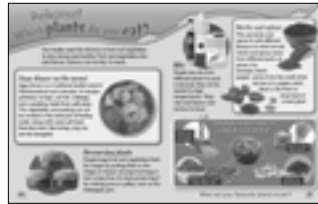


Why Are Plants Important?



Focus: Students explore the importance of plants to the environment, the ways in which humans use plants, and how we can conserve and replenish plants.

Specific Curriculum Outcomes

Students will be expected to:

- 49.0 describe ways in which plants are important to living things and the environment [GCO 1/3]
- 50.0 identify parts of different plants that provide humans with useful products, and describe the preparation that is required to obtain these products and how our supply of useful plants is replenished [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- list ways in which plants support living things and the environment
- identify and describe useful products made from plants
- discuss how humans can support, conserve, and replace plants we use
- create a poster or collage highlighting how plants help living things and the environment

NOTES:

Attitude Outcome Statements

Encourage students to:

- be sensitive to the needs of other people, other living things, and the local environment [GCO 4]

Cross-Curricular Connections

Math

It is expected that students will:

- construct, label, and interpret bar graphs to solve problems [3SP2]

English Language Arts

Students will be expected to:

- interact with sensitivity and respect, considering the situation, audience, and purpose [GCO 3]
- create texts collaboratively and independently, using a variety of forms for a range of audiences and purposes [GCO 9]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• Student Magazine, pages 24–31 • IWB Activity 8 • BLM <i>Plant Scavenger Hunt</i> • BLM <i>Plant Placemat</i> • IWB Activity 9 Literacy Place • <i>Explore! Magazine: Nature Up Close</i> (“Find the Products From Nature,” pp. 4–5, Shared Reading–Nature Watch Inquiry Unit) • <i>Solomon’s Tree</i> (Read Aloud–Making Connections Strategy Unit)	• plant-based products for artifact box, Curiosity Centre, and plant part activity: fruit, vegetables, spices, shampoo, perfume, elastic bands, cotton and hemp fabric, wooden items, paper items • freshly cut green leaves • large clear bowl • students’ Science Journals • large sheet of paper • construction paper for graph • plants for dyeing experiment (e.g., onion skins, tea, turmeric powder, avocado skins, beets, blueberries, and goldenrod) • cheesecloth • large pot • students’ Science Folders • digital camera (optional)	• Send a note home asking parents to send in white cloth items for dyeing such as socks, a T-shirt, or a tea towel. • Arrange for a visit from an Elder or Indigenous Knowledge Keeper from a local Indigenous group to discuss uses of local plants and seaweed.	

Safety

- If you do the dyeing activity, be very cautious working with large amounts of hot water.
- Be aware of any allergies students might have when adding materials to the Curiosity Centre or choosing plants to work with.

Science Background

- Plants are essential to all life on Earth. Here are some of the ways plants benefit the environment:
 - Air: plants release oxygen as a by-product of photosynthesis, replenishing the oxygen used by both animals and plants in metabolism.
 - Food: many animals, including humans, depend on plants for food. Animals that eat other animals depend on plants indirectly, since their food eats plants.
 - Water: plants help clean water and move water from soil into the atmosphere.
 - Soil: plant roots prevent erosion; dead plants form humus, enriching the soil.
 - Habitat: many animals depend on plants for shelter.
- Humans use plants in a huge variety of ways: for food and flavourings, for building, for dyes, fuels, fibres, gums and resins, medicines, and perfumes; and to add oxygen within buildings.
- Indigenous peoples made wide use of plants for food, medicine, shelter, and for tracking/hunting animals. They shared this knowledge with the early European settlers which helped them to survive in the new environment.
- Using plants responsibly means finding ways to replenish the plants we consume. For example, on a large scale, seedling trees can be planted to replace trees that have been logged. On a smaller scale, people can plant native plants, vegetable gardens, and trees on their properties.

Possible Misconceptions

- Students may not realize that plants use oxygen as well as produce it. Through photosynthesis, plants use sunlight, water, and carbon dioxide to make their own food—glucose. But like animals, plants use the energy stored as glucose through a process called respiration. In respiration, oxygen is consumed and carbon dioxide is released. However, plants produce more oxygen than they consume, and consume more carbon dioxide than they release, so the overall effect is that oxygen is released and carbon dioxide is consumed. Tell students that plants use energy to grow and do other functions, like animals, and they use oxygen for these processes.

ACTIVATE

Artifact Box

Fill a box with items that are either made of plants or include ingredients made of plants. Include obvious items such as fruit and vegetables, but also include items such as shampoo, spices, and elastic bands that students might not immediately associate with plants. You might check with a local Native Friendship Centre or Indigenous group or person to identify a local item that could be included.

As each item is revealed, ask students:

- **What is this object?**
- **How would you describe it?**
- **What is it used for?**
- **What is it made of?**

After discussing each item, display it on a table. Once all of the items have been displayed, ask students to tell you what they all have in common. Write their ideas on the board. Draw out the idea that all of the items are made of plants or have plant-based ingredients.

Allow time for students to read pages 24–25 of the Student Magazine then ask:

- **Which of these items do you use regularly?**
- **What other things do you use that are made of plants?**

Record students' ideas on the board and have students add any new questions to the I Wonder Wall.



Literacy Place Connection:

Read or revisit “Find the Products From Nature” from *Explore! Magazine: Nature Up Close* (Shared Reading). Challenge students to identify the products made from plants. How many can they find? (See the inside back cover of the magazine for answers.)

Curiosity Centre

Stock the Curiosity Centre with items made from plants. Include items made of cotton, hemp, wood, and paper. Include a variety of spices and herbs. Include dried vegetables and fruit. If possible, include items or models from Indigenous culture. Allow students time for exploration. Remind them to record their questions on the I Wonder Wall.



CONNECT

Bubbling Leaves: Oxygen

Place freshly cut green leaves in a large, clear bowl of water and leave them in the sunlight. Have students observe the leaves carefully. Ask students to predict what, if anything, will happen.

After an hour, have students examine the leaves again. Students should notice small bubbles at the edges of the leaves. Have students record their observations and possible explanations in their Science Journals. Ask:

- **What do you think is causing the bubbles to form?**





IWB Activity:

- Students can use Activity 8: *What is it made of?* (see the Teacher's Website) to match plants and the products made from them.



Students should already be familiar with the idea of photosynthesis. Remind students that through photosynthesis, plants use sunlight and carbon dioxide to make their own food. They give off oxygen, which is essential for humans and all other animals to breathe. Plants in the water also produce oxygen, which is used by fish and other animals that live underwater.

You may wish to explain to students that just like animals, plants also take in oxygen and give off carbon dioxide as they use the food they make. But overall, plants give off more oxygen than they take in.

Eat Your Veggies!

Share pages 26–27 of the Student Magazine with the class and discuss the various ways we use plants for food. Ask students to tell what vegetables they ate yesterday. As a class, brainstorm a list of vegetables. Then have each student tell his or her favourite vegetable on the list and make a checkmark beside the vegetable. Then, as a class, make a bar graph showing how many people in the class liked each one.

Ask students why it is important to eat vegetables. (Vegetables provide dietary fibre, vitamins, minerals, water, and energy.) Record students' answers. Encourage students to ask questions about why vegetables are important to eat and record these questions on the I Wonder Wall.

Dyeing Using Plants

Invite students to bring in old white T-shirts, tea towels, or other white cloth items. As a class, experiment with making dyes from plant materials. Onion skins, tea, turmeric powder, avocado skins, beets, blueberries, and goldenrod all make good dyes.

To make the dye, wrap the plant matter securely in a piece of cheesecloth and tie it shut. Put it in a pot of cold water along with the fabric to be dyed. Heat the contents to a simmer and keep simmering for several hours. (If it is not possible to do this in class, you could send dye bundles home with students with instructions for them to do the activity with an adult.) Check the colour of the cloth periodically by lifting it out of the dye with tongs. When the cloth is done, rinse it in warm water and allow it to air-dry. The leftover dye can be filtered, saved, and used again. Experiment with tie-dyeing effects!

CAUTION: Use caution when working with large amounts of hot water and take steps to avoid spills. Dyes may stain students' clothing so they should wear smocks or old clothes. The dyed cloth will likely not be colourfast and should not be washed with other items that may stain.



Plant Scavenger Hunt

Provide students with copies of BLM *Plant Scavenger Hunt*. Have them complete the BLM by doing a plant scavenger hunt at home with the help of a parent or guardian. Students should find two different examples at home of items made of plants or containing plant materials for each of the six categories:

- things to read (e.g., newspapers, books, and magazines, all made from paper and therefore trees)
- things to wear (e.g., jeans, T-shirts, socks, and dresses may all be made from cotton from the cotton plant)
- things to eat (e.g., fruit and vegetables and anything made from them; herbs and spices; oils; flour; sugar)
- hygiene products (e.g., shampoo containing herbal extracts; scented items containing floral extracts; soothing cream containing aloe)
- furniture (e.g., chairs and tables may be made from wood and therefore trees; furniture may also be made from rattan, made from palm stems)
- parts of your home (e.g., doors, trim, floors, and windows may all be made of wood)



In class, have students tell about what they found and make a class list of different items in the six categories. Completed BLMs can be stored in the students' Science Folders.

Seaweed Facts

If possible, arrange for an Elder or Indigenous Knowledge Keeper from a local Indigenous group to visit and discuss traditional uses of seaweed, as well as ways in which other plants are important to living things and the land and sea, according to traditional knowledge. Encourage students to ask questions.

After the visit, or as an alternative, share pages 28–29 of the Student Magazine to continue the discussion of seaweed. Emphasize the idea that most seaweed is not a true plant, but algae. However, it shares many similarities with plants. Perhaps most importantly, like plants, it takes in carbon dioxide and releases oxygen.



Tree Hunting

Ask students:

- **How do trees help the environment?**

Record students' answers. Then, go for a "tree hunt" in a place outdoors where a variety of trees can be found. Have students observe the trees and think about the ways they are interacting with the environment. Ask:

- **What are these trees doing for the air and earth around them?**
- **How are these trees being used by local animals?**



Students should record their observations and inferences in their Science Journals.



Back in the classroom, add to the existing list based on students' observations. Make a large tree out of construction paper and distribute leaves. On the leaves, students can write different roles of trees in the environment as well as ways people use trees (e.g., shade, animal habitat, soil drainage, supply of food for animals and people, paper, wood, and oxygen production). Ask students:

- **Why do people cut down trees?** (To make room for houses and farms; to make wood, paper, and other products)
- **How can we be more responsible about how we use trees?** (selective cutting instead of clear-cutting; replacing cut trees with seedlings; reducing our use of trees for paper and other uses)

Share pages 30–31 of the Student Magazine. Ask students to consider the uses of plants other than trees. For each plant suggested, ask:

- **How does this plant benefit the environment?**
- **How do people use this plant?**
- **How can we conserve this plant and replenish it when we use it?**

Record students' responses on a chart and add any questions to the I Wonder Wall.

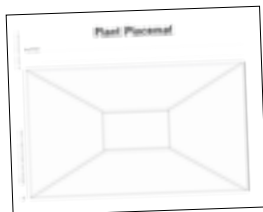


Literacy Place Connection:

Read aloud *Solomon's Tree* by Andrea Spalding and Janet Wilson. Ask:

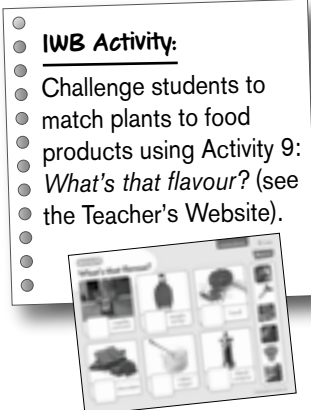
- **How do we know that trees are plants?**
- **How did Solomon's tree change through the seasons?**
- **What do the final words of the story ("A new beginning.") mean?**
- **How did Solomon feel about his tree?**
- **How do we know that it was important to him?**
- **Do you think Solomon saw the spirit of his special tree in the finished mask? How do you know?**

CONSOLIDATE



Placemat Activity

Divide the class into groups of four students and provide each group with BLM *Plant Placemat*. Each group member should think about ways that plants are important to the environment and record their main ideas in one section around the edge of the placemat BLM. As a group, students should agree on the three most significant ways that plants are important to living things and the environment and record these in the centre space. Display the placemats around the classroom.



What Plant Part Is It Made Of?

Bring out a variety of familiar plant parts and products made from plant parts. Ask students to identify what part of the plant they come from. Examples could include:

- carrot (root)
- apple (fruit)
- lettuce (leaf)
- cinnamon stick (bark)
- dried oregano (leaf)
- rose perfume (flower)
- wood (stem)

Assign groups of students plant parts (root, fruit, leaf, bark, flower, stem) and have them make a collage showing examples of products made from that part.

Growing Vegetables

Have students enlist the help of an adult to plant vegetables at home or in the school garden. Have them keep a record of their plantings using digital photography or a written journal with sketches, describing how the plants were planted and tended, tracking plants' growth, and eventually describing how they used the vegetables they grew.

EXPLORE MORE

Joseph Priestley's Candle Experiment

Have students research online to find out about Joseph Priestley's experiment involving a mint plant and a candle. In this experiment, which he carried out in 1771, Priestley put a mint plant in a sealed, clear container along with a burning candle. Eventually, the burning candle went out. About a month later, Priestley relit the candle without opening the container. (He did this by focusing sunlight on the candle wick.) The candle once again burned. This experiment showed that plants changed what was in the air.

Priestley's experiment led him to hypothesize that plants release something that animals need to breathe—the gas we now know as oxygen. Further experiments showed that a mouse kept in a sealed container with a plant would live longer than if there was no plant present. Because of his experiments, Priestley is considered by many to be the discoverer of oxygen.

If time permits, students can make diagrams or models to show what happened in Priestley's experiment.

WRAPPING UP THE UNIT



Revisit any remaining questions posted on the I Wonder Wall and have students discuss answers in small groups or with a partner. If there are questions that cannot be answered at the time, these can remain on the I Wonder Wall for students to research independently.

Discuss what students have learned about plant growth and changes, including parts of plants, how the life of a plant begins, what plants need, life cycles of plants, and how plants are important to people and the environment.

Plant Scavenger Hunt

Name: _____

Search your home to find two examples of items made using plants for each category.

Things to read Item 1: What plant is it made from? Item 2: What plant is it made from?	Things to wear Item 1: What plant is it made from? Item 2: What plant is it made from?
Things to eat Item 1: What plant is it made from? Item 2: What plant is it made from?	Hygiene products Item 1: What plant is it made from? Item 2: What plant is it made from?
Furniture Item 1: What plant is it made from? Item 2: What plant is it made from?	Parts of your home Item 1: What plant is it made from? Item 2: What plant is it made from?

Plant Placemat

Names: _____

