



Growing Up Organic operates on traditional and unceded territory of the Algonquins: now known to many as Ottawa, and now home to many from across Turtle Island and beyond.

Grades 6-7

Seed Starting

Mindfulness minute: If it speaks to you, take two minutes with your students before this workshop to slow down and root down with this mindfulness minute.

LESSON FOCUS AND GOALS

Start seedlings for the garden while exploring the importance of seed biodiversity and heirloom varieties

LEARNING OBJECTIVES

Grade 6

Science and Technology: Understanding Life Systems

OVERALL EXPECTATIONS:

1. Assess human impacts on biodiversity, and identify ways of preserving biodiversity;
3. Demonstrate an understanding of biodiversity, its contributions to the stability of natural systems, and its benefits to humans.

SEPCIFIC EXPECTATIONS:

- 1.2 - Assess the benefits that human societies derive from biodiversity and the problems that occur when biodiversity is diminished
- 3.2 - Demonstrate an understanding of biodiversity as the variety of life on earth, including variety within each species of plant and animal, among species of plants and animals in communities, and among communities and the physical landscapes that support them
- 3.3 - Describe ways in which biodiversity within species is important for maintaining the resilience of those species
- 3.4 - Describe ways in which biodiversity within and among communities is important for maintaining the resilience of these communities (e.g., having a variety of species of wheat allows for some part of the crop to survive adverse conditions)
- 3.5 - Describe interrelationships within species, between species (e.g., birds and bees take sustenance from plants and carry pollen between plants), and between species and their environment (e.g., algae and water lilies compete for sunlight in a pond), and explain how these interrelationships sustain biodiversity;
- 3.6 - Identify everyday products that come from a diversity of organisms



Social Studies: People and Environments

SPECIFIC EXPECTATIONS:

B3.9 – Describe some different ways in which citizens can take action to address social and environmental issues

Grade 7

Science and Technology: Understanding Life Systems

OVERALL EXPECTATIONS:

1. Assess the impacts of human activities and technologies on the environment, and evaluate ways of controlling these impacts;

SPECIFIC EXPECTATIONS:

3.8 – Identify common sources of greenhouse gases (e.g., carbon dioxide comes from plant and animal respiration and the burning of fossil fuels; methane comes from wetlands, grazing livestock, termites, fossil fuel extraction, and landfills; nitrous oxide comes from soils and nitrogen fertilizers), and describe ways of reducing emissions of these gases.

Geography: Physical Patterns in a Changing World

OVERALL EXPECTATIONS:

A1. Analyse some challenges and opportunities presented by the physical environment and ways in which people have responded to them

A2. Use the geographic inquiry process to investigate the impact of natural events and/or human activities that change the physical environment, exploring the impact from a geographic perspective

A3. Demonstrate an understanding of significant patterns in Earth's physical features and of some natural processes and human activities that create and change those features

SPECIFIC EXPECTATIONS:

A1.1 – Describe various ways in which people have responded to challenges and opportunities presented by the physical environment (e.g., building dams, levees, or dikes to contain water and/or reclaim land; building terraces or irrigation systems to permit farming on inhospitable land;), and analyse short- and long-term effects of some of these responses (e.g., water pollution from industry and agriculture; loss of animal habitat and wilderness areas as human settlement expands; deforestation and its consequences; the development of provincial or national parks to protect wilderness areas)

A1.2 – Compare and contrast the perspectives of some different groups (e.g., Indigenous peoples living on the land, organic versus large-scale farmers, industrial and agrarian societies, owners of resource-extraction companies, environmental organizations, land developers) on the challenges and opportunities presented by the natural environment.

A2.1 – Formulate questions to guide investigations into the impact of natural events and/or human activities that change the physical environment, ensuring that their questions reflect a geographic perspective.

A3.10 – Describe some key natural processes and human activities (e.g., natural and human-influenced climate change, erosion of top soil, deforestation, the use of chemical fertilizers and practice of monoculture, grazing of domestic animals, activities that introduce invasive species into an environment) that create and change natural vegetation patterns



Geography: Natural Resources Around the World: Use and Sustainability

OVERALL EXPECTATIONS:

B2.1 – Formulate questions to guide investigations into issues related to the impact of the extraction/harvesting and/or use of natural resources around the world from a geographic perspective (e.g., the social, economic, political, and environmental impact of overfishing; the economic, social, and environmental impact of deforestation and the adequacy of reforestation programs; the social and economic impact on indigenous people of resource extraction in their traditional territories; the economic, political, and environmental impact of developments in the alternative energy sector; the economic, political, and environmental impact of using fossil fuels);

B3.1 – Identify Earth’s renewable, non-renewable, and flow resources (e.g., renewable: trees, natural fish stocks, soil, plants; non-renewable: fossil fuels, metallic minerals; flow: solar, running water, ocean currents, tides, wind), and explain their relationship to Earth’s physical features;

B3.5 – Describe some responses to social and/or environmental challenges arising from the use of natural resources (e.g., the increased use of wind, solar, or tidal energy; reduced consumption; promotion of energy-saving strategies such as the use of energy-efficient appliances; promotion of fair trade; marketing of “ethical” products such as “ethical oil” or “ethical diamonds”; boycotting less sustainable products or companies using unsustainable practices)

Health and Physical Education: Healthy Living

OVERALL EXPECTATIONS:

D3. Demonstrate the ability to make connections that relate to health and well-being – how their choices and behaviours affect both themselves and others, and how factors in the world around them affect their own and others’ health and well-being.

SPECIFIC EXPECTATIONS:

D3.1 – Demonstrate an understanding of personal and external factors that affect people’s food choices and eating routines



MATERIALS NEEDED

USC Movie: The Story of Food: <https://www.youtube.com/watch?v=PzGSHTP-U20>

Newspaper strips approximately 4" wide

Full soda cans

Soil-less seed starting mix

Open-Pollinated Organic Seeds of various heirloom varieties

Popsicle sticks

Plastic tray

STRUCTURE / ACTIVITY

Part One: Seed Diversity

Introduce students to the concept of heirloom seeds. Discussion points:

Can anyone define what we mean when we say heirloom? Does anyone have heirlooms in their own family? Like important family heirlooms, heirloom seed varieties are passed down from generation to generation, preserving biodiversity along the way. While we often rely on a few varieties of vegetable species, there exist hundreds more; unfortunately, we are losing this biodiversity at a rapid rate.

Watch: The Story of Food.

Discuss what students learned or found most interesting in the movie. Discussion points:

Why do you think we have so few varieties in the grocery store?

What happened to the road to market in the movie?

Divide students into groups of three to four. Explain that each group will be thinking like a different type of farmer (see Farm Types below). Ask students to read the description and use the information from the photographs of each farm type to consider the following questions from the perspective of the farmer:

To whom do I sell my crops?

How far will my food travel to reach the consumer?

Who helps me plant, tend, and harvest the crops?

How will the plants be watered?

Where do the nutrients for the plants come from?

What kind of machines can I buy to help me with my work?

Give students a few minutes to discuss, then consolidate the farmer experiences as a group.

Who is going to buy your crops? A wholesaler? The end consumer? Will there only be enough for your family? How many of you have access to an irrigation system? Who has a tractor to harvest? Who wants all the harvest to be ready at once?

Ask students if they think the tomato suitable for the producer in California will work for the farmer in Eastern Ontario? Why? What characteristics would the farmer in Eastern Ontario be looking for? How might their selection criteria be similar to the subsistence farmer in South Asia?

Think about last summer – did we have a lot of rain? If I can't water (or put in drainage) how can I deal with fluctuating weather?



When the farmer is harvesting most of the crop by hand and without extra help, would they prefer everything to mature (be ready) at the same time or more gradually?

Farmers approach their crop in the context of their livelihood, and thus many characteristics are important—rather than just the yield of a particular crop. For example, if they actually eat what they produce, taste is also highly relevant. Selection and breeding thus becomes a juggling act between many interdependent factors. These are just a few:

- pest resistance;
- labour requirement;
- secondary yields (like leaves for food or fodder)
- how easy the crop is to conserve/store;
- drought resistance and sensitivity to water logging;
- early vs. late maturation;
- taste;
- production in poor soils without fertilizer;
- and capacity to withstand strong winds.

Sum up by discussing why it might be dangerous to rely solely on a few varieties. What is the danger of mono-cropping? Can you think of any instances in history when this has become a problem?

Describe that today we will be planting several varieties of (insert vegetable) for our garden. Give a quick summary of key characteristics of each, and link to selection factors above so students can make a selection of which variety to plant.

Part two: Planting Seeds See link: Paper Seed-Starting Pots on GUO Website.

Have students create paper pots and fill them with prepared soil-less mix. Plant one seed in each pot according to seed packet instructions. Identify what vegetable (and variety) has been planted on one side of the Popsicle stick, and the student's name on the other side. Place the seedlings on a plastic tray and keep them in a warm spot for germination (a light table is ideal); water daily. A watering schedule with assigned responsibilities can help ensure that seedlings receive proper daily care.

Extension EcoKids: "What does biodiversity have to do with the food we eat?" – In this lesson, students keep a daily food log for three days. After, they investigate how their food consumption depends on genetic and species diversity. Available online at: www.ecokids.ca

Farm-Types

CSA Farm You and your family run a community-supported-agriculture scheme in Eastern Ontario. Fifty families and two restaurants buy boxes of fresh produce from you during the harvest season (From May to November). Your clientele is environmentally friendly and is keen to try new things frequently.

Commercial Orchard You are a commercial orchard that produces apples primarily for brand name juice. You are based in Southern Ontario and need to supply juice to regional processors year-round. In the fall when apples are ready to be picked, most of your labour comes from Mexico to help with the harvest.

Subsistence Farmer You are a subsistence farmer in South Asia. You have very little income to spend on farm inputs and rely on your farm for meeting your family's dietary needs.

Commercial Potato Farmer You are a commercial potato farmer in the Andes mountains of Peru. You sell most of your crop on the local market and need to be ready for fluctuating climatic conditions. Your crop is harvested by manual labour from your family and local labourers.

Commercial Tomato Producer You are a large specialized commercial tomato producer in California. Most of your tomatoes are shipped to Canada for fresh sale in grocery stores. While you do have some farm labour, much of the work on the farm is mechanized.