improver to limit spoilt crops.
- Produce whole potatoes and salad, not chips and crisps.
- Don’t allow waste to go to landfill.
- Sell more whole potatoes and salad by advertising healthier alternatives at the market.

**ACTIVITY 2**

Research food waste in Australia.

Create a flyer/poster/infographic which outlines food waste. Include:
- A definition/description of food waste
- Statistics
- What impacts food waste has on our environment.
- Suggested ways in which we can reduce food waste at home.
- Suggested ways in which we can reduce food waste in the food system.
- Find a local organisation what is helping to fight the war on food waste. Promote this organisation in your flyer/poster/infographic.

Ask the class
- How much food is wasted in Australia each year?

Ask students to report their findings back to the class.

---

### Links to Other Resources:

- Additional Australian food waste information
Learning Task Intention:

At the end of this activity students should be able to:

- Identify how businesses respond to demand of consumers

Background Information:

This lesson sequence explores how businesses respond to, and influence, the changing demands of consumers in contemporary Australia. The ‘Farm to Fork’ game is employed as a springboard to examine the relationship between consumers and producers. During these lessons, students will conduct independent research, collaborate with peers and participate in whole-class activities to explore the concept of business-consumer interdependence. Students will also explore how consumers’ preferences change and the ways in which businesses respond to this, from marketing to environmental awareness. Finally, students will engage with the concept of sustainable food production and begin to explore how businesses set prices for their products.

Teaching Recommendation:

This learning task focuses on the Marketing, Access and Consumption level of the game and could be taught over 4 lessons as part of an Economics and Business unit following an investigation of how consumers rely on businesses to meet their needs and wants. The focus is primarily on how businesses respond to the changing demands of consumers but could extend (given sufficient time) into product pricing strategies.

Equipment/Materials Required:

- iPad for individual or partner use
- Farm to Fork ECU by Edith Cowan University https://apps.apple.com/au/app/farm-to-fork-ecu/id1513353482
- Internet for research

Key Words:

Consumer, demand, market, producer, good, service, economy

Acknowledgement:

This learning activity was created for ‘Farm to Fork’ by ECU School of Arts and School of Education alumnus Dr Benjamin Alexander Hale.
Lesson Sequence Overview:

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<tbody>
<tr>
<td><strong>Lesson 1</strong></td>
<td></td>
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<tr>
<td>1. Review of prior learning – How consumers rely on businesses.</td>
<td>- What is a producer?</td>
</tr>
</tbody>
</table>
| 2. Introduce this week’s learning goals:  
  i) To identify how businesses, respond to the different demands of consumers.  
  ii) To explain the different ways businesses and producers are interdependent. | - What is the difference between a good and a service? What is the difference between a need and a want? |
| 3. Introduce the concept of interdependence between consumers and producers. | - How do consumers rely on businesses? |
| 4. Class discussion to review students’ prior understandings | - Can anyone explain what interdependence means? What does it mean in this context? |
| 5. Activity – ‘Farm to Fork’  
  a. Provide a (very) brief walkthrough of how the ‘Farm to Fork’ game works and expectations of conduct.  
  b. Allow students to play through the game – making a note of any pertinent questions. | - How do businesses respond to the demands of consumers? |
| 6. Plenary discussion  
  a. Ask about their performance and draw attention to the producer consumer relationship in the game. | - How did everyone do? Who got the highest score? What choices did you make? |
<p>| 7. Exit Ticket - Answer the following question: How are consumers and producers interdependent? | - What did you do that we could learn from - i.e. did you buy any upgrades early on or advertise specific products? |
|                    | - Did this change? How? Why do you think this is? How does this relate to the concept of interdependence? |</p>
<table>
<thead>
<tr>
<th>STUDENT ACTIVITY</th>
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<tbody>
<tr>
<td><strong>Lesson 2</strong></td>
<td></td>
</tr>
<tr>
<td>1. Review of previous lesson.</td>
<td>What is the relationship between consumers and producers?</td>
</tr>
<tr>
<td>2. Define ‘market research’ and explain its relevance to the topic.</td>
<td>- How would you come to this decision?</td>
</tr>
<tr>
<td>3. Think-Pair-Share: If you were to start a business in your pair and sell a good or service, what would you sell and why?</td>
<td>- Which of these factors did you consider when deciding what potato products to make in the game? Why?</td>
</tr>
<tr>
<td>a. Students make a list as a class of the factors that you would consider as a business owner when deciding what good or service to sell.</td>
<td>- Was anyone surprised by anything they found out? Why was that surprising?</td>
</tr>
<tr>
<td>4. Students explore the Australian Institute for Health and Welfare webpage on food and nutrition in Australia. [AIHW] Food &amp; Nutrition</td>
<td>- It states that Australians of all ages have a poor diet – why might this be the case? What does the website say?</td>
</tr>
<tr>
<td>5. Summary of Australian eating habits – Top ten traditional Australian foods (Resource Sheet1)</td>
<td>- Why is that a healthier alternative? What else could you eat instead? What other factors might affect what (or where) we choose to eat? i.e. ethics of the business; environmental impact; community and charity involvement.</td>
</tr>
<tr>
<td>a. Students list 2-3 foods/drinks they frequently eat/drink and research healthier alternatives.</td>
<td>- What factors affect how we spend money on food/drinks? How do businesses respond to the changing preferences of Australian consumers?</td>
</tr>
<tr>
<td>b. Conduct a class discussion</td>
<td></td>
</tr>
<tr>
<td>6. Students read about Australia’s changing food habits and answer comprehension questions on the written handout Australia’s Changing Food habits Student Activity Sheet</td>
<td></td>
</tr>
<tr>
<td>c. Conduct a plenary discussion</td>
<td></td>
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</table>
**STUDENT ACTIVITY**

**Lesson 3**

1. Review of previous lesson
2. Think-Pair-Share: What makes a business “environmentally friendly”?
3. Environmental Sustainability
4. Watch the World Wildlife Fund (WWF) video [Change the Way You Think About Food](#) and ask comprehension questions
   a. Students read through the webpage on food production’ answer questions i-iii.
   i. How does food production affect the environment?
   ii. What is sustainable food production?
   iii. How can we make food production more sustainable?
5. Shaping consumer decisions
   a. Class Discussion: Do consumers always know what they want or can producers shape their preferences? How?
   b. Explain how companies use advertising to shape consumer behaviour – For examples use advertisements for [video] Kia Nero Eco and [video] Old Spice Danger Zone
6. Conduct a plenary discussion

**TEACHER FOCUS QUESTIONS**

- What are Australia’s most popular traditional foods? What factors might you consider when selling a product/service?
- Is there a problem with how we use land? What about water? How can we fix this?
- What are some examples of environmentally friendly changes to Australian products?
- Is this environmentally responsible? How? Could this be applied elsewhere?
- How does marketing affect what we buy? i.e. brand identification, aspirational lifestyle, aligned values.
- What food products have you seen advertised on TV recently? Are they shown to be healthy/environmentally friendly/nutritious? Why do you think this is (or isn’t) the case?
- What makes an environmentally sustainable business? How do producers shape consumers preferences?
STUDENT ACTIVITY
Lesson 4
1. Review of previous lesson
2. In groups students reattempt the ‘Farm to Fork’ Game with different objectives
   a. In each group two students are selected to attempt each of the following: i) positively affect the health of the town (nutrition); ii) produce as little waste as possible; or, iii) make as much money as possible. Scores are calculated from the average of each group.
   b. Class discussion – establish the reasons for success (or failure)
   c. Think-Pair-Share: Are these objectives totally independent or is there a link between them?
3. Pricing Strategies
   a. Establish how businesses set prices for goods and services.
   b. Using the handout (Different Pricing Strategy Student Activity Sheet) explain and discuss different pricing strategies.
   c. Earlier this week I asked you “If you were to start a business in your pair and sell a good or service, what would you sell and why?”, now I want you to write a short response outlining which pricing strategy you would use and why.
   d. Conduct a class discussion to clarify any misunderstandings among students.

TEACHER FOCUS QUESTIONS
• What is an environmentally friendly business? How does marketing affect what we buy?
• Which groups did the best? Why do you think that is?
• What did you find the most challenging about this activity? Why was that difficult?
• How does this relate to customer preferences?
• How do businesses set a certain price for a product?
• What factors might affect how much a potato product costs? i.e. demand, competition, prestige.
• Who believes they have achieved goal a/b?
• So, how do businesses respond to consumers preferences? What are some of these preferences?
• How are businesses and producers interdependent? Explain.

Links to Other Resources:
[webpage] [AIHW] Food & Nutrition
[webpage] What the changing food habits of Australians tell us
[video] WWF – Change the Way You Think About Food
[webpage] Food Production: A sustainable food supply
[video] Woolworths’ Zero Waste Trial
[video] Kia Nero Eco
[video] Old Spice Danger Zone

Created Resources*
Australia’s top ten traditional foods (Resource 1)
[Handout] Australia’s changing food habits (Resource 2)
[Handout] Different pricing strategies (Resource 3)
*Created by Dr Benjamin Alexander Hale
Australia’s top ten most popular ‘traditional’ foods

Resource Sheet

#1 Chicken Parmigiana

#2 Barbequed snags (Sausages)

#3 Lamingtons

#4 Anzac Biscuits

#5 Pavlova

#6 Meat Pies

Off to Market teaching and learning activity
Australia’s top ten most popular ‘traditional’ foods

#7 Fish & Chips

#8 Vegemite on Toast

#9 Cadbury Cherry Ripe

#10 Fairy Bread
Australia’s Changing Food Habits

Student Activity Sheet

Read the following article [What the changing food habits of Australians tell us](#) and answer the questions below:

1. What are the four major trends in Australian eating/drinking habits?

________________________________________________________________________

________________________________________________________________________

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2. Are Australians eating enough fruit and vegetables? Yes / No

3. What percentage of Australians are eating their lunches at their desks? _________

4. Sourdough producers are more trustworthy than other bread producers? True / False

5. What is an example of retailers attempting to reduce food waste?

________________________________________________________________________

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6. Which of the four food trends identified in the article is related to environmental issues?

________________________________________________________________________

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[Off to Market](#) teaching and learning activity
There is a link between the price charged for an item or service and the quantity bought. For example, if a Cherry Ripe was to rise from $1 to $2 per bar and the size did not change then many customers would stop buying them. Instead, they would purchase a different chocolate bar. To generalise, a rise in price (in most cases) = drop in demand for the product.

However, this is not always the case! Some necessary commodities will not fall in demand despite rising prices. An example of this is petrol - most motorists will purchase the same amount of petrol regardless of an increase or decrease in price.

Businesses have to decide what price they want to charge for their goods or services. They know if the price they set is too high then the demand will be low. There are, however other factors that need to be considered when setting prices.

- **Competition based pricing** – businesses must charge around the same price as their competitors or consumers will go elsewhere.

- **Prestige pricing** – charging a higher price because of the reputation of a product e.g. Apple iPhones, Tesla Cars, or Margaret River chocolate.

- **Discrimination pricing** – charging different prices for different people e.g. student discount or senior citizen specials.

- **Penetration pricing** – cheaper prices to get noticed in a new market. You start off with a low price to get people interested, then increase it as time goes on.

- **Price Skimming** – setting a high price for a new product before other competitors come into the market, i.e. iPhone 11, Samsung Galaxy S20, Nintendo Switch.

**TASK:**

Write a short response outlining and explaining which pricing strategy you would use for the business you made up earlier in the week.

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Learning Task Intention:

At the end of this activity students should be able to:

- Examine persuasive advertising techniques and how these can be used to promote food options.
- Describe how food marketing influences food choices.
- Plan and develop an information resource to promote healthy food options to students in the school.

Background Information:

In the game, the player puts together a range of food advertisement posters to promote healthy, sustainable options of potatoes to the people of Potato town. These posters help change the food choices of the town’s people and increase the wellbeing of the population, improve the food supply chain and reduce waste.

Students learn to:

Choose foods in season, locally grown, healthier side dishes when dining out, choosing minimally processed foods without added sugar, salt and fat.

Teaching Recommendation:

This learning task focuses on the Market level of the game. It aims to highlight the influences advertising has on our food choices. The task is designed to be taught over 2-3 lessons but can be extended with an individual/small group project task at the end.

The game ‘Farm to Fork’ is used to introduce the topic of food marketing/advertising and the influences it has on our food choices.

Equipment/Materials Required:

- iPad for individual or partner use
- Farm to Fork ECU by Edith Cowan University
- Internet access
- Printed handouts of food advertisements from ‘Farm to Fork’.

Key Words:

Marketing, influences on our food choices, healthy eating
Lesson Sequence Overview:

<table>
<thead>
<tr>
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<tr>
<td><strong>INTRODUCTION</strong></td>
<td></td>
</tr>
<tr>
<td>• Class brainstorm/discussion</td>
<td>What are the benefits of eating nutritious foods for our health/our environment and our budget? What do we consider a healthy/nutritious food? Discuss the Australian Guide to Healthy Eating and 5 Food Groups.</td>
</tr>
<tr>
<td><strong>ACTIVITY 1</strong></td>
<td>Introduce the game ‘Farm to Fork’. Potato Town are in a Junk Food (ultra-processed food) Crisis and it is impacting the health of its community.</td>
</tr>
<tr>
<td><strong>PLAY – ‘Farm to Fork’</strong></td>
<td>Tell students they are to play this game from start to finish and try to improve the eating habits of the people.</td>
</tr>
<tr>
<td></td>
<td>Start by playing the game once just to get used to playing it. This will take approximately 15 minutes. Stop students after 15 minutes and see who successfully completed the game.</td>
</tr>
<tr>
<td></td>
<td>Facilitate a discussion about what students had to do in the game. What do you have to do to finish the game? Direct Students to the To Do list to see what needs to be done to finish the game.</td>
</tr>
<tr>
<td></td>
<td>Were students successful in selling 20 Salads and 30 bags of potatoes? What do you have to do to change the consumers’ choices in the market?</td>
</tr>
</tbody>
</table>
Lesson 1 cont’d

PLAY ‘Farm to Fork’ again.
Focus on –

Market demand and poster advertisements to successfully complete the game.

Lesson 2

INTRODUCTION

Class discussion/review of game

Consider the learnings from playing the game that promoted selling a healthy product (foods in season, locally grown, healthier side dishes, choose minimally processed food without added salt, sugar and fat).

ACTIVITY 1

Advertising techniques*

In groups, students discuss and list strategies and examples they have seen advertising companies use to grab viewer attention on TV or other advertising media to buy their food or drink products.

Students report back to class. List common strategies from group discussions on the board.

*Adapted from Refresh.ED Influences on our Choices

TEACHER FOCUS QUESTIONS

Highlight to students the Market Demand Board in the market and how to access it.
Highlight the need to buy the poster advertisements to change the Market Demand to successfully sell 20 salads and 30 bags whole potatoes.
Highlight the nutrition panel at the top of the screen.

To Win – Fill the nutrition bar to 100% by selling health products.

Class brainstorm/discussion to review the game. Focus on how advertising influenced the market demand (what customers wanted to buy).

Explain advertising companies use a variety of strategies to encourage consumers to buy their food and drink products. Often, they try to sell a lifestyle or an image, rather than their product (See How Food Advertising Works Resource Sheet 1)
<table>
<thead>
<tr>
<th>STUDENT ACTIVITY</th>
<th>TEACHER FOCUS QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson 2 cont’d</strong>&lt;br&gt;ACTIVITY 2&lt;br&gt;As a class watch a few food advertisements.</td>
<td>View examples of television food commercials targeting children (some links provided below in Links to Other Resources).&lt;br&gt;&lt;br&gt;<strong>Ask:</strong>&lt;br&gt;- What strategies did each advertisement use to grab your attention or make you want to buy this product?&lt;br&gt;- How do these strategies make you feel about the products advertised?&lt;br&gt;- Do they make you feel you must buy the products?&lt;br&gt;- Why is it good for food companies if their advertisements make you want to buy their product?&lt;br&gt;- Do you think these advertisements might make it harder for parents to give their children a healthy diet?&lt;br&gt;- Do you think there are more advertisements for unhealthy food than healthy foods on TV or in magazines and newspapers? Why?</td>
</tr>
<tr>
<td>Class discussion.</td>
<td></td>
</tr>
<tr>
<td><strong>Lesson 3 &amp; 4</strong>&lt;br&gt;ACTIVITY 1&lt;br&gt;Students are to review the game advertisements and think about how these ads influenced the choices the towns people made in the market. Then consider how the healthier food choices would have improved the towns people’s health.</td>
<td>Provide students with the 4 printed handouts of food advertisements from the game (See How Food Advertising Works Resource Sheet 2).</td>
</tr>
</tbody>
</table>

How Advertising Works teaching and learning activity
<table>
<thead>
<tr>
<th>STUDENT ACTIVITY</th>
<th>TEACHER FOCUS QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACTIVITY 2</strong></td>
<td><strong>Create an ad of your own.</strong></td>
</tr>
<tr>
<td>2. Create or find a healthy potato recipe that would be suitable to sell in the school canteen.</td>
<td></td>
</tr>
<tr>
<td>3. Using suitable advertising techniques create a food advertising campaign/information resource which will promote the sale of your healthy recipe to the students in your school.</td>
<td></td>
</tr>
<tr>
<td>4. Present the final product in a form such as written document, multimedia production, poster, pamphlet, fact sheet. With the aim to “Sell” their product.</td>
<td></td>
</tr>
<tr>
<td>Facilitate students to use the understanding of advertisings and healthy food product that they have gained throughout this learning task.</td>
<td></td>
</tr>
<tr>
<td>They are then required to create their own advertisements for a healthy potato product that could be sold at the school canteen.</td>
<td></td>
</tr>
<tr>
<td>Things to consider:</td>
<td></td>
</tr>
<tr>
<td>• What advertising techniques can you use to promote this product to the students in your school?</td>
<td></td>
</tr>
<tr>
<td>• How can this food be prepared in a healthy way?</td>
<td></td>
</tr>
<tr>
<td>• What might the nutrition information panel look like for your product?</td>
<td></td>
</tr>
</tbody>
</table>

Links to Other Resources:

- **Refresh.ED** – Food and Drink CHOICE section encompasses promoting skills, knowledge and understanding of concepts relating to food selection and influences, finding and interpreting nutrition information including food labels, shopping and budgeting.
  - Within this focus area, we recommend Influences on our Choices (Year 5) to compliment this learning activity. [https://www.refreshedschools.health.wa.gov.au/k-10-curriculum-materials/](https://www.refreshedschools.health.wa.gov.au/k-10-curriculum-materials/)

Example Advertisements for Lesson 2 Activity 1

- [https://www.youtube.com/watch?v=z-hT5xALpDY](https://www.youtube.com/watch?v=z-hT5xALpDY) - Kellogg’s Froot Loops
- [http://www.youtube.com/watch?v=QdRW3djK6pA](http://www.youtube.com/watch?v=QdRW3djK6pA) - Cottee’s Cordial
- [https://www.youtube.com/watch?v=lhsHbjFcc-Q](https://www.youtube.com/watch?v=lhsHbjFcc-Q) - McDonald’s Happy Meal
- [https://www.youtube.com/watch?v=Dsatt18rxvk](https://www.youtube.com/watch?v=Dsatt18rxvk) – Kellogg’s LCMs

Healthy foods


Food Labelling

How Food Advertising Works

Resource Sheet 1

Advertisers use lots of tricks to make us want to buy their food and drink products. For example:

<table>
<thead>
<tr>
<th>Ideal kids and families –</th>
</tr>
</thead>
<tbody>
<tr>
<td>who have big happy smiles and care for each other.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Family fun –</th>
</tr>
</thead>
<tbody>
<tr>
<td>where dinner turns into a party because everyone is eating this product.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Excitement –</th>
</tr>
</thead>
<tbody>
<tr>
<td>where one bite of a snack bar makes your life more exciting or you become a more ‘cool’ person.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Star power –</th>
</tr>
</thead>
<tbody>
<tr>
<td>where a popular sports star is telling you what to eat.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bandwagon –</th>
</tr>
</thead>
<tbody>
<tr>
<td>where if you don't eat this product you will be made to feel left out.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scale and appearance –</th>
</tr>
</thead>
<tbody>
<tr>
<td>where the product looks bigger or smaller than it actually is and looks more appealing than it does in real life.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Animated characters -</th>
</tr>
</thead>
<tbody>
<tr>
<td>where a character is used to increase children's interest</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Repetition –</th>
</tr>
</thead>
<tbody>
<tr>
<td>where you hear the same message or ad over and over.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Music and jingles –</th>
</tr>
</thead>
<tbody>
<tr>
<td>where sound effects add to the excitement and make you remember the product.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Freebies –</th>
</tr>
</thead>
<tbody>
<tr>
<td>where free give-aways, prizes or tokens to collect are on offer.</td>
</tr>
</tbody>
</table>

Adapted from *Refresh.ED — Influences on Our Choices Learning Unit.*
**How Food Advertising Works**

*Resource Sheet 2*

---

**BUY TRUE VALUE FOR MONEY ADVERTISEMENT**

**AIM:** Create a poster that highlights the value of buying locally grown potatoes.

**FACTS:**
1. Transporting, storing, processing and packaging foods all have nutritional, waste and other environmental costs. 2. Seasonal, locally grown food with minimal processing is the best value for money.

**TASK:** Drag & drop from options in the 3 columns to create your poster.

<table>
<thead>
<tr>
<th>Options</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canned potatoes</td>
<td>$3.90/ Kg</td>
</tr>
<tr>
<td>Frozen Roast Potato</td>
<td>$6.25/ Kg</td>
</tr>
<tr>
<td>Local Baby Potatoes</td>
<td>$2.50/ Kg</td>
</tr>
<tr>
<td>Imported Kipfler potatoes</td>
<td>$7.00/ Kg</td>
</tr>
</tbody>
</table>

Choose one statement to support your advertisement:

- Time-saving prepared potatoes for your convenience
- Buy in-season and pay less for freshness
- Forget the cost. Buy imported potatoes all year round
- Choose local and save more than money

---

**True Value For Money In Supermarkets**

PUT IMAGE HERE

---

*How Advertising Works teaching and learning activity*
How Food Advertising Works

**FILL YOUR MENU WITH GREEN ADVERTISEMENT**

**AIM:** Create a poster that promotes a green option of the traffic light system used in school canteens.

**FACTS:** Green foods are the healthiest. They come from the five food groups and are low in fat, sugar and salt, and high in fibre.

**TASK:** DRAG & DROP from options in the 3 columns to create your poster.

---

**Look at the nutrition information panels to find the Green food**

- **Crisps**
  - Nutrition Information
  - Quantity per 100g serve Fat: 35g, Dietary Fibre: 3g

- **Potato Gems**
  - Nutrition Information
  - Quantity per 100g serve Fat: 7.5g, Dietary Fibre: 0g

- **Jacket Potato**
  - Nutrition Information
  - Quantity per 100g serve Fat: 4.5g, Dietary Fibre: 1g

---

**Add the Green food picture!**

- Crisps
- Potato Gems
- Jacket Potato

---

**Choose one supportive advertising statement**

- **Look after yourself, choosing healthy food isn’t hard!**
- **Quick and easy vegetable food packaged to go.**
- **Fresh, low-fat food to help you perform your best.**
- **Tastes great, you’ll enjoy that fatty mouth feel!**

---

**HEY STUDENTS!**

**FILL YOUR MENU WITH GREEN**

**PUT IMAGE HERE**

**ADVERTISING STATEMENT #1**

---

*How Advertising Works* teaching and learning activity
How Food Advertising Works

Easy Healthy Recipes Advertisement

**AIM:** Create a poster that informs customers about healthy, low waste ways to cook and prepare potatoes.

**FACTS:**
1. Potatoes are a whole food low in fat and salt.
2. Recipes can add variety and taste but vary in nutritional value and amount of waste.

**TASK:** DRAG & DROP from options in the 2 columns to create your poster.

Drag the most nutritious, tasty and least wasteful jacket potato filling option onto the poster.

**Bacon & cheese filling**
- Ingredients:
  - 2 bacon rashers, chopped
  - 1 tsp vegetable oil
  - 1/4 cup sour cream
  - 1 tbsp chopped chives
  - 1/4 cup grated cheese
- Method:
  2. Add other ingredients
  3. Mix with 2 tbsp scooped potato.

**Chilli bean filling**
- Ingredients:
  - 1/2 small onion, chopped
  - 1 tbsp vegetable oil
  - 1 small clove garlic, chopped
  - 1/2 tsp chilli powder
  - 220g tin baked beans
- Method:
  1. Heat oil, fry onion and garlic 2-3 min, or until soft.
  2. Add chilli powder and fry 1 min.
  3. Add baked beans and heat through.

**Tomato & basil filling**
- Ingredients:
  - 2 garlic cloves, chopped
  - 1 tbsp vegetable oil
  - 3 tomatoes, chopped
  - 2 tbsp fresh basil, chopped
  - 1 tbsp pine nuts, toasted
- Method:
  1. Heat oil, fry garlic 1-2min, or until soft.
  2. Add tomatoes. Cook, stirring, reducing to thick sauce.

**Basic Jacket Potato**
- Ingredients:
  - 2 large baking potatoes
  - 1 tsp olive oil
  - 2 tbsp filling eq beans, bacon, tomato
- Method:
  1. Wash the potatoes and prick the skins all over with a fork.
  2. Bake at 220°C for 60-80 minutes.
  3. Cool, then rub the skins all over with the olive oil.
  4. Bake for 15-15 mins or until the skins are starting to crisp.
  5. Split open and add favourite filling.

Choose one statement to support your advertisement:

- **Save time and effort by cooking with convenient packet ingredients.**
- **Eating healthier is easy and rewarding.**
- **You'll satisfy everyone's tastes with this creamy, flavoursome recipe.**
- **Try a simple, tasty recipe with fresh local ingredients.**

---

*How Advertising Works* teaching and learning activity
Would you like Fries or Health as Your side?

**AIM:** Create a poster that motivates people to choose a healthy potato side dish at a fast food outlet.

**FACTS:** 1. Added fat and salt in potato dishes make them high in kilojoules, fat and salt, which can lead to weight gain, heart disease, high blood pressure and other health problems. 2. Making thin fries creates wasted potato peel and offcuts.

**TASK:** DRAG & DROP from options in the 3 columns to create your poster.

**Find the healthiest potato side choice**

<table>
<thead>
<tr>
<th>Potato Side</th>
<th>Nutrition Information</th>
<th>Quantity per 100g serve</th>
<th>Energy</th>
<th>Fat, total</th>
<th>Sodium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fries</td>
<td></td>
<td>1220 kJ</td>
<td>12.0 g</td>
<td>370 mg</td>
<td></td>
</tr>
<tr>
<td>Potato salad</td>
<td></td>
<td>650 kJ</td>
<td>11 g</td>
<td>210 mg</td>
<td></td>
</tr>
<tr>
<td>Steamed potatoes</td>
<td></td>
<td>280 kJ</td>
<td>0.2 g</td>
<td>4 mg</td>
<td></td>
</tr>
</tbody>
</table>

**Choose one statement to support your advertisement**

- When you're hungry fries are a low cost filler
- Put the fries aside and choose a healthier side
- Forget about the waste, there's extra taste.
- You'll get more nutrition and less waste with whole potatoes

**Would you like Fries or Health as Your side?**

PUT IMAGE HERE

**ADVERTISING STATEMENT #1**
Learning Task Intention:

At the end of this activity students should be able to:

• Identify common food preparation techniques.
• Analyse the positive and negative impacts different food processing techniques have on the nutritional value of potatoes.
• Design a range of healthy potato recipes suitable for adolescents.

Background Information:

Prior to the task, students should have knowledge of the Australian Dietary Guidelines and be familiar with the Australian Guide to Healthy Eating. Students will need to be introduced to the production of potatoes within Australian growing regions, including their closest region. Students will be given the opportunity to play the ‘Farm to Fork’ game and gain knowledge of the potato production process.

Teaching Recommendation:

This learning task relates to all levels of the game and could be delivered across 4-6 lessons in a Design & Technologies – Food specialisations context. The activities would be completed after playing the ‘Farm to Fork’ game. This task can be provided electronically or in a booklet form, with the teacher to monitor work completed, appropriateness of actual food order for potato recipe and content.

Equipment/Materials Required:

• iPad for individual or partner use
• Farm to Fork ECU by Edith Cowan University https://apps.apple.com/au/app/farm-to-fork-ecu/id1513353482
• Internet access for student research

Key Words:

Food preparation, Healthy eating, Nutrition, Physical properties, Preparation techniques, Australian Dietary Guidelines, Potatoes,
Lesson Sequence Overview:

<table>
<thead>
<tr>
<th>STUDENT ACTIVITY</th>
<th>TEACHER FOCUS QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson 1</strong></td>
<td></td>
</tr>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td>Class discussion to introduce potatoes –</td>
</tr>
<tr>
<td></td>
<td>- What is a staple food?</td>
</tr>
<tr>
<td></td>
<td>Explore potatoes as an example.</td>
</tr>
<tr>
<td></td>
<td>- Where did potatoes originate from?</td>
</tr>
<tr>
<td></td>
<td>- What are potatoes used for?</td>
</tr>
<tr>
<td></td>
<td>- Where do potatoes fit in to a balanced diet according to the Australian Guide to Healthy Eating?</td>
</tr>
<tr>
<td><strong>Investigating</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- could taste test different types of potatoes as an introduction, as well as exploring different ways they are cooked.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>ACTIVITY 1</strong></th>
<th>Play ‘Farm to Fork’ game.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitate students as they play ‘Farm to Fork’.</td>
<td></td>
</tr>
<tr>
<td>Class discussion about the game – what key concepts does the game cover.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Lesson 2</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACTIVITY 1</strong></td>
<td>Discuss what you have learnt about potatoes from the game.</td>
</tr>
<tr>
<td>Review the game and facilitate a class discussion about potatoes. Consider the following points.</td>
<td></td>
</tr>
<tr>
<td>What conditions do potatoes need to grow?</td>
<td></td>
</tr>
<tr>
<td>Where are potatoes grown in Australia?</td>
<td></td>
</tr>
<tr>
<td>What varieties are available in Australia?</td>
<td></td>
</tr>
<tr>
<td>Potato varieties in Australia – Sequoia, Sebago, Kennebec, Red Pontiac, Exton, Katahdin, Coliban, Toolangi Delight, Russet Burbank, Patrones, Denali, Desiree, Bison, Bintje, Atlantic</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>ACTIVITY 2</strong></th>
<th>Allow students to play the game again. This time focus on the factory and the market and consider the types of potato products that are made and the nutritional value of these.</th>
</tr>
</thead>
<tbody>
<tr>
<td>What products were made from potatoes in the game?</td>
<td></td>
</tr>
<tr>
<td>What preparation techniques would have been used to make these products?</td>
<td></td>
</tr>
<tr>
<td>How did the different preparation techniques of each potato product influence the nutritional value of the potato?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Lesson 3 - 6</strong></th>
<th>Introduce the Hot Potato Design Task and explain the task requirements and expectations.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td>Facilitate and guide students to complete the task. For younger year levels the Jacket Potato recipe included in the game could be used for students to design their own healthy jacket potato recipe.</td>
</tr>
</tbody>
</table>
Links to Other Resources:

Refer to ‘Farm to Fork’- Food Processing and Nutritional Value Learning Task for additional materials on food processing and nutritional value of food.

Some additional resources:
https://www.potatopro.com/australia/potato-statistics Agricultural Statistics Australia
https://www.healthline.com/nutrition/foods/potatoes
https://www.potatopro.com/ Potato pro.com Global potato industry

How to prepare food in healthy ways:

- Fact sheets: https://www.betterhealth.vic.gov.au/healthyliving/healthy-eating,
In pairs, investigate, design, produce and evaluate one healthy potato recipe suitable for adolescents.

**Investigating and defining**
- In pairs, list different types of potatoes
- As a class, discuss these, and identify the most common types in Australia
- What are common characteristics and properties of potatoes?
- In pairs, brainstorm eight different methods of preparing and presenting potatoes, where they are the feature ingredient

**Designing**
- In pairs, students investigate and design three healthy potato recipes suitable for adolescents.
- Select one recipe to prepare, produce and present to the class (take photos to show your product)

**Producing and Implementing**
- In pairs, prepare and produce your potato recipe.
- Present to the class.
- Take a photo of your completed product and upload photo to your booklet or School linked website

**Evaluating**
- Individually evaluate the process you followed, and the product you and your partner produced
- Did your actual product meet the specifications set?

**Collaborating and Managing**
- Review and answer the following – how well did you work with your partner? Meet set deadlines? Timelines for food order and production?

**Extension Task:**
Design and produce a recipe card for your potato meal (including a photo of your actual meal), that could be used in a fruit and vegetable market as a recommended recipe idea for potatoes.
Jacket Potato Recipe

Easy Healthy Recipes Advertisement

AIM: Create a poster that informs customers about healthy, low waste ways to cook and prepare potatoes.

FACTS: 1. Potatoes are a whole food low in fat and salt. 2. Recipes can add variety and taste but vary in nutritional value and amount of waste.

TASK: DRAG & DROP from options in the 2 columns to create your poster.

Drag the most nutritious, tasty and least wasteful jacket potato filling option onto the poster.

SAVE TIME AND EFFORT BY COOKING WITH CONVENIENT PACKET INGREDIENTS.

EATING HEALTHIER IS EASY AND REWARDING.

YOU’LL SATISFY EVERYONE’S TASTES WITH THIS CREAMY, FLAVOURSOME RECIPE.

TRY A SIMPLE, TASTY RECIPE WITH FRESH LOCAL INGREDIENTS.

Choose one statement to support your advertisement.

Basic Jacket Potato
- 2 large baking potatoes
- 1 tsp olive oil
- 1 tbsp filling eg beans, bacon, tomato

Method:
1. Wash the potatoes and prick the skins all over with a fork.
2. Bake at 200°C for 55-60 minutes.
3. Cook, then use the skins all over with the olive oil.
4. Bake for 10-15 mins or until the skins are starting to crisp.
5. Split open and add favourite filling.

Put Recipe Here

EASY HEALTHY RECIPES!

Choose one statement to support your advertisement.

Save time and effort by cooking with convenient packet ingredients.

Eating healthier is easy and rewarding.

You’ll satisfy everyone’s tastes with this creamy, flavoursome recipe.

Try a simple, tasty recipe with fresh local ingredients.

Choose one statement to support your advertisement.

Save time and effort by cooking with convenient packet ingredients.

Eating healthier is easy and rewarding.

You’ll satisfy everyone’s tastes with this creamy, flavoursome recipe.

Try a simple, tasty recipe with fresh local ingredients.

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Save time and effort by cooking with convenient packet ingredients.

Eating healthier is easy and rewarding.

You’ll satisfy everyone’s tastes with this creamy, flavoursome recipe.

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Learning Task Intention:

**At the end of this activity student should be able to:**

- Identify a range of roles humans have in the food supply chain that have an influence on technological change and innovation in agriculture and food production.
- Understand that people use science understanding and skills in their occupations.

Background Information:

Agriculture is not just about working on a farm; there are lots of different kinds of occupations within the food and fibre supply chain. The Department of Agriculture and Food, Western Australia supports the growth of Western Australia’s agrifood sector in four key areas: markets, productivity, profitability and people.

In the game, students come across a range of workers in fields related to Agriculture who successfully produce potatoes and ensure the food supply chain works seamlessly.

Teaching Recommendation:

This learning task focuses on all 4 levels of the game and can be completed across 2-3 lessons in a Science context. Students play ‘Farm to Fork’ game which should take approximately 15min.

After playing ‘Farm to Fork’ game students will identify the role humans play in the production of potato products. Students will be guided to identify the occupations within each stage of the game (1. Production 2. Processing and Distribution 3. Waste Management 4. Marketing, access and consumption).

Then students will research the occupations involved in each stage and identify the science understanding and skills each of these occupations entail.

Students will also explore the role science plays in the development of our food production system over time and how technology has influenced the food supply chain.

Equipment/Materials Required:

- iPad for individual or partner use
- Internet access for student research

Key Words:

Agriculture, food supply chain, occupations, science skills
Lesson Sequence Overview:

<table>
<thead>
<tr>
<th>STUDENT ACTIVITY</th>
<th>TEACHER FOCUS QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson 1</strong></td>
<td></td>
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<tr>
<td><strong>INTRODUCTION</strong></td>
<td></td>
</tr>
<tr>
<td>ACTIVITY 1</td>
<td>What does the word ‘Agriculture’ mean to you? What type of occupations/careers do you know about within the food and agricultural sector?</td>
</tr>
<tr>
<td>Play ‘Farm to Fork’ game.</td>
<td>Facilitate students to play ‘Farm to Fork’ and encourage them to consider the roles humans play in the potato production process.</td>
</tr>
<tr>
<td><strong>ACTIVITY 2</strong></td>
<td>After the game – Ask students did they see a range of roles humans play in the production process?</td>
</tr>
<tr>
<td><em>What Job is That? – Student Activity</em></td>
<td>Distribute – <em>What Job is That?</em> Student Activity</td>
</tr>
<tr>
<td>Student to work though this activity either individually or in small groups.</td>
<td>Guide students to think of the stages in the game, 1. Production 2. Processing and Distribution 3. Waste Management 4. Marketing, access and consumption</td>
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<tr>
<td></td>
<td>What human roles are involved in the production of potatoes in each stage of the game?</td>
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<tr>
<td></td>
<td>What occupations/professions can you identify that are involved in the food production process?</td>
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<td></td>
<td>Guide students to use internet research to assist in identifying agriculture and food careers.</td>
</tr>
<tr>
<td><strong>Lesson 2</strong></td>
<td></td>
</tr>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td>Review the ‘Farm to Fork’ game and the occupations/professions identified last lesson.</td>
</tr>
<tr>
<td>ACTIVITY 3</td>
<td>Guide students to complete the second section of <em>What Job is That?</em> Student Activity by selecting one of the occupations/professions they identified in the game that is of interest to them and research it further.</td>
</tr>
<tr>
<td>Students select one occupation/profession of interest to research. Use internet research and prior knowledge to complete a report on your chosen occupation.</td>
<td>Facilitate student research.</td>
</tr>
<tr>
<td></td>
<td>Each student shares with the class their chosen profession, skills required which match their own interests, and how this career can be achieved, and how this can positively influence Australian Agriculture and the environment for sustainable food production.</td>
</tr>
</tbody>
</table>
Links to Other Resources:

- **Year 7 Refresh.ED** Food and Drink: Source Food in Australia Over Time (Food and Drink Source). Students explore how food production and processing technologies have changed since before European settlement to now and what influence this has had on food availability and cooking methods. Download from the Refresh.ED website [http://www.refreshedschools.health.wa.gov.au/](http://www.refreshedschools.health.wa.gov.au/)

Occupations/professions in Agriculture:
[https://myfuture.edu.au/](https://myfuture.edu.au/)
What Job is That?

Student Activity

Section 1:

1. In the game ‘Farm to Fork’ there are 4 main stages involved in the production of the potato products. Recall the four (4) stages and list each of these as a title in the boxes below.

<table>
<thead>
<tr>
<th>Stage 1:</th>
<th>Stage 2:</th>
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<table>
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<th>Stage 3:</th>
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</table>

2. Throughout the game people play important roles in each stage of the game/potato production process. Some of these people you might have physically seen as characters in the game others might be jobs/roles you know go on in the background of the game. Discuss this with your partner. Remember to consider the following growing, research, making, managing, changing, trading, marketing, and selling

3. Use the internet to research occupations/professions within the agriculture and food industry and identify the occupations/professions that would be involved in the potato production process. Useful websites could be:
   https://myfuture.edu.au/

List the occupations/professions you identify:
Section 2:

1. Select one occupation/profession within the agriculture and food industry that is of interest to you and research it in more detail.

   a. What is the occupation/profession?
   b. What skills, attributes and knowledge are required for this profession?
   c. What study/training is required for this profession?
   d. What science understandings or skills are required for this occupation?
   e. How can a career in this occupation make a positive impact to Australian agriculture and the environment for sustainable food production?
   f. How does this occupation influence technological change and innovation in agriculture and food production?

2. Prepare a report on this occupation to present back to your peers.
This section provides links to additional content to inform teaching activities related to the four levels of the ‘Farm to Fork’ game: 1. Production, 2. Processing and Distribution, 3. Waste Management 4. Marketing, Access and Consumption.

1. PRODUCTION

The Food and Agriculture Organisation of the United Nations
International Year of the Potato expands understanding of the potato’s role in agriculture, economy and global food security. A collection of factsheets on key issues in potato development, including cultivation nutrition, biodiversity and economy.


International Potato Centre
Potato crop origin, facts and figures, nutrition, varieties and utilisation.

http://www.CIPotato.org

Potatoes South Australia
A national and global snapshot of the potato, imports/ export figures, harvesting periods.

https://www.pota
tootessa.com.au/industry.html

Discovery Agriculture – Potato Farming | How to Grow Potatoes YouTube clip
Useful potato farming in Australia educational video for students https://youtu.be/FBfuyRL5XaA

The Department of Agriculture and Food
Conditions for growing potatoes, managing temperature and soil temperatures in potatoes to improve quality


WA Potatoes
Growing regions of potatoes in Western Australia.


Fresh For Kids | Potato
Growing regions of potatoes in Australia, seasonal availability of potatoes.

The Department of Agriculture and Food - Local Food Map Produce

Map of local food trail through Western Australia.


Career Harvest | Careers in Agriculture

An agriculture job is any position that is involved with the production of food, feed or fibre at some level. Career Harvest provides an overview of agricultural industries and the variety of career opportunities available in agriculture and agribusiness.

https://www.careerharvest.com.au

The Department of Agriculture and Food | Careers in Food and Fibre

Western Australia’s agrifood sector four key areas of growth: markets, productivity, profitability and people. Career opportunities that exist in the food and fibre supply chain, such as producing crops and farming animals, manufacturing and processing, marketing, trade and media.


2. PROCESSING AND DISTRIBUTION

Processing Potato Production Snapshot

The Australian processing potato industry including On-farm production; Processing such as French fry related products, fresh potato and potato snacks/ crisps, and Market: frozen food service and retail, exports and crisping retail.


Potato Agri-Food Systems Program

The International Potato Centre response to agricultural development challenges and the need for more nutritious and resilient food crops in developing countries.

https://cipotato.org/programs/potato-agri-food-systems-program/

FOODmap: An analysis of the Australian food supply chain

FOODmap is a comprehensive analysis of food distribution channels for major categories within the Australian food industry from producer to consumer.


SBS Australia | Food Miles

Food Miles is the idea that food shipped or flown internationally produces greater CO2 emissions than locally produced food. SBS Australia article considering the arguments for and against ‘food miles’.

3. WASTE MANAGEMENT

**OZHarvest Food Waste Infographic**

In Australia, food waste is estimated to cost the economy $20 billion per year. OZHarvest is a leading food rescue organisation in Australia, picking up excess food from commercial outlets and delivering to charities supporting those in need. Four pillars of OZHarvest to prevent waste, eliminate hunger, and educate people are: Rescue, Educate, Engage, Innovate. Infographic addresses the global issue of food waste and provides tips for eliminating food waste at home/ at school.

https://www.ozharvest.org/fight-food-waste/foodwasteinfographic/

**FOODWISE Household Food Waste**

Infographic addresses household food waste in Australia.


**Transforming Potato Food Waste**

Australian large potato producers investing in research and development to convert 100% of potato waste, approximately 100,000 tonnes, for commercial benefit and sustainability.


**National Food Waste Strategy: Halving Australia’s Food Waste by 2030**

Food waste is a global challenge with substantial environmental, social and economic impacts. This strategy outlines initiatives to manage the problem of food waste in Australia.


4. MARKETING, ACCESS AND CONSUMPTION

**Food Standards Australia New Zealand – Australian Food Composition Database | Potatoes**

Search by name for description and nutrient content of potato or potato product. For example raw food (potatoes peeled/ unpeeled), dishes (boiled, baked, fried) and snack foods (crisps, French fries)


**Techniques for cooking potatoes**

Potatoes are the foundation ingredient for many different meals and cuisines. A detailed guide of tips for storing, peeling and the different techniques for cooking potatoes. Including how to make mashed potatoes, roast potatoes, jacket potatoes, boiled and fried potatoes.

https://www.lovepotatoes.co.uk/hints-and-tips/
Beta Spuds Recipes
A variety of nutritious and tasty recipes and ways to cook potatoes.

WA Potato Consumption
Production and consumption of potatoes globally compared to Western Australia. Potato consumer market in WA; factors that influence the purchase decision of fresh potatoes.

Potato Nutrition

Visual Literacy – Marketing for Health