

Teacher Information

How to Teach Food Systems

What is the Food System?

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

Primary Production is where the food journey begins- with farmers growing the plants and raising the animals or fish that we eat.

Processing occurs when foods are changed from their original state. Sometimes processing is minimal such as washing or peeling plant products or butchering meats into selected cuts. Higher levels of processing such as cooking may be needed to make foods edible, to produce common foods such as bread or cheese, or to preserve foods for future use (e.g. canning, freezing). Extreme levels of processing (ultra-processing) include ingredients derived through industrial processes to create food products that may not look like or contain much of original wholefoods (e.g. some breakfast cereals, instant soups.) Processing also includes packaging of food.

Distribution refers to the movement of food from where it is produced to the point of consumption, such as from the farm to a cleaning facility, or to a factory for processing and packaging. This also includes transport to food storage facilities for later distribution and use, eg warehouses and supermarkets and transport to individual homes. All transportation throughout the system is represented in this step. How far, the type of vehicle (e.g. barge, train, truck, plane, car), and other factors determine the environmental impact of transporting our food.

Access refers to how and where we obtain food, including from supermarkets and other food retail outlets, cafes and restaurants, farmers markets, food processors, wholesalers or growing it ourselves at home. Access can be influenced by many social, economic, environmental and technology factors. Such as where people live, their income, mode of transport and access to technology (e.g. online orders).

Consumption relates to the stage when we as consumers connect with foods. This includes shopping and choosing, preparing, cooking and eating foods. Availability and access are essential for consumption, but other factors such as habits, attitudes, health beliefs knowledge, skills and timing can affect food choice and consumption.

Waste Management refers to minimising food waste or encouraging reuse across the food system. This not only includes our leftover food or food packaging which is thrown in the garbage, but also includes waste from harvesting, processing, distributing and accessing our foods. When food waste is produced it often goes into landfill or the waste disposal system without reuse. When waste food is used for compost, it can be fed back into the system and can be used to help grow more food. Sometimes we can return food packaging to the manufacturer so they can be reused or repurposed.

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Learning progressions are used to understand how students learn scientific topics such as food systems. The below table demonstrates how students' progress through 6 stages of learning about the food system, from being able to name the parts through to discussing the food system as a synthesized whole.

Students firstly understand the food system as **parts**. Once they are able to explain various parts, they begin to explore how the parts **relate to each other as a system**.

Learning Progression		Example	
Parts	Isolated Parts	This is students' most simplistic understanding of the food system and includes being able to list the various parts.	Students identify that farmers grow strawberries. We can buy them at a shop.
	More Parts	This is where students are able to list an ever increasing number of parts of the food system.	Students can list that strawberries are processed, distributed, accessed and consumed.
	Parts Explained	This is where students can advance their understanding to be able to explain the various parts.	Students can explain that there are a number of parts in making jam. For example strawberries are cooked and packaged to make jam.
System	Parts of a System	This is where students start to apply systems thinking and their explanations of the food system should show how different parts interact with one another.	Students identify that the parts of strawberry jam production are part of a linked system between the farmer and the consumer.
	System Relationships	This is where students' explanations show relationships and how those parts interact.	Students can explain the relationships that occur in the production of strawberry jam. i.e. strawberries are transported at various stages of the system including; <ul style="list-style-type: none"> • from the farm to processing • processing to distribution • from access (shops) to home
	Synthesized Whole	This is where students see the entire picture of the food system and their explanations represent the whole system.	Students can explain that strawberries go through a number of parts which forms an interconnected system.

Factors Influencing Food Systems

INFLUENCES	CONTRIBUTING FACTORS	USEFUL RESOURCES
ENVIRONMENT	<ul style="list-style-type: none"> • Natural resources – soils, water, sunlight, air • Biodiversity / Ecosystem – plants, animals • Energy • Climate change • Land use and change • Pollution, emissions and waste – Greenhouse Gases from machinery, chemicals, food transportation, waste, land clearing, landfill; Nitrous oxide (fertilisers in soils), waterways 	<p>Department of Agriculture, Fisheries and Forestry, FOODmap and analysis of the Australian food supply chain http://www.agriculture.gov.au/SiteCollectionDocuments/ag-food/food/national-food-plan/submissions-received/foodmap-analysis-of-the-australian-food-supply-chain-30-july.pdf</p> <p>Department of Agriculture, Food http://www.agriculture.gov.au/ag-farm-food/food</p> <p>Public Health Association Australia, The Food System and Environmental Impacts https://www.phaa.net.au/documents/item/2930</p> <p>Food Safety, Climate Change and the Role of WHO https://www.who.int/foodsafety/publications/all/Climate_Change_Document.pdf</p> <p>Australian Institute of Health and Welfare 2012, Australia's Food and Nutrition 2012 https://www.aihw.gov.au/getmedia/0c26b145-81fa-4a94-af38-d52515885a07/12504.pdf.aspx?inline=true</p> <p>Centre for Ecoliteracy, Understanding Food and Climate Change: Interactive Guide https://www.ecoliteracy.org/download/understanding-food-and-climate-change-interactive-guide#</p> <p>Australian Environmental Grantmakers Network Philanthropy Briefing Sustainable Food Systems https://www.aegn.org.au/wp-content/uploads/2019/03/Sustainable_Food_Briefing_WEB.pdf</p> <p>Australian Environmental Grantmakers Network Philanthropy Briefing The Land and Biodiversity https://www.aegn.org.au/wp-content/uploads/2019/03/Land_and_Biodiversity_WEB.pdf</p> <p>Oxfam Food and Climate https://www.oxfam.org.au/what-we-do/food-and-climate/</p> <p>Urban Farming: Fixing the broken food system & improving health https://www.youtube.com/watch?v=5AcjM5BKfRQ</p>
ECONOMY	<ul style="list-style-type: none"> • Policies • Regulation • Trade agreements (local & international – imports/ exports) • Labour and welfare • Tourism • Resourcing • Market opportunity • Population growth • Urbanisation • Food security – safe, sustainable, sufficient, satisfactory (diverse/ quality) • Charitable or foreign aid 	<p>Economic Impacts of Local and Regional Food Systems, The Economics of Local Food https://localfoodeconomics.com/</p> <p>Sustain: The Australian Food Network http://www.circlesoffood.org/circles/profile-circles/economics/</p> <p>CIAT Sustainable Food Systems https://ciat.cgiar.org/about/strategy/sustainable-food-systems/</p>

TECHNOLOGY	<ul style="list-style-type: none"> • Research and development • Innovation • Resourcing • Agricultural practices and equipment • Energy • Infrastructure • Transportation • Distribution 	<p>Department of Agriculture, Food http://www.agriculture.gov.au/ag-farm-food/food</p> <p>Australia and Food Security in a Changing World, PMSIEC https://www.chiefscientist.gov.au/wp-content/uploads/FoodSecurity_web.pdf</p>
SOCIETY	<ul style="list-style-type: none"> • Health and wellbeing - disease prevention, care • Demographics • Religion • Education • Ethics • Social equity • Food culture • Consumer demand – transparency about food origins, production processes and ingredient labels 	<p>Department of Agriculture, Fisheries and Forestry, FOODmap and analysis of the Australian food supply chain http://www.agriculture.gov.au/SiteCollectionDocuments/ag-food/food/national-food-plan/submissions-received/foodmap-analysis-of-the-australian-food-supply-chain-30-july.pdf</p> <p>Australian Environmental Grantmakers Network Philanthropy Briefing Sustainable Food Systems https://www.aegn.org.au/wp-content/uploads/2019/03/Sustainable_Food_Briefing_WEB.pdf</p>

References

Teachers College Columbia University. (n.d.). *Food Systems*. Retrieved from <https://www.tc.columbia.edu/tisch/research-overview/food-systems>



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