Sample teaching planner –   
Food and fibre production

Design and Technologies

Levels 7–10

**Disclaimer:** It is the responsibility of the school to ensure that duty of care is exercised in relation to the health and safety of all students undertaking any activities suggested in this teaching planner.

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Introduction

The Technologies Contexts sub-strand Food and fibre production in the Victorian Curriculum F–10 Design and Technologies focuses on food and fibre as human-produced or harvested resources, and how food and fibre are produced in managed environments such as farms or plantations, or harvested from wild stocks. Students develop an understanding of the challenges involved in managing these resources within sustainable agricultural systems. They develop their knowledge and understanding about the managed systems that produce food and fibre through creating designed solutions.

This teaching planner identifies themes, key messages and ideas for teaching content from specific content descriptions of Food and fibre production Levels 7 to 10. The information in the teaching planner has been provided to assist teachers to design and plan teaching and learning programs that are suitable for their own cohort of students. The ideas for teaching curriculum content are not intended to comprise a sequence of learning but rather they are ideas to support teachers to plan suitable lessons.

Please note, teachers are advised to use their professional judgment to ensure lesson plans comprehensively address the relevant content descriptions.

Online resources for Food and fibre production

To complement the sample teaching planner, a suite of online resources has been curated and published on FUSE’s [Food and fibre production page](https://fuse.education.vic.gov.au/pages/foodandfibre). The resources are categorised according to the four themes identified in this sample teaching planner and support the teaching of content in the Technologies Contexts sub-strand Food and fibre production in Victorian Curriculum F–10 Design and Technologies.

Hyperlinks to relevant FUSE resources, plus other online resources, are included within the ‘Ideas for the classroom’ sections in this teaching planner.

Key theme 1: Growing animals

The ‘Ideas for the classroom’ in this theme promote skills, knowledge and understanding of concepts related to investigating animals that are grown for food and clothing, including animal welfare, growth and nutrition.

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|  | **Levels 7 and 8** | **Levels 9 and 10** |
| **Key messages** | * How animals are grown impacts on the quality of the end products. * The ways animals are raised for food and fibre have ethical and profit considerations. | * We can investigate and make judgments on how animals are raised and managed locally and globally. * The practical aspects of managing animals in agricultural systems include animal welfare, growth, nutrition and reproduction. |
| **Ideas for the classroom** | * Investigate different animal feeding strategies, such as grazing and supplementary feeding, and their effects on product quality when producing food and fibre products, for example meat tenderness, wool fibre diameter (micron), and milk fat and protein content. * Practise and communicate techniques to improve expertise in handling animals and making animals saleable, for example make an instructional video or infographic about raising chickens at the school. * Investigate and explain animal reproduction. * Take part in a virtual or real farm visit to explore features of the cattle, sheep or goat industries. Discuss any features of the farm that address issues related to sustainability. * Research farming in Australia and produce a class Google Map, using the [Google My Maps](https://www.google.com/maps/about/mymaps/) feature, showing the main agricultural areas. Add pins with information about each of the different agricultural industries, including sustainability considerations. * Investigate how ethical slaughter practices have animal welfare in mind, but also affect the taste of the meat. | * List key animal welfare considerations in food and fibre production and choose one enterprise to investigate further. Consider how ethics, social values and sustainability considerations, including profitability, impact on animal welfare. Present findings in a short written report, video or podcast. * Undertake a case study analysis that explores the use of selective breeding or the use of reproductive technologies. * Create a comparative visual presentation of dairy farming in Australia versus dairy farming in a Middle Eastern country, such as Saudi Arabia, exploring how the animals are raised and managed. * Explain safe working practices required for working with animals. In groups, students develop a short online quiz to test with other groups. Review school practices and consider if there are actions that can improve safety and animal welfare. * Identify key nutrients for animal growth and explain their functions. * Predict the impact of emerging technologies for preferred futures in agriculture or horticulture, for example growing and eating insects or development of laboratory-raised meat such as that in the Impossible Burger. Discuss how these new foods might be marketed to consumers. |
| **Content descriptions** | * Analyse how food and fibre are produced when creating managed environments and how these can become more sustainable [(VCDSTC046)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC046) * Effectively and safely use a broad range of materials, components, tools, equipment and techniques to produce designed solutions [(VCDSCD051)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD051) | * 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 [(VCDSTS054)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTS054) * Investigate and make judgements on the ethical and sustainable production and marketing of food and fibre [(VCDSTC057)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC057) * Work flexibly to safely test, select, justify and use appropriate technologies and processes to make designed solutions [(VCDSCD062)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD062) |

Key theme 2: Growing plants

The ‘Ideas for the classroom’ in this theme promote skills, knowledge and understanding of concepts related to investigating plants that are grown for food, clothing and shelter, including plant nutrition and growth.

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|  | **Levels 7 and 8** | **Levels 9 and 10** |
| **Key messages** | * How plants are grown impacts on the quality of the end products. * The ways plants are grown for food, fibre and shelter have ethical and profitable considerations. | * We can investigate and make judgments on how plants are grown and managed locally and globally. * The practical aspects of managing plants in horticultural systems include growth, nutrition and reproduction. |
| **Ideas for the classroom** | * Compare the management of plant growth using organic farming practices with management using non-organic farming practices such as the use of chemical products like herbicides. * Investigate the physical and chemical characteristics of soil, such as pH, phosphorous, nitrogen and potassium levels, and their effects on plant growth. * Examine, test and evaluate the differences between natural hardwood and plantation softwood timbers, and make judgments on their durability for internal and external uses. * Investigate how the use of fertilisers and irrigation can improve growth and profit for a farmer on select plants such as eucalyptus, barley and cotton. * Explore different types of irrigation and identify types that will best meet future needs. Develop a design brief to build a system to irrigate the school garden. * Research farming in Australia and produce a class Google Map, using the [Google My Maps](https://www.google.com/maps/about/mymaps/) feature, showing the main horticultural areas. Add pins with information about each of the industries, including sustainability considerations. | * Visit a farm or interview a person working in horticulture. Develop a video or photo story outlining the key processes, inputs and outputs. * Investigate the interdependence of plants and animals in food and fibre production. * Compare different growing media that plants can thrive in, such as the media in hydroponics, aeroponics, mistponics and aquaponics, and discuss how plants can obtain nutrients in these environments. * Create an infographic or flow chart showing the components of a horticultural system and how they interact. Students can compare an Australian cropping system to one used in another country or region. * Investigate plant breeding by scientists and farmers and the desired traits that are bred. * Explore production processes to respond to unforeseen challenges or opportunities, for example lower than average rainfall and its impacts on the growth of plants. Investigate the impact of lower than average water on soil quality, plant nutrition and growth. * Research plant-based products that are being used for meat alternatives, and map the processes used in product development. |
| **Content descriptions** | * Analyse how food and fibre are produced when creating managed environments and how these can become more sustainable [(VCDSTC046)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC046) * Effectively and safely use a broad range of materials, components, tools, equipment and techniques to produce designed solutions [(VCDSCD051)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD051) * Independently develop criteria for success to evaluate design ideas, processes and solutions and their sustainability [(VCDSCD052)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD052) | * Explain how designed solutions evolve with consideration of preferred futures and the impact of emerging technologies on design decisions [(VCDSTS055)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTS055) * Investigate and make judgements on the ethical and sustainable production and marketing of food and fibre [(VCDSTC057)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC057) * Work flexibly to safely test, select, justify and use appropriate technologies and processes to make designed solutions [(VCDSCD062)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD062) |

Key theme 3: Industries and managed systems

The ‘Ideas for the classroom’ in this theme promote skills, knowledge and understanding of concepts related to food and fibre production industries, everyday innovations and technological innovations, and traditional land management practices.

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|  | **Levels 7 and 8** | **Levels 9 and 10** |
| **Key messages** | * Modern and traditional land management practices that are used to improve the quality of food and fibre production can be local or global. * Food and fibre industries are vital for economic prosperity in Australia. | * The ways that food and fibre are produced have impacts on food security for local, national, regional and global communities. * Food and fibre industries provide a range of employment and career pathways. |
| **Ideas for the classroom** | * Investigate the importance of food and fibre production to Australia’s food security and economy, including the importance of exports and imports. * Explore Australia’s connections to countries in Asia and the Middle East through an investigation of Australia’s wheat exports. Develop a Google map showing where most of Australia’s wheat is exported to. * Compare land and water management methods in contemporary Australian food and fibre production with traditional Aboriginal systems and systems from Asian countries, for example minimum-tillage cropping and water-efficient irrigation. * Explore how cotton farming has changed over time in Australia and identify both new innovations and traditional methods that are being used. Analyse community and sustainability considerations for growing cotton. * Explore new technologies in the dairy industry and discuss why Australian dairy farms are the most innovative in the world. * Research how Aboriginal peoples used fire for farming and to manage land. | * Use a class collaborative space to develop a report on the range of industries and occupations available in agriculture and horticulture, including the changing nature of professional roles and careers. * Explore resources and reports in the [FoodPrint Melbourne](https://fuse.education.vic.gov.au/ResourcePackage/ByPin?pin=WMGDK2) project. Access the online Geographic Information System (GIS) mapping tool to map Melbourne’s food bowl and investigate factors that contribute to food reliability in Melbourne. Identify what we can do to protect our fresh food supply as Melbourne grows. Use these findings to make predictions about how to feed our growing global population. * Examine emerging production technologies and methods – for example vertical farming, and recirculation technologies in aquaculture – in terms of productivity (including profitability) and sustainability. * Investigate how digital technologies could be used to enhance food production systems, for example global positioning system (GPS) for managing animals, crop sensors, automated animal feeding systems or robotic dairies. |
| **Content descriptions** | * Examine and prioritise competing factors including social, ethical, economic and sustainability considerations in the development of technologies and designed solutions to meet community needs for preferred futures [(VCDSTS043)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTS043) * Investigate the ways in which designed solutions evolve locally, nationally, regionally and globally through the creativity, innovation and enterprise of individuals and groups [(VCDSTS044)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTS044) | * Investigate and make judgements on the ethical and sustainable production and marketing of food and fibre [(VCDSTC057)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC057) * Evaluate design ideas, processes and solutions against comprehensive criteria for success recognising the need for sustainability [(VCDSCD063)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD063) |

Key theme 4: Sustainable futures

The ‘Ideas for the classroom’ in this theme promote skills, knowledge and understanding of concepts related to environmental, economic and social impacts on a sustainable future, and the challenges in managing resources within sustainable agricultural systems.

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|  | **Levels 7 and 8** | **Levels 9 and 10** |
| **Key messages** | * Personal and community action can change the foods that are available locally and globally. * Environmental and social sustainability factors impact on the management of food and fibre industries in Australia and globally. | * Economic and social, including political, complexities influence food production, supply and demand in Australia and around the globe. * The viability of agricultural and/or horticultural practices is heavily influenced by economic, ethical, and environmental and social sustainability considerations. |
| **Ideas for the classroom** | * Explore the [FoodPrint Melbourne](https://fuse.education.vic.gov.au/ResourcePackage/ByPin?pin=WMGDK2) resources and infographics and develop student podcasts outlining how we can have a resilient and sustainable food bowl for Victoria. * Investigate the growing global population and discuss the need to increase food production using cost-efficient, ethical and sustainable production techniques. * Explain how geography, climate and technologies can impact on availability of food in Australia. * Select appropriate materials when working with animals and plants and acknowledge sustainability requirements by using life cycle thinking strategies. (Life cycle thinking strategies refer to identifying possible improvements to products, services and environments to reduce environmental impact and resource consumption while considering social and economic impacts.) * Investigate the ethics and principles of permaculture and compare it to traditional agriculture. * Identify environmental considerations in the production of natural and synthetic fibres. Explain how at least one fibre can be produced for sustainability and identify economic considerations in the production of clothing. * Discuss the social and environmental impacts of genetically modified (GM) plants and animals and identify whether these impacts are positive or negative. Include a discussion about how genetic modification positively affects the availability of local foods (for example drought-tolerant wheat) and global foods (for example rice with increased levels of vitamin A). * Research how murnong and tubers were grown and harvested by Aboriginal peoples before European settlement, and discuss the impact that the introduction of sheep had on this staple food. * Explore why it can be challenging for farmers to be both environmentally sustainable and financially sustainable. Discuss whether cost is a barrier to farming becoming more sustainable. | * Conduct a debate exploring the advantages and disadvantages of organic farming. Consider environmental, social and economic sustainability. * Explain the interrelationship of economic, social and environmental sustainability in food and fibre production. * Examine the debates regarding the growing of either cotton or rice in Australia and make a judgment on the sustainability of its production. * Use the resources and data from [FoodPrint Melbourne](https://fuse.education.vic.gov.au/ResourcePackage/ByPin?pin=WMGDK2) to explore if there will be enough water to grow food in Melbourne’s food bowl in the future. Make judgments about the production of food in Melbourne’s food bowl. * Compare the environmental impacts of intensive and extensive production systems and their contribution to food and fibre production. * Explore traditional Aboriginal aquaculture and comment on sustainability. Investigate how this knowledge is being used to support the industry today, for example through the Victorian Aboriginal Fishing Strategy. * Investigate the United Nations’ four dimensions of food security. Show the dimensions and the interrelationships between dimensions visually in a mind map. * Investigate the impact of political interference on agricultural markets globally, for example the consequences of banning live sheep export in Australia and USA’s current trade policy with China. * Explore the requirements to grow a food and fibre crop in your local area. Discuss issues related to environmental, social and economic sustainability and other requirements for its production. Develop a design brief for a suitable environment that would support growing a crop and identify the required resources, including tools and equipment. |
| **Content descriptions** | * Examine and prioritise competing factors including social, ethical, economic and sustainability considerations in the development of technologies and designed solutions to meet community needs for preferred futures [(VCDSTS043)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTS043) * Investigate the ways in which designed solutions evolve locally, nationally, regionally and globally through the creativity, innovation and enterprise of individuals and groups [(VCDSTS044)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTS044) | * 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 [(VCDSTS054)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTS054) * Investigate and make judgements on the ethical and sustainable production and marketing of food and fibre [(VCDSTC057)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC057) * 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 [(VCDSCD060)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD060) |