LiveWell Kids
Garden and Nutrition Program

Lesson 5: Plants From Pollination to Food

KINDERGARTEN

OBJECTIVES

By the end of this lesson, students will:

- Observe the anatomy of a flower and become aware that each part has an important job.
- Identify the main parts of a plant.
- Recognize that people eat a variety of foods that are parts of plants.
- Learn about a plant's life cycle, including the role of seeds.
- Understand the role of pollinators and observe pollination in the school garden.

SUPPLIES

- For this lesson, we ask that **you supply** the following for dissection:
  - One or more flowers that clearly show reproductive parts (variety helps.)
    - Example: Lily, Tulip
  - One or more pieces of fruit or pods that clearly show seeds (variety helps.)
    - Examples: Tomato, Milkweed Pod
  - Put your flowers in a vase with water, or refrigerate, before lesson delivery to prevent wilting.

- Supplies to bring from the shed to the garden:
  - Laminates
    - *The Life Cycle of a Plant*
    - *Anatomy of a Flower*
    - *Flower to Fruit Process*
    - *Parts of a Plant*
  - 2 Cafeteria trays
  - Knife
  - Cutting Board
  - Magnifying lenses
  - Tweezers
  - Whiteboard and dry-erase marker

- Supplies to bring from classroom to garden - *arrange with the teacher ahead of time*:
  - Paper - one piece per student
  - Writing tools such as crayons, colored pencils, markers

PREPARATION

- Refer to the LiveWell Kids Volunteer Manual on the LiveWell Kids webpage for details about preparing for the lesson one week prior and the day of.
- Since this lesson includes searching for pollinators (e.g., bees), it is **important to check with the teacher about students with allergies**.

SET-UP INSTRUCTIONS

1. SET UP THE INTRODUCTION AREA:
   - Set out the laminate - *The Life Cycle of a Plant*.

2. SET UP THE FLOWER DISSECTION ACTIVITY:
   - Use the knife and cutting board to cut a flower exactly in half and set it on one of the trays.
   - If you have additional flowers, leave them whole and place them around the cut flower.
   - Cut the fruit/pod in half and set on the other tray.
   - Place the box of magnifying lenses, the tweezers, and the laminates: *Flower to Fruit Process* and *Anatomy of a Flower*, next to the trays.

3. SET UP THE PLANT PARTS ACTIVITY:
   - Place the following laminates and books next to the tray:
     - Laminates - *Parts of a Plant, Plant Parts We Eat*
     - Whiteboard
     - Dry-erase marker/s

4. SET UP THE POLLINATION ACTIVITY:
   - Set out the laminate - *Anatomy of a Flower*, and book – *What is Pollination?*

INTRODUCTION & MINDFUL BREATHING (2 MINUTES)

- Introduce yourself and other volunteers.
- Guide students through a mindful breathing exercise.
- Explain: The purpose of this fourth lesson is to learn all about plants. We'll begin with the life cycle of a plant and then talk about the different plant parts – including parts we eat – and finish up with pollination. Plus, we'll get to enjoy some fun activities while we're in the garden today!

	Life Cycle of a Plant[1,2] Supplies: Laminate - *The Life Cycle of a Plant*
Discussion	• Show the laminate, *The Life Cycle of a Plant*. • All plants start out as a tiny seed. • Once the seed is planted in the soil, given water, nutrients, and sun, it grows roots, and sprouts. • The plant grows larger until it is ready to ***reproduce,*** which means to make more plants. • Then it makes flowers that, if pollinated, develop fruit or seed pods.

****Divide Class into Two Groups****

Split the students into two groups. Send one group with your co-volunteer/teacher to the *Plant Parts* activity area, while taking the other group with you to the *Flower Dissection* activity area. Both activities will run simultaneously. Switch groups after 10 minutes.

FLOWER DISSECTION ACTIVITY (10 MINUTES)

Students will learn about the process of pollination and the development of fruits/pods and seeds in this three-part discussion activity.[3]

	Anatomy of a Flower Supplies – Laminate - *Anatomy of a Flower*
Discussion: Part 1	• Inform the students that they will look at the different parts of a flower to understand how pollinators assist in pollination. • Show the *Anatomy of a Flower* laminate and state that flowers have many parts. • Point out the ***anther*.** • The anther is covered with a powdery substance called ***pollen***, which pollinators get all over their bodies when they visit flowers to get nectar and pollen. • When the pollen-covered pollinator moves to another flower, they unknowingly deposit pollen in that flower. • Once the pollen is deposited, the flower can make a fruit/pod. • Fruits/pods contain a plant's seeds.

	Looking Inside a Fresh Cut Flower Supplies – Fresh flower, laminate - *Anatomy of a Flower*
Discussion: Part 2	• Now you're going to refer to the cut flower on the tray and point out the structures that you just talked about. • Use the tweezers to expose or extract the flower parts for better inspection during the discussion. • The parts of the flower are named on the laminate for your reference. • Pass the tray around so the students can get a close look at the fresh flower. • It is important that they just look at (not touch) the flower because it has been cut open and is now very fragile. • If you have multiple flowers, you can leave some uncut so they can gently handle them and look for the structures you're discussing. • Have students find the anthers and stigma on the flowers and imagine the pollinator moving inside that confined space, covering itself in pollen and spreading it around. • Ask the students if they see how the pollinators end up depositing pollen on the stigma because of its central location.

	Flower to Fruit Supplies – Use above supplies plus: cut half of fruit/pod, laminate - *Flower to Fruit*
Discussion: Part 3	• Show students the labeled structures on the *Flower to Fruit Process* laminate and see if they can identify them in the fruit, as well as in the flowers. • Explain that when a flower gets pollinated, part of it will grow into a fruit/pod which contain the seeds inside. • Allow the students to examine the laminates, fruit, and flowers to compare structures, while pointing out the developmental stages.

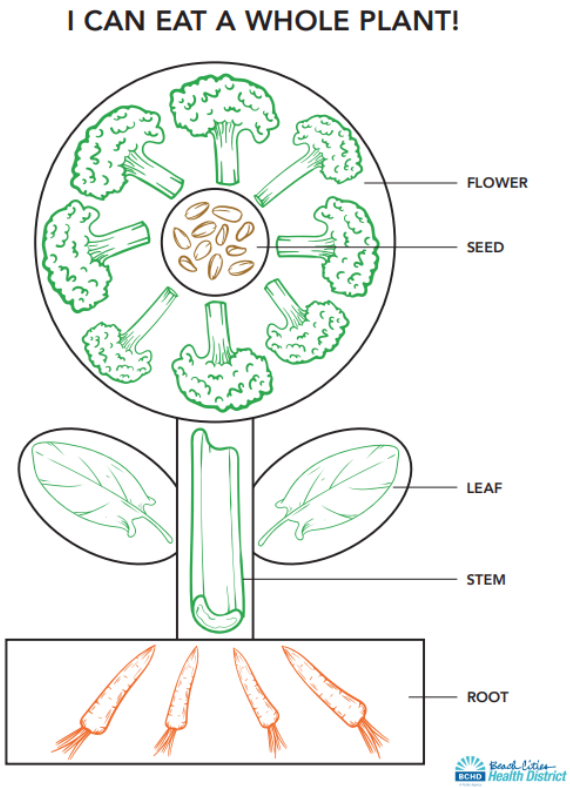
PLANT PARTS ACTIVITY (10 MINUTES)

Happening at the same time as the Flower Dissection activity.

****Inform your students that even though they'll be learning about consuming various parts of plants, not all roots, stems, leaves, flowers, fruits, and seeds are safe to eat! Some can be harmful to people if eaten. Do not eat parts of wild or unknown plants unless they have been informed by a trusted adult that it is safe to eat.*

	I Can Eat a Plant! Supplies: Laminate - *Parts of a Plant, Plant Parts We Eat, Whiteboard and dry-erase marker*

Activity	Discussion:
	• Every day, we eat foods that come from different parts of plants.[4]
	• Share both the *Plant Parts We Eat* laminate and the *Parts of a Plant* laminate.
	• Using the laminates to illustrate, discuss which part of the plant each food is from on the *Plant Parts We Eat* laminate and show where it came from on the *Parts of a Plant* laminate.
	Activity:
	• Using the whiteboard and dry-erase markers, have the students "build" a plant from the roots to the flowers by deciding which food to draw.
	  ○ Ask them to name a root that they eat (either taking turns or deciding as a group.)
	  ○ Draw the food they named on the whiteboard where the roots would go (underground.) For example, if they tell you "Carrot", draw a whole carrot where a root would be under the ground.
	  ○ See example image below.
	  ○ Repeat with each plant part (stem, leaves, flowers, seeds) until the plant they built is complete.
	  ○ If time allows, build a new plant.



__Gather Class Together__

__POLLINATION__ (6 MINUTES)

	__Pollination__[5] Supplies: *Anatomy of a Flower*
__Discussion__	• Once a plant is ready to reproduce, it puts out flowers to attract pollinators. • The flowers contain pollen that needs to move from the anther to the stigma. • Most plants need pollinators to move the pollen from an anther to the stigma. • Examples of pollinators are bees, butterflies, moths and even flies. • Remind them about the earlier discussion about how pollinators move pollen.

	Observing Pollination
Part 1: Observation	__Explain how to be safe around pollinators.__ • Emphasize to the students that since they are going to be up close to some insects that can sting, it is very important that they observe with just their eyes, not touching any of the pollinators. • Let them know that if a stinging pollinator comes near them, they should be still, or step away slowly and calmly. • Don't wave your arms around, as this scares them and gives them a reason to sting!

Part 2: Observation	<u>Walk through the garden and observe pollination</u> • Tell the students that they're now going to walk through the garden and see if they can mindfully observe pollination in action. • This is an activity that they are going to do ALONE. They are "observing," so they'll be paying attention and not talking. It should be very quiet. • Since they are going to get up close to insects, they need to move slowly. • Once they see a pollinator that they want to watch, be still, and stand back. • They can watch to see if they can observe the insect drinking nectar, getting covered in pollen, and moving from flower to flower. • If they see a pollinator land on a flower, have them watch to see if it rubs against the stigma. • Have them pay attention to the sounds that the pollinators make; some are noisy, and some are silent. • Also, have them notice if the flowers they found with a pollinator have a strong smell or not. *<u>If there are no pollinators</u>, discuss different types of pollinators such as butterflies, bees, hummingbirds, and wasps, and how they pollinate flowers. Ask students to be mindful when they are outside to see if they can spot them wherever they see plants.

CLOSING (2 MINUTE)

- Bring students together to close the lesson and thank the students, teacher, and other volunteers.
- Recap the key points of the lesson.
- If you have time, have students draw/write a "Reflection Page" after the lesson, either in the garden or with the teacher when they return to class. If you see any that you'd like to share with BCHD, take photos of their work and email them to mishell.balzer@bchd.org.
- Thank the students for joining you today and dismiss them.

***Don't forget to report your lesson as delivered with the online form!**

Scan this QR code with your phone for scheduling and reporting lessons as delivered:

From the computer, click the link that was emailed to you by your Lead Volunteer:

LiveWell Kids Tracking Links 2024-25

Resources

[1] Bales, Kris. "Introducing Kids to the Plant Life Cycle." ThoughtCo, 16 Oct. 2020, www.thoughtco.com/plant-life-cycle-for-kids-4174447.
"Plant Life Cycles." Penn State Extension, extension.psu.edu/plant-life-cycles.
Plant Life Cycles. (n.d.-b). Penn State Extension. https://extension.psu.edu/plant-life-cycles#:~:text=the%20growing%20season.-

[2] Wallin, L. (n.d.). Eating Plants. Agclassroom.org. Retrieved November 14, 2023, from https://agclassroom.org/matrix/lesson/145/

[3] "7 Brilliant Ways Seeds and Fruits Are Dispersed." *Encyclopedia Britannica*, www.britannica.com/list/falling-far-from-the-tree-7-brilliant-ways-seeds-and-fruits-are-dispersed

[4] The University of Rhode Island. (n.d.). *The Plants We Eat Reference List*. Retrieved November 14, 2023, from https://web.uri.edu/wp-content/uploads/sites/1241/The-Plants-We-Eat-Reference-List.pdf