Guiding Question: What makes the food on your plate sustainable?

This **Learning Source** and accompanying **Build Competencies** activities encourage students to think about sustainability in a broader context, including environmental considerations but also ways of life and the range of food production across Canada. Students look at the diversity of farms, organic agriculture, local and global food systems, all as aspects of sustainable food production.

This **Learning Source** provides starting points and information to investigate:

- Sustainable food and farming
- Where Canada grows its food
- Growing sustainable food

Ask students to brainstorm what they think is involved in sustainability. Revisit the food system infographic in the **Learning Source** to brainstorm ways that sustainable practices can be implemented in the various stages that a food product goes through from farm to plate.

As students explore the types of food systems described in the **Learning Source**, have them identify similarities and differences between the processes that are part of each stage.

Build Competencies: Evidence of Sustainability

Students compare foods that come from local, Canadian and global food systems, and assess the factors that influence the production of sustainable food.

This handout includes activities that support competencies, literacy and numeracy, and weblinks to online resources that can support student learning.

Assess

Look for evidence of understanding of the following concepts:

- Food systems
- Organic farming
- Local food systems
- Traditional food systems
- Technology and mechanization
- Sustainable food

For a formative assessment, ask students to apply their learning to a **mind map** or **cause and effect chart** that illustrates the process a food takes from farm to plate in one type of food system - local or global; traditional; organic. Students can centre their mind map or chart on one type - or multiple types - of crops and the machinery used to seed, harvest, process and transport. Alternatively, students can be asked to focus on strategies for reducing food waste in each food system stage.

Additional information and discussion questions are provided in the carousel slide for this guiding question in the sustainable PRACTICES section of the LEARN webpage.

Click on the carousel slide to open and explore the following content.

- Local and global food systems
- The difference between local food and sustainable food

Additional Research or Background Sources

Consult teacher or student background sources such as the examples that follow to further explore, enrich or expand activities for this guiding question. Student research sources are also provided in **Build Competencies** handouts.

The Canada 150: It's just the beginning video can be used to introduce this learning experience. The video was shot using modern high-tech agriculture technology. Find it at www.agr.gc.ca/eng/news-from-agriculture-and-agri-food-canada/scientific-achievements-in-agriculture/canada-150-its-just-the-beginning-video/?id=1478809922673. What message does this video share about diversity and sustainability in agriculture?

Crop Life Canada provides an infographic What does it take to feed 35 million Canadians and send food around the world? at https://helpingcanadagrow.ca/wp-content/uploads/2016/01/CropLife_Factsheet_Grow.pdf that provides an overview of several aspects related to sustainability and the food system. Encourage students to consider the perspectives represented in the infographic from Crop Life Canada.

Policy Options provides an article Beware the glitz of neo-industrial agriculture, which discusses the push to intensify agricultural production and provides arguments for supporting small-scale farms based on ecological models. Some parts of the article also address the connections between global and local agriculture. Find the article at https://policyoptions.irpp.org/magazines/may-2017/beware-the-glitz-of-neo-industrial-agriculture/.

The Soil Conservation Council of Canada provides regular news release focused on soil health, testing, land use and other topics, found at https://soilcc.ca/news/.

The Government of Canada Report of the Standing Senate Committee on Agriculture and Forestry titled How to Keep Farmland in the Hands of Canadian Farmers, found at http://publications.gc.ca/collections/collection_2018/sen/yc27-0/YC27-0-421-10-eng.pdf, provides some background information on the use of farmland and on environmental factors explaining the impact on farmland availability in Canada.

Find a perspective on the "myth" that family farms are disappearing in the Farm Ontario online publication, Opinion: The family farm is changing but not dying, accessed at https://farmtario.com/news/opinion-the-family-farm-is-changing-but-not-dying/. There are fewer smaller farms, but the numbers show that doesn't mean fewer families running farms.

The Canadian Roundtable for Sustainable Crops website provides detailed metrics/lists of criteria for sustainable practices and strategies implemented by Canadian grain farmers. This information is suitable as teacher background, but could be used to identify indicators of sustainability and associated actions or recommendations that can inform students' research and project work. Access the reports and metrics at http://metrics.sustainablecrops.ca/.

ALUS is an organization that focuses on the connection between agriculture and natural environments. ALUS invests in farmers and works with them to produce acres of clean air, clean water, wildlife habitat and other ecosystem services in their communities. ALUS projects are found in Alberta.

Find information about ALUS and their projects at https://alus.ca/. Research reports can be found at https://alus.ca/resources/research/.

Find **Science 7 and 8** learning outcomes supported by this learning experience on the following page.

Use this activity to make connections between concepts related to ecosystem porcesses, agricultural practices, mechanization and technology and food systems. Encourage students to reflect on ways that different approaches to agriculture and food production directly affects the foods that are available to them.

Regeneration Canada, at https://regenerationcanada.org/en/, promotes the practice of regenerative agriculture. Regeneration Canada is a nonprofit organization dedicated to promoting soil regeneration in order to mitigate climate change, restore biodiversity, improve water cycles, and support a healthy food system. A webpage that could be shared with students that is focused on regenerative agriculture and soil can be accessed at https://alus.ca/resources/research/.

> ACCOMMODATE AND/OR EXTEND LEARNING

The Canadian Centre for Food Integrity's 2020 report on sustainability identifies sustainability's most popular phrases found on social media. Have students **survey** friends and family members to identify words that they most associate with sustainability.

Have students report their findings and work with them to collate words and phrases. Students can be asked to create their own **word clouds**, using apps like **WordArt** or **Mentimeter**. Alternatively, students can create **bar graphs** to identify frequency of words and phrases they've collected.

Learning Experience Six: Learning Outcomes and Competency Map

project AGRICULTURE Activity	GRADE 7 AND 8 SCIENCE	
	CONCEPTUAL KNOWLEDGE	**PROCEDURAL KNOWLEDGE**
LEARNING SOURCES What makes the food on your plate sustainable? **BUILD COMPETENCIES** Making Sustainable Food Connections	**Grade 7 Science Unit A: Interactions and Ecosystems** 1. Investigate and describe relationships between humans and their environments, and identify related issues and scientific questions • illustrate how life-supporting environments meet the needs of living things for nutrients, energy sources, moisture, suitable habitat, and exchange of gases • describe examples of interaction and interdependency within an ecosystem (e.g., identify examples of dependency between species, and describe adaptations involved; identify changing relationships between humans and their environments, over time and in different cultures—as, for example, in aboriginal cultures) • identify examples of human impacts on ecosystems, and investigate and analyze the link between these impacts and the human wants and needs that give rise to them (e.g., identify impacts of the use of plants and animals as sources of food, fibre and other materials; identify potential impacts of waste products on environments	**Grade 7 Science Unit A: Interactions and Ecosystems** Ask questions about the relationships between and among observable variables, and plan investigations to address those • identify science-related issues (e.g., identify a specific issue regarding human impacts on environments) Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data • research information relevant to a given problem or issue • select and integrate information from various print and electronic sources or from several parts of the same source (e.g., compile information on a global environmental issue from books, magazines, pamphlets and Internet sites, as well as from conversations with experts) Analyze qualitative and quantitative data, and develop and assess possible explanations • compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs and line graphs (e.g., illustrate a food web, based on observations made within a given environment) Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results • communicate questions, ideas, intentions, plans and results, using lists, notes in point form, sentences, data tables, graphs, drawings, oral language and other means (e.g., present findings from an analysis of a local issue, such as the control of the beaver population in a nearby wetland)
	Grade 8 Science Unit D: Mechanical Systems 1. Illustrate the development of science and technology by describing, comparing and interpreting mechanical devices that have been improved over time • illustrate how a common need has been met in different ways over time (e.g., development of different kinds of lifting devices) 4. Analyze the social and environmental contexts of science and technology, as they apply to the development of mechanical devices • illustrate how technological development is influenced by advances in science, and by changes in society and the environment	**Grade 8 Science Unit D: Mechanical Systems** Ask questions about the relationships between and among observable variables, and plan investigations to address those questions • identify practical problems (e.g., identify problems related to the effectiveness or efficiency of a mechanical device) Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data • research information relevant to a given problem • select and integrate information from various print and electronic sources or from several parts of the same source Analyze qualitative and quantitative data, and develop and assess possible explanations • identify and evaluate potential applications of findings (e.g., identify possible applications of a simple machine or mechanical system they have studied) Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results • communicate practical problems, plans and results in a variety of ways, using written and oral language, data tables, graphs, drawings and other means (e.g., describe, using pictures and words, the transmission of a force through a mechanical system)