

Pollination By-Products



Learning Objectives

Students will be able to:

- Describe the importance and value of the pollination process to humans.
- Trace the origin of common foods to their plant source.
- Identify the role of pollinators in renewal of the food sources.
- Identify possible threats to biotic pollinators.



Method

Students identify the plant origin for a number of common foods and find out which pollinating agent makes them possible.



Materials

- A selection of popular foods

Background

The value of pollinators is immeasurable. Without pollination, many plants could not reproduce. Food webs – and therefore ecosystems – would collapse. We would run out of food, medicine, wood products and almost everything we need to survive. Consider these pollinator products and by-products:

- **Food** - Many of the foods we love – including bananas, apples, chocolate and more than half the world's supply of dietary fats and oils – is the result of the successful work of pollinators. We also get beverages, fibres, condiments, spices and medicines from plants that rely on pollination. Don't forget that wildlife rely on food made possible by pollinators.
- **Forests** - Trees are seed-bearing plants thrive thanks to pollination. Our maples, ashes and oaks of the Canadian South and East, the giant firs and cedars of the West and the spruces of the Boreal North all rely on the process of pollination to renew themselves. Their success is our success, since we rely on wood for our homes, paper, jobs and recreation.
- **Fresh Air** - Green plants are the Earth's "lungs," taking in carbon dioxide and releasing oxygen. The majority of these plant species rely on pollination to renew themselves.
- **Clean Water** - Aquatic flowering plants purify water by taking up nutrients and contaminants and plants rooted along shorelines and steep slopes also help keep soil in place. These plants all require pollination services.

For additional resources visit:

CanadianWildlifeFederation.ca/Education

- **Biodiversity** - Healthy ecosystems rely on biodiversity. The process of pollination contributes on at least two levels:
 - Genetic diversity (the hereditary differences between members of the same species) is made possible by the successful transfer of pollen from one plant to another. A plant population with a diverse genetic make-up is better able to fight off diseases and parasites and can adapt more successfully to changing environmental conditions.
 - The success of seed-producing plants in general increases the species diversity of ecosystems, which, in turn, makes those ecosystems healthier.
 - **Money** - Pollination and its products help keep our economy healthy. It is estimated that insect pollination is responsible for \$1 billion worth of fruits and vegetables in Canada every year.
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Activity

In Advance

- Prepare a selection of popular foods. Use [Canada's Food Guide](#) or create your own list of foods. Consider bringing in fresh local produce to reinforce the connection to the human food supply. See the sample table at the end of this activity if you need ideas.

Procedure

1. Discuss with the students that many of the things we take for granted come from seed-bearing plants, such as food and clothing.
2. Share the selection of popular foods you prepared with the class.
3. Help the students trace which of the foods come directly or indirectly from plants.
4. Discuss which of the plants reproduce through flowers (it may be all) and which rely on animal pollinators.
5. Identify possible threats to the pollinators and predict possible consequences of pollinators becoming endangered or extinct. Discuss how our eating habits would have to change if common pollinators were to become endangered.

Variations

- Divide the class into groups. Assign a food to each group and have them research whether it came from flowering plants. Groups should report their findings to the class. Encourage them to use creative techniques such as dramatic interpretations, an essay or a poster.

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Extensions

- Discuss how high winds and heavy rain that may be caused by climate change could affect plants relying on windborne pollination.
- Develop a mural that illustrates products, plants and pollinators, depicts their interconnections, and shows some of the threats to the pollination process.
- Conduct a "where does our food come from?" investigation by using Canada's Food Guide and grocery store flyers.
- Research the flower emblem of their province or territory, how it is pollinated and how it is protected in Canada.

Sample Foods

Product	Plant	Pollinator	Threats
Honey	Clover or other flowering plants through honeybees	Honeybee	Pesticides, parasites, colony collapse disorder, climate change
Apples	Apple tree	Mason bee	Pesticides, parasites, loss of habitat, climate change
Almonds	Almond tree	Honeybee	Pesticides, parasites, colony collapse disorder, climate change
Chocolate	Cocoa tree	Midge	Pesticides
Maple syrup	Sugar maple tree	Bumblebee	Pesticides, parasites, loss of habitat, climate change
Ketchup	Tomato plant	Halictid bee	Pesticides, parasites, loss of habitat, climate change
French fries	Potato plant	Bumblebee	Pesticides, parasites, loss of habitat, climate change
Jack-o'-lantern	Pumpkin plant	Squash bee	Pesticides, parasites, loss of habitat, climate change
Green salad	Lettuce plant	Flies	Pesticides, parasites, loss of habitat, climate change
Blueberries	Blueberry plant	Digger bee	Pesticides, parasites, loss of habitat, climate change

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