



## Pollinator Party

Intended Audience: **Grades K-2**

Lesson Duration: 45-60 minutes

### Student Learning Outcomes

Students will be able to:

- Understand the basic anatomy of a flowering plant;
- Recognize the relationship between cross-pollinating plants and pollinators;
- Identify the key features of an insect;
- Demonstrate comprehension of pollination concepts.

NGSS Covered: K-2-LS1-1, K-2-LS1-2, K-2-LS2-1, K-2-LS2-2

Introduction: Welcome & Who We Are/What We Do	2 minutes
Lecture: Plant Identification and General Anatomy	4 minutes
Activity: Seed to Sapling	5 minutes
Skit: It's All About Pollination	10 minutes
Lecture: Meet the Pollinators	5 minutes
Activity: Pollinator Matching Game	10 minutes
Discussion: Share Out Circle	5 minutes
Activity: Scavenger Hunt in the Garden, Field, Meadow.	10 minutes
Discussion: Share Out Circle & Wrap Up	5 minutes

Program Word Bank: pollination, pollinator, flower, nectar, pollen, pollen transfer, root, stem, leaf, petal, seed, fruit, nut, antennae, compound eyes, UV light, bee, butterfly, wasp, beetle, bird, moth, nocturnal, diurnal.

## **Program Notes for Naturalist**

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### Materials:

- 1.) Plant Diagram (root, stem, leaf, flower, fruit, seed)
- 2.) Plant Identification Props
  - a.) Sun-themed flashlight (sunlight)
  - b.) Spray bottle set on mist (water)
  - c.) Shovel (soil)
  - d.) Battery operated fan (air)
- 3.) Red Oak & Acorn Image
- 4.) Skit
  - a.) Antennae headbands (3)
  - b.) Baskets (3)
  - c.) Kid gloves (3 pairs)
  - d.) Daffodil headband (6)
  - e.) Gold pom-poms (12)
  - f.) Crushed orange, red, & yellow chalk (pollen)
  - g.) Bumblebee Photos
  - h.) Seed pods
- 5.) Common Native Plants & Pollinators Photos
  - a.) Individual Images with Descriptions
- 6.) Pollinator Matching Game:
  - a.) Pollinator: Plant “Puzzle Pieces”
- 7.) Scavenger Hunt Printouts or flip books (if outdoors)
- 8.) Pollen Transfer Game
  - a.) Various picker uppers (tongs, chopsticks, clothespins, tweezers, spoons)
  - b.) Various cups and tubes
  - c.) Various sized pom poms (nectar)
  - d.) Laminated flowers (squash flower, lily, cardinal flower, echinacea, dandelion)

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### 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

Select a couple eager students from the audience to represent flowering plants. Ask the remaining students to call out the part of the plant you are pointing to on an accompanying poster-sized diagram. As they say the plant parts, encourage the student to strike a pose to represent that part. Cover roots, stem, leaves, flower, fruit, seeds. Encourage them to mention what a plant requires for

existence (sunlight, soil, water, CO<sub>2</sub>). When you prompt the living conditions, pretend to provide the plants with what the students mention by turning the sun on them, misting them with water, pretending to shovel soil on their feet, blowing them with the fan, moving them apart from one another for adequate space. Thank the students and have them return to their seats. Now that we know the general anatomy of a plant, we will learn how a plant becomes a plant in the first place!

### **Activity:** From Seed to Tree

Have students stand and separate from one another. Explain to them that they are about to be magically transformed into an acorn; more specifically an acorn of a northern red oak. Show tree image. Explain that an acorn is the fruit or nut of an oak tree that contains a seed safely tucked beneath that hard outer layer. Show the acorn image. The little cap atop the nut is what attaches it to the branch and allows nutrients pulled from the roots and sugars from photosynthesis from the leaves to reach it. Encourage the students to “be a nut!” Someone will undoubtedly start goofing off so reel them in with, “Okay now be an acorn!” Encourage them to roll up into a ball to represent the acorn.

Walk between the curled up students while discussing that some acorns, once dropped to the ground in Autumn are instantly covered by windblown leaves, some are relocated by rakes or squirrels, or roll down hills, fall into crevices, or are washed downstream by rivers and streams. Mention that the red oak acorns will rest for the winter wherever it is they land and only when the temperature has warmed and the days have lengthened will they begin to germinate. The seed begins to grow by firstly sprouting a root -instruct them to start unfolding one of their legs. Once the root is firmly submerged in the soil, the stem of the oak tree begins sprouting. Walk them through the stages of growth, encouraging them to control their movements since trees don’t typically grow in a day. Include rain, sun, and wind and mention that some might get eaten by a rodent or a deer before germinating. Go from seed to root to shoot to leaves, and then ask if they think they could produce an acorn the same year they sprouted. Encourage why or why not answers. Explain how a red oak in the forest won’t produce acorns until they’re about fifty years old! Have them sit and note that they know how a plant grows from a seed but how does the plant produce the seed in the first place!?

They do it in one of four ways: tell them (or do charades for) a.) wind (example: oaks), b.) water (some marine grasses) c.) animals (example: hummingbirds and trumpet flowers), or d.) insects (bumblebees, moths, butterflies). Explain that we’ll be focusing on insect pollination today... and that they, the students, are going to help demonstrate how it happens.

### **Skit:** It’s All About Pollination

Assign six students to be daffodils by wearing the headband. Explain to them that as flowers, they must remain planted with strong roots so that they don’t spill any pollen or nectar. Once the headbands are secure, assign a handful of volunteers to deposit 2 pom-poms and 5 shakes of their colored powder into one daffodil cup explaining that the pom-pom represents nectar and the colored powder represents pollen.

Assign 3 students to be bumblebees (antennae headband, gloves, carrying basket)

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.

Once the nectar has been collected, have the daffodils carefully remove their hats and bring them up to the center, lining them up before returning to their seats. Have the bumblebees come up to the stage and hold up their gloved hands. Ask the students what they see (more than one color pollen). Ask the students what they think that means. Have new volunteers look inside the daffodil cups and report out to the group as to what they see, reminding them that before the bumblebees descended on the field there was only one color pollen in each flower. Discuss how the bumblebees' gloves are covered in different colored pollen. Discuss how pollen from one daffodil is now found inside another. Discuss that the pollen from another daffodil now found in the cup of another will start to make a seed! Explain how if the daffodil pollen ended up in another type of flower, like a tulip or a cherry blossom, a 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, peanuts, beans, corn, almonds, pistachios, coconuts. How do seeds develop? Through pollen transfer.

**Activity A:** Pollen transfer relay race. Break the group into two lines and set the tongs and large pom poms on the laminated flowers. 2 colors per flower, each flower across from one another (2 yellow pom poms on one dandelion across from two red pom poms on another dandelion, etc.) to the first three students in each line and have them relay race it across. Keep this simple, it's supposed to be. Ask the kids how it went and send them back to their seats.

## **Topic 2:** Common Plants & Pollinators

Introduce the various pollinators commonly found in the garden using the photographs and attached descriptions. Have the students examine where it is they come into contact with the flower while you prep Activity B.

**Activity B:** Using the same laminated plants, add tubes, cups, and smaller pollen (pom poms) that will require different tools to access. Disperse the other picker upper tools and have the kids try it this time. See if each team (on each flower set) can successfully transfer all of the pollen from one flower to another. Encourage them to try the tools. Ask how it went.

## **Activity C:** Pollinator: Plant Puzzle Match

Hand out the Pollinators; hand out the plants. Have the students try and match them up in an allotted time. Describe how and why these matches work the way they do (adaptations).

## **Activity D:** if applicable

Now that we know how seeds are formed, by transferring pollen from flower to flower of the same species, and we know how seeds grow into plants, and the variety of different pollinators that call NH home... let's go see if we can find the different types of plants and their pollinators here in the garden!

Divide the class into groups of 3-4 and present them with the flipbook scavenger hunt. Explain that they'll have 10 minutes to find their items, encourage them to stay on the paths, alert them to the sound that you'll use to regroup and where to meet, and let them free. Regroup and discuss what they found. Use the following prompts if need be:

- 1.) What did you see?
- 2.) Did you see familiar faces? Were you able to identify any insects?
- 3.) Did the pollinators look the same as one another?
- 4.) Did the pollinators look different from one another?
- 5.) How were they the same/different?
- 6.) Were all the flowers the same size, shape, color?
- 7.) Were they all aromatic?
- 8.) Did you see any other creatures in the garden? What/who?
- 9.) Did anyone see a moth? Why or why not?
- 10.) Did some flowers have more pollinators on them than others?

11.) Did you notice any patterns in the garden?

**Wrap Up/Closing Circle:** Q&A and thanks for coming!