



Food & Drink
SOURCE

YEAR 10

Sustainable Food Systems

Introduction

In this unit, students are to critically analyse how their food choices influence the physical environment. Students are introduced to the concept of sustainability, what it means and what they can do to contribute towards a more sustainable food system for the future. Seven practices of food sustainability become the core of this unit and are the underpinning criteria for students to design and create a healthy fast food meal deal.

Key Message

- Political, economic and societal complexities influence healthy food production, supply and demand in Australia and around the globe.

This unit will enable students to:

- Explore and analyse historical, cultural, social, political, economic, technological and environmental factors that impact on food services, food production and consumption pattern



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Links to the Western Australian Curriculum

| Main learning area: DESIGN AND TECHNOLOGIES* | | |
|--|----------------------------|---|
| Strands | Sub-strand/contexts | Content descriptions |
| Knowledge and understanding | Technologies and society | Social, ethical and sustainability considerations that impact on designed solutions, complexity of design, and production processes involved. Impact of emerging technologies on design decisions, and/or economic, environmental and social sustainability. |
| | Food and fibre production | The role of emerging research and technology in the design of ethical and sustainable products. |
| | Food specialisations | Healthy eating through the skills and knowledge of nutrients and the application of the principles of food safety, preservation, presentation and sensory perceptions. |
| Processes and production skills | Designing | Apply design thinking, creativity, enterprise skills and innovation to develop, modify and communicate design ideas of increasing sophistication. Design possible solutions, analysing designs against criteria, including functionality, accessibility, usability and aesthetics, using appropriate technical terms and technology. |
| | Producing and implementing | Safely select, justify, implement and test appropriate technologies and processes, to make solutions. |

*Based on Western Australian Curriculum Design and Technologies.

| | | | |
|------------------|---------------------------------------|------------------------------|--|
| Geography | Knowledge and understanding | Geography | Environmental change and management |
| | | | The human-induced environmental changes that challenge sustainability (e.g. water and atmospheric pollution, degradation of land, inland and coastal aquatic environments) |
| | | | The environmental worldviews of people and their implications for environmental management |
| | | | The strategies to manage the environmental change being investigated |
| | Humanities and Social Sciences skills | Questioning and researching | Construct, select and evaluate a range of questions and hypotheses involving cause and effect, patterns and trends, and different perspectives |
| | | | Analyse and clarify the purpose of an inquiry using appropriate methodologies, ethical protocols and concepts to plan for, and inform, an investigation |
| | | | Use a range of methods to collect, select, record and organise relevant and reliable information and/or data from multiple sources that reflects the type of analysis of information that is needed (e.g. questionnaires, surveys, emails, discussion lists, tables, field sketches, annotated diagrams), with and without the use of digital and spatial technologies |
| | | | Identify the origin, purpose and context of primary sources and/or secondary sources |
| | | Communicating and reflecting | Select a range of appropriate formats based on their effectiveness to suit audience and purpose, using relevant digital technologies as appropriate |
| | | | Develop texts, particularly explanations and discussions, using evidence from a range of sources to support conclusions and/or arguments |
| | | | Deconstruct and reconstruct the collected information and/or data into a form that identifies the relationship between the information and the hypothesis, using subject-specific conventions, terminology and concepts |
| | | | Reflect on why all findings are tentative (e.g. the changing nature of knowledge, changes in circumstances, changes in values) |

Links to the Australian Curriculum

| Main learning area: DESIGN AND TECHNOLOGY* | |
|--|--|
| Strands | Content descriptions |
| Knowledge and understanding | <p>Critically analyse factors, including social, ethical and sustainability considerations, that impact on designed solutions for global preferred futures and the complex design and production processes involved. (ACTDEK040)</p> <p>Explain how products, services and environments evolve with consideration of preferred futures and the impact of emerging technologies on design decisions. (ACTDEK041)</p> <p>Investigate and make judgments on the ethical and sustainable production and marketing of food and fibre. (ACTDEK044)</p> |
| Processes and production skills | <p>Critique needs or opportunities to develop design briefs and investigate and select an increasingly sophisticated range of materials, systems, components, tools and equipment to develop design ideas. (ACTDEP048)</p> <p>Apply design thinking, creativity, innovation and enterprise skills to develop, modify and communicate design ideas of increasing sophistication. (ACTDEP049)</p> <p>Work flexibly to safely test, select, justify and use appropriate technologies and processes to make designed solutions. (ACTDEP050)</p> |

*Based on Australian Curriculum Design and Technology.

Additional links to the Australian Curriculum

| Additional learning areas | Strands | Sub-strands/contexts | Content description code |
|--------------------------------------|--|--|---|
| Health and Physical Education | Personal, social and community health | Communicating and interacting for health and wellbeing | (ACPPS093) (ACPPS095) |
| | | Contribution to healthy and active communities | (ACPPS096) (ACPPS097) |
| Geography | Geographical knowledge and understanding | Environmental change and management | (ACHGK070) (ACHGK071) (ACHGK074) |
| | | Geographical Inquiry and Skills | (ACHGS072) |
| | | Observing, questioning and planning | (ACHGS072) |
| | | Collecting, recording, evaluating and representing | (ACHGS073) |
| | | Communicating | (ACHGS079) |
| | | Reflecting and responding | (ACHGS080) |

General capabilities

The Australian Curriculum describes seven general capabilities which extend across each learning area. Their relevance to learning tasks in this unit is indicated below:

| Learning Task | Literacy | Numeracy | ICT capability | Critical and creative thinking | Ethical understanding | Personal and social capability | Intercultural understanding |
|---|----------|----------|----------------|--------------------------------|-----------------------|--------------------------------|-----------------------------|
| Does what you eat environmentally matter? | | | | | | | |
| Towards a sustainable food system | | | | | | | |
| Making a healthy meal deal | | | | | | | |
| Spreading the word on sustainability | | | | | | | |

Unit Overview

Most learning tasks require prior preparation; therefore refer to Resources needed list below before commencing each learning task.

| Learning Task | Suggested time allocation | Resources needed |
|--|--|--|
| Introducing Key Messages | | |
| <p>1. Does what you eat matter environmentally?</p> <p>This learning task introduces students to the concept of food systems and their impact on the environment.</p> | <p>45 minutes THEORY</p> | <ul style="list-style-type: none"> • Internet access |
| Developing Key Messages | | |
| <p>2. Towards a sustainable food system</p> <p>This learning task explores the concept of sustainability and sustainable food.</p> | <p>45 minutes THEORY</p> | <ul style="list-style-type: none"> • <i>Sustainability</i> Activity Sheet A and B – 1 per group • Internet access, publisher or power point • Concrete materials 4kg in weight to represent the average person's food wastage/week. |
| <p>3. Making a sustainable meal deal</p> <p>In this learning task, students investigate, design and produce a healthy fast food meal deal that takes into account the seven sustainability practices addressed in the unit.</p> | <p>PART A: 45 mins THEORY</p> <p>PART B: 45 mins PRACTICAL</p> | <ul style="list-style-type: none"> • <i>Making a meal deal</i> Activity sheet – 1 per group • Internet access, publisher or power point • Ingredients for selected beverages and meals to be made • <i>Chickpea burgers with Apple, pear and spinach juice</i> recipe (optional) • Cooking utensils and equipment |
| Reflecting Key Messages | | |
| <p>4. Spreading the word on sustainability</p> <p>As a reflection activity, students design a print media campaign to promote one of seven key practices for a sustainable food system.</p> | <p>45 minutes THEORY</p> | <ul style="list-style-type: none"> • Factsheets for Learning Task One • Paper and drawing materials (optional) • Computer access (optional) |

Teacher Information

Some learning tasks require food preparation and cooking. Before commencing:

- Check students do not have allergies or sensitivities to foods used.
- Ensure included food and drinks are culturally acceptable.
- Refer to food and drinks from other cultures in relevant class discussions.
- Discuss food hygiene and safety practices, for example, always wash your hands before touching food and do not use sharp knives without adult supervision.

| Learning Task | Useful information and resources to deliver this Learning Task |
|---|--|
| 1. Does what you eat matter environmentally? | <ul style="list-style-type: none"> • This learning task introduces students to the concept of food systems and their impact on the environment. • Australia's current industrialised food systems contribute to high crop yields; high commodity production and a large number of highly processed and packaged foods. Consequently, our food industry is high profitable and consumers are faced with a plethora of food choices at cheap, competitive prices. • However, the use of modern technologies within our current food system also has critical environmental impacts that include; <ul style="list-style-type: none"> ○ Polluted soil ○ Polluted air ○ Polluted water ○ A loss of biodiversity ○ An increase in food waste and landfill • The Foodprint Melbourne project run by the University of Melbourne presents evidence on greenhouse gasses and waste generated http://research.unimelb.edu.au/foodprint-melbourne |
| 2. Towards a sustainable food system | <ul style="list-style-type: none"> • This learning task explores the concept of sustainability and sustainable food. • Sustainable foods are produced, processed, bought, sold and eaten in ways that: <ul style="list-style-type: none"> ○ Provide social benefits such as safe and nutritious products and improve people's experiences of good quality food, for instance by growing and cooking it. This helps to enrich our knowledge and skills and our cultural diversity. ○ Contribute to thriving local economies that create employment and secure livelihoods. ○ Enhance the health and variety of both plants and animals, protect natural resources and help to prevent climate change. • Seven Key practices needed to help achieve a more sustainable food system, developed by <i>Sustain</i>, A United Kingdom group which advocates for sustainable food systems, is introduced. Register (free) for a copy of <i>The Sustain Guide to Good Food</i> at http://www.sustainweb.org/. Find other useful information and ideas at; <i>Sustainability Victoria</i> http://www.sustainability.vic.gov.au and <i>The Sustainable Table</i> https://sustainabletable.org.au/. |
| 3. Making a sustainable meal deal | <ul style="list-style-type: none"> • In this learning task, students are to investigate, design and produce a healthy fast food meal deal that takes into account the previously learnt seven sustainability practices. • Refer to the <i>Food hygiene and safety practices</i> Teacher information sheet for further information |
| 4. Spreading the word on sustainability | <ul style="list-style-type: none"> • No additional information required |

Introducing Key Messages

Learning Task One: *Does what you eat matter environmentally?*

THEORY

1. Explain this unit focuses on food systems, their environmental impacts and sustainability.

Ask:

- *Do you think your food choices have an impact on our environment? If so, in what way?*

2. Discuss and record student responses. Students record in their workbook.
3. Watch the following video by Michael Pollan (15:19), a passionate advocate for sustainable food: <http://vimeo.com/7528069>

Ask:

- *Even though this video is in an America context, do you think it is still relevant to Australia?*
- *What did this video convey about our current highly industrialised food system?*

4. Explain the positive and negative consequences of modern technology our current food system. See teacher information (Page 6) for further detail.

Ask:

- *What were some of the recommendations made by Michael Pollan in the video for changing this industrialised system?*

Some of the suggestions may be:

- New policies and incentives for farmers
- Encourage local food economies to form
- Change our own behaviours e.g. eat 'real' foods, shop at farmers' markets
- Eat 'real' food. Not too much. Mostly plants
- Plant a vegetable garden
- Cook more
- Eat and enjoy meals with others rather than in front of the TV or 'on the run'

5. Explain research from the Foodprints Melbourne project estimated the average Australian produces 200kg of food waste per year, which equates to 4 kg/week. Model this amount using common food items.
6. Use the online *Food waste and Greenhouse Gas Calculator* <https://watchmywaste.com.au/food-waste-greenhouse-gas-calculator/> to calculate varying amounts of food waste and how this equates to electricity and fuel consumption. Discuss findings as a class.

Developing Key Messages

Learning Task Two: *Towards a sustainable food system*

THEORY

1. Explain in response to the current industrialised food system and its negative environmental impacts, communities have initiated alternative, sustainable food and agricultural systems.
2. Define what we mean by sustainable food. See teacher information section for further detail.
3. Explain that Sustainable Table, An Australian based Not-for-Profit, advocates for sustainable food systems has identified ten key practices needed to help achieve a more sustainable food system.
4. Introduce these seven practices using the *Sustainability Activity* sheet
5. Split the class into groups.
6. Allocate one to two of these seven practices to a group.
7. Using the internet, each group is to research their allocated practice/s and answer the following research questions.
 - Why is this practice needed? (i.e. explain the problem addressed and its impact on health and the environment)
 - What can we do as individuals to fulfil this practice?
 - What can we do as a school to fulfil this practice?
 - What can we do Australia wide to fulfil this practice?
8. Research findings can be recorded on the *Towards a sustainable food system Activity* sheet.
9. Using a computer program such as Microsoft publisher, each group is to present their research findings on an A4 page fact sheet. If class time does not permit, this can be set as a homework task.
10. Photocopy each group's fact sheet and distribute to the class.
11. Each student should end up with at least seven fact sheets, summarising each of the ten practices.

Learning Task Three: *Making a healthy meal deal*

PART A: THEORY

1. Place students into groups of four.
2. In their groups, students are to investigate, design and produce a healthy fast food meal deal that takes into account the previously learnt 7 sustainability practices. This healthy fast food meal deal is to consist of a beverage and a lunch/dinner meal item.
3. Distribute a copy of the *Making a healthy meal deal* Activity sheet to each group.
4. As group, students are to complete Part A of the Activity sheet.
5. Students will also be required to describe and design packaging they would use for their healthy meal deal, using computing technology and skills if available.
6. As a class, constructively discuss each group's proposed healthy meal deal in terms of criteria in Part A.
7. Each group is then to complete Part B of the *Making a meal deal* Activity sheet.
8. Encourage students to use the internet to identify and modify recipes, online grocery stores to calculate ingredient costs and sustainability sites to determine environmental costs.
9. The *Chickpea burgers* and *Apple, pear & spinach juice* recipes can be used if students are struggling to identify a suitable recipe or used as an exemplar.

PART B: PRACTICAL

10. Split each group from PART A into pairs.
11. Explain one pair is to prepare the beverage selected in their healthy meal deal design and one pair is to prepare the meal item.
12. Remind students to practice the Four C's (clean, cook, chill, cover) of food safety whilst preparing their recipe.
13. Once each healthy meal deal has been prepared, have students display them on a shared classroom bench or at their workstation along with description or illustration of their proposed packaging on the *Making a meal deal* Activity sheet.
14. Allow groups to review one another's work.
15. Sit down as a class and share the healthy meal deals made. If possible, encourage taste testing of each group's meal.
16. Discuss which group the class thinks met the project requirements the best and why.

Reflecting on Key Messages

Learning Task Four: *Spreading the word on sustainability*

THEORY

1. Using the factsheets created in learning task one, each student is to select one of the seven key practices needed to help achieve a more sustainable food system.
2. Students may choose the same practice they investigated in learning task one, or they may choose another one.
3. Using knowledge gained about their selected practice, students to design a print advertising campaign to promote community awareness about their sustainability practice.
4. Students must consider:
 - Intended target audience
 - Artwork
 - Text
 - Where the viewer can gain more information if interested.
5. Please note, the key focus of this learning task is for students to *design* their advertisement. Development of the actual print advertisement can be set as homework, or completed in class if time permits.
6. If time, facilities and skills permit, encourage students to design this print advertisement using computer technology. Alternatively students can draw their print advertisement.
7. Each student is to provide a brief description of their final print advertisement to the class.

Additional activities

Classroom

- Brainstorm ways the school could be more food sustainable. Develop and conduct a survey with other students in the school on actions they would happily take to contribute to the school being more food sustainable.
- Pick a common unhealthy fast food meal and track its production process and the impact it would have on the environment in terms of greenhouse gas emissions, fossil fuels etc.

Whole school

- Review your canteen menu and determine how more sustainable foods could be incorporated.
- Adopt the Health Promoting Schools Framework for example, engage with parents and school community to develop and implement school food and nutrition guidelines and teaching programs across all year levels. See <http://www.wahpsa.org.au/> or email info@wahpsa.org.au.

Sustainability Activity Sheet A

Aiming to be waste free

Reducing food waste saves energy, effort and natural resources used to produce & dispose of it. It also helps save money.

Eating less meat and dairy produce

Eating more vegetables, fruit and grains and less animal products helps reduce health risks and greenhouse gases.

Buying local, seasonal and environmentally friendly food

This benefits wildlife and the countryside, minimises the energy used in food production, transport and storage and helps protect the local economy.

Choosing fair trade-certified products

This scheme for food and drinks imported from poorer countries ensures a fair deal for disadvantaged producers.

Selecting fish only from sustainable sources

Future generations will be able to eat fish & seafood if we act now to protect our rivers and seas.

Getting the right balance

We need to cut down on sugar, salt and fat, and most of us want to avoid questionable ingredients and processes such as genetic modification and some additives.

Growing our own and buying the rest from a wide range of outlets.

Sustainability Activity Sheet B

Allocated practice:

| | |
|--|--|
| <p>1. Why is this practice needed? (i.e. what problem does it address including the impact it is having on health and the environment?)</p> | |
| <p>2. What can we do as individuals to fulfil this practice?</p> | |
| <p>3. What can we do as a school to fulfil this practice?</p> | |
| <p>4. What can we do Australia wide to fulfil this practice?</p> | |

Making a healthy meal deal Activity sheet

For this project, your group is required to design and create a healthy fast food meal deal consisting of 1 beverage and 1 meal item (lunch or dinner). In designing this meal deal you will need to consider the following questions.

PART A

1. Who is your target audience? (i.e. young children, teenagers, adults, parents)

2. Describe how you could take into consideration the 7 food sustainability practices in the design of your healthy fast food meal deal

| Seven (7) practices | What does this mean for the design of your healthy fast food meal deal? |
|--|---|
| <p>Aiming to be waste free Reducing food waste saves energy, effort and natural resources used to produce & dispose of it. It also helps save money.</p> | |
| <p>Eat better, and less meat and dairy produce. Eating more vegetables, fruit and grains and less animal products helps reduce health risks and greenhouse gasses.</p> | |
| <p>Buying local, seasonal and environmentally friendly food. This benefits wildlife and the countryside, minimised the energy used in food production, transport and storage and helps protect the local economy.</p> | |
| <p>Choosing Fair trade-certified products This scheme for food and drinks imported from poorer countries ensures a fair deal for disadvantaged producers.</p> | |
| <p>Selecting fish only from sustainable sources Future generations will be able to eat fish & seafood if we act now to protect our rivers and seas.</p> | |
| <p>Selecting fish only from sustainable sources Future generations will be able to eat fish & seafood if we act now to protect our rivers and seas.</p> | |
| <p>Getting the balance right We need to cut down on sugar, salt and fat, and most of us want to avoid questionable ingredients and processes such as genetic modification and some additives.</p> | |
| <p>Growing our own and buying the rest from a wide range of outlets.</p> | |

Making a healthy meal deal Activity sheet

3. After considering these 7 practices and what they mean in terms of designing a healthy fast food meal deal, what type of beverage will your group create? Include a list of ingredients and a brief description and/or an illustration of the ideal packaging.

| Ingredients | Description/Illustration of packaging |
|-------------|---------------------------------------|
| | |

Making a healthy meal deal Activity sheet

4. After considering these 7 practices and what they mean in terms of designing a healthy fast food meal deal, what type of meal item will your group create? Include a list of ingredients and a brief description and/or an illustration of the ideal packaging.

| Ingredients | Description/Illustration of packaging |
|-------------|---------------------------------------|
| | |

Making a healthy meal deal Activity sheet

PART B

Now that your group has decided on a healthy meal deal which you wish to create, a recipe and food order sheet need to be written up. The recipe and food order need to be completed to be able to make 2 healthy meal deals.

Recipe Name

Preparation time:

Cooking time:

Servings:

Estimated cost per serving:

Ingredients

Method

Making a healthy meal deal Activity sheet

Recipe Name

Preparation time:

Cooking time:

Servings:

Estimated cost per serving:

Ingredients

Method

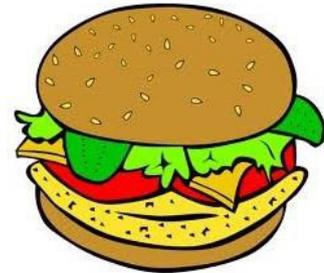
Chickpea Burgers

Preparation time: 20 minutes ♦ **Cooking time:** 30 minutes ♦ **Servings:** 6 - 8

Ingredients

Patties:

- 2 large potatoes, unpeeled, cut in quarters
- 500g (3 cups) drained canned chickpeas
- 1 egg, lightly whisked
- 10-12 green shallots, finely sliced
- 1 /2 cup fresh mint leaves
- 60mls (1/4 cup) fresh lemon juice
- 3/4 cup wholemeal breadcrumbs
- Ground black pepper, to taste
- 1 tablespoon olive oil



Sauce:

- 2 tablespoons tahini
- 140g (1/2 cup) natural low-fat yoghurt

Toppings:

- 6 wholemeal bread rolls
- Lettuce leaves
- 2 medium ripe tomatoes, sliced

Method

1. Place potatoes in a saucepan and add enough water to cover. Bring to the boil and cook for 20 minutes or until tender.
2. Drain and stand until cool enough to handle.
3. Peel and then mash with a potato masher or fork.
4. Place chickpeas in the bowl of a food processor and process until coarsely chopped. Transfer to a large bowl.
5. Add the mashed potato, egg, green shallots, mint, 2 tablespoons of the lemon juice, breadcrumbs and pepper to taste and mix with your hands until combined.
6. Shape evenly into 6 patties.
7. Heat the olive oil in a large non-stick frying pan over medium heat.
8. Add the patties and cook for 10 minutes each side or until golden and heated through.
9. Meanwhile, preheat grill on high. Combine tahini, yoghurt and remaining lemon juice.
10. Split and toast the buns under preheated grill.
11. Top the bun bases with the lettuce, tomatoes and patties followed by a dollop of the tahini mixture.
12. Cover with the bun tops and serve.

Apple, Pear & Spinach Juice

Preparation time: 10 minutes ♦ **Cooking time:** Nil ♦ **Servings:** 4

Ingredients

- 3 large pears, quartered
- 3 large granny smith apples, quartered
- 100g baby spinach
- 5 fresh mint sprigs
- Ice cubes and mint sprigs, to serve

Method

1. Place a large jug under juice extractor nozzle.
2. Juice pear, apple, spinach and mint.
3. Stir to combine.
4. Divide ice cubes between chilled glasses.
5. Top with pear juice mixture.
6. Serve with mint.

