



Backyard Pollinators: In-Person

Intended Audience: Grades 6-8	Lesson Duration: 1 hour
Lesson Objectives	
Students will be able to: <ul style="list-style-type: none"> ● Understand the basic anatomy of a flowering plant; ● Recognize the relationship between cross-pollinating plants and pollinators; ● Understand the adaptations flowers have adopted to attract specific pollinators; ● Demonstrate comprehension of cross-pollination and botanical reproduction. 	
NGSS Covered: MS-LS1-1, MS-LS1-2, MS-LS1-4, MS-LS1-6, MS-LS2-1, MS-LS3-1 MS-LS4-3, MS-LS4-4	

Introduction: Welcome & Who We Are/What We Do	2 minutes
Lecture: Plant Identification and General Anatomy	10 minutes
Skit: It's All About Pollination	6 minutes
Lecture: Meet the Pollinators	6 minutes
Activity: Pollination Games (3 rotational centers)	30 minutes
Discussion: Circle Up Closing	5 minutes

Program Word Bank: angiosperm, pollination, pollinator, flower, petal, sepal, nectar, pollen, pollen transfer, stem, leaf, stamen, anther, stigma, pistil, ovary, self-pollinated, cross-pollinated, fertilized, anemophilous, hydrophilous, zoophilous, entomophilous, pollinator syndrome, ecological relationships, mutualism, parasitism, commensalism, diurnal, nocturnal, bee, butterfly, wasp, beetle, bird, bat, moth.

Materials

- 1.) Diagrams
 - a.) Flower Reproduction Diagram from ScienceFacts.net
 - b.) Large Crossword Puzzle

- c.) Writing utensil (white board marker)
- d.) Easel
- 2.) Skit
 - a.) Containers (3)
 - b.) Antennae headbands (3) optional
 - c.) Baskets (3)
 - d.) Kid gloves (3 pairs) optional
 - e.) White pom-poms (12)
 - f.) Crushed orange, red, & yellow chalk kept separate (pollen)
 - g.) Bumblebee Photos
 - h.) Seed pods (optional)
- 3.) Common Native Pollinators Photos
- 4.) Interactive Pollinator: Plant Activity
 - a.) Medicine dropper (4)
 - b.) Pipettes (4)
 - c.) Syringe (4)
 - d.) Clothespins with accompanying square of sponge (small enough to fit in clothespin) (4)
 - e.) Various mini containers (old yogurt cups, film canisters, beakers, etc.)
 - f.) Medium sized water tight containers (4) Hives, nest, belly, den
 - g.) Water pitcher to fill flowers
- 5.) Pollinator Matching: Headband Game
 - a.) Photos
 - b.) Question Prompts
 - c.) Pollinator Descriptions
 - d.) [Pollinator Syndrome Chart](#)
 - e.) Stretchy Headbands (6-12)
 - f.) Timers (3-5)
- 6.) Scavenger Hunt
 - a.) Clip board
 - b.) Pencils
 - c.) Printouts

Lesson Instructions

Introduction: Welcome! NH Audubon is committed to protecting NH's natural environment for the wildlife and people that live there. USFWS works with others to conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people.

Topic 1: Plant Identification & General Anatomy

Activity: Plant Part Crossword Diagram. Present the blank plant diagram and ask the kids to raise their hands as you read out the clues. Bring up a volunteer from the audience to help label the accompanying flower parts diagram positioned alongside the crossword puzzle.

Topic 2: It's All About Pollination

Assign three students to be flowers. Offer them empty containers (without lids). Explain to them that as flowers, they must remain planted with strong roots so that they don't spill any pollen or nectar from their holding baskets. Assign a handful of volunteers to deposit 3-5 pom-poms and 10 shakes or a few spoonfuls of their colored powder into one flower (basket/container) explaining that the pom-pom represents nectar and the colored powder represents pollen. Ask the flowers to share what color pollen they received with the class. There should only be ONE color per flower at this stage. Have the flowers shake their basket as though a strong wind had blown by (to ensure the pollen spreads to the pollen).

Assign three students to be bumblebees (antennae headband, carrying basket, kid gloves).

Talk the students through the following skit:

Bumblebees are just one type of the 100+ wild bee species native to NH. They are social bees and live in underground colonies, often making their homes in abandoned mice dens or crevices between the roots of trees. They are diurnal, meaning they sleep at night, and are busy workers during the warm, dry days of spring and summer. Bumblebees eat nectar and pollen that they acquire by visiting flowering plants! Unlike honeybees, bumblebees don't produce honey. Bumblebees are larger than honeybees and covered in fine hairs making them appear fuzzy. They are capable of stinging but rarely do unless bothered or defending their nest. Bumblebees use their robust bodies to gather nectar from flowers that sometimes make it more difficult for smaller pollinators to reach. Their strong wings and buff bodies are capable of not only muscling into tight spaces but vibrating pollen directly out of a flower (tomatoes)- show photos.

Instruct the bees that the sun has risen (hold up the sun and slowly walk in a circle around the group while continuing the skit). Instruct the bees to stretch and warm their bodies in the sun's rays because like all insects, they are cold-blooded and can't generate their own body heat. Then tell them to get to work collecting nectar to bring back to their hive! Their job is to spend the entire day collecting nectar and pollen from the available plant species in their region (from 3-5 miles from their nesting site on average). Typically, but not always, bumblebees will collect from one specific flowering plant before returning to their hive to drop off their goodies rather than mix and match. For some flowers such as daffodils and tomatoes, bumblebees are a perfect fit and for others plants, many different types of pollinators, from bees to butterflies, hummingbirds and wasps, are capable of doing the job.

Have the bumblebees show the class what they collected. Ask the students how many colors they see in the bumblebee basket, on the bumblebee gloves, or attached to the pollen pom poms. Discuss how the pollen has mixed together in the bumblebasket. Ask the flowers to ask if the contents of their container is different from earlier. Inquire as to whether there is any nectar or pollen left. Ask if there is only one color of pollen. Ask if it is the same color they started with. Discuss how pollen from one flower is possibly found inside another. Discuss that the pollen from a plant of the same species transferred to another will start to make a seed! Explain how if the pollen of one species ended up in the flower of another type of species, seed wouldn't be produced because they aren't of the same species. Thank the students for their participation; allot time for questions.

Ask the students if they've ever encountered seeds. Show them the examples on hand and ask if the students have ever eaten seeds. Prompt peas, beans, corn, almonds, pistachios, coconuts. How do seeds develop? Through pollen transfer.

Topic 3: Pollinator Syndromes

Introduce the various pollinators commonly found in the garden using the photographs and attached descriptions. Discuss Pollinator Syndromes using the [chart](#) from [pollinators.org](#).

Rotating Activity Centers: Walk the students through all the activity instructions then divide the class by 3 and send them on their way!

Activity 1: Pollination Relay Race

Introduce the game- Emphasize that since they'll be acting as unique pollinators, they have unique characteristics that enable them to seek nectar from specific plants. Present them with a flower (one of the various containers: narrow, wide, deep, shallow, etc.) and a pollinator (the pipette, medicine dropper, clothspin sponge, syringe) and ask them to determine if this is a one size fits all scenario.

Walk around the 'garden' to observe the flowers to examine their traits. Have students describe them using their newly improved botanical vocabulary. Divvy out the pollinators and give them 3 minutes to buzz around the prop flowers. Have them return to a predetermined location to deposit their nectar: honeybee hive, bumblebee den, hummingbird nest, hornet belly. Let them know they will have to manually squeeze out the sponge. After a set amount of time have them stop and present how much nectar they collected before moving through the flowers as a group and asking who was best suited for each sample.

Activity 2: 10 Questions Pollinator Game

This is a fairly common game so instructions can be limited if the students note that they already know how to play. The goal is that the student will guess which pollinator or plant they have and will be presented with a question key to assist in narrowing it down.

Activity 3: Scavenger Hunt: This is a point system scavenger hunt. Each possible item has a point assigned to it. Students are encouraged to pair up and then have 10 minutes to explore the gardens and seek the listed items before returning to the starting site and tallying up points. If students do not have access to outdoor space or this is a winter activity, they should seek out the NH Audubon website to carry out a simplified interactive exploration of a virtual garden. [Virtual Tour of the NH Audubon McLane Center's Demonstration Pollinator Gardens](#)

Closing: Allot at least 5 minutes to receive feedback from the students regarding the activities. Inquire about lingering questions. Ask what they've learned and what they still want to know.