# Protecting Pollinators Classroom Activity: Teacher's Guide

**Grade Level:** 2-12
**Curriculum Connections:** Language Arts, Science, Fine Arts, Math
**Class Time:** 45-60 minutes

**Objectives**

- Students will gain an understanding about what pollinators are and why they are important
- Students will learn about threats to pollinators, especially bees and monarch butterflies, which are in decline
- Students will focus on the threat of habitat loss
- Students will learn about ways they can help protect pollinators

**Materials**

- Paper for garden design
- Colored pencils, crayons, markers etc. for garden design
- Computer for additional information

**Initial Classroom Discussion (to provide background information):**

Vocabulary (in bold): pollinator, habitat, native bees, milkweed, native plant

1. Ask your students if they know what a **pollinator** is.
    a. A pollinator is an animal that transfers pollen between the flowers of a plant allowing it to reproduce
    b. Pollinators don't even know they are helping plants to reproduce and are usually just foraging for nectar and pollen from a plant. Some may even just brush against a flower and carry pollen on its body to another flower.
    c. Pollination can also occur through the transfer of pollen by wind or water

2. Now ask students if they know any examples of animal pollinators
    a. Bees
    b. Butterflies and moths
    c. Bats
    d. Birds
    e. They may know these, but may be surprised to find out that species like wasps, ants, flies, mosquitoes, lizards, and even lemurs are also pollinators

3. Ask students what things are important for animals that are pollinators to have in order to live in a **habitat**?
    a. Plants for food
    b. Water
    c. Clean air
    d. Space

4. Now ask students to think about their neighborhoods. What are they made up of?
    a. Houses
    b. Buildings
    c. Streets
    d. Trees
    e. There are many answers to this question
    f. The focus should be that there is a lot of area of where we live that is devoted to humans and how they need to live, but not a lot of places for pollinators to live
        i. Unfortunately pollinators like bees and the monarch butterfly are in decline in the United States and one of the main reasons is habitat loss, especially loss of the plants that are needed as food

5. Bees
    a. Ask students who likes bees?
    b. Ask why or why not?
    c. Bees are often confused with yellow jackets, which are wasps that are much more aggressive than bees. Bees only sting if they feel threatened.
    d. Also honey bees are not from the United States and were brought over from Europe, while **native bees** like bumble bees, carpenter bees and others are historically from the United States
    e. Showing pictures on the computer or printing them out would be helpful to show the difference between yellow jackets, honey bees, and some native bees- this website provides more information and pictures: https://www.gardeners.com/how-to/yellow-jackets/7700.html
    f. Bees are very important pollinators of the crops we eat and use including apples, almonds, cotton, peaches, strawberries, beans, cherries and may others
    g. Honey bee colonies are decreasing due to habitat loss, use of pesticides, and fungal diseases
    h. Native bees are mostly solitary, which means they live alone and not in a hive or colony like honey bees
        i. They are great pollinators as well and are said to be more efficient than honey bees because they fly faster, stick to one crop and males also pollinate flowers, unlike in honey bees
        ii. Native bees are also in decline due to destruction of habitat and overuse of pesticides

6. Monarch Butterfly
    a. Monarchs are an orange and black butterfly (show picture if possible) that live throughout the United States
    b. Many monarchs migrate every year from Mexico north to the northern Untied States and Canada in the spring and summer to mate and reproduce and then migrate back to Mexico in the winter
    c. Monarch caterpillars only feed on **milkweed** plants, which are in decline due to development and agriculture, as well as the use of herbicides that can kill the plants

d. This is a big reason that monarch butterflies are declining in the United States
e. Their population has declined 90% since 1990
f. Adult monarchs feed on nectar from many types of wildflowers, including milkweeds, and pollinate these beautiful flowers for us to enjoy

7. How can we help bees and monarch butterflies?
    a. Do students have plants in their backyard? What about your school grounds?
    b. A great way we can help them is to plant native plants around our homes and school and not use pesticides
    c. Since students should now know what a native bee is, ask if they can define **native plant**
    d. Native plants historically and naturally occur in an area and tolerate the climate of the local environment. There are many plants that are native to New York including, Long Island.

**Student Activity**

1. In this activity students will design a garden filled with native plants that are important to pollinators (they can do this individually or in small groups)
2. If possible take a walk outside on the school grounds and discuss with the students which areas might be good for a native plant garden. Then students can use this as inspiration for their garden designs.
3. Give each student or group a piece of white 8 1/2 by 11 paper to create their garden map
4. They should also be given a copy of the "Native Flowers for Gardening and Landscaping" PDF, which can be downloaded from the website with the lesson plan
5. Students should look at all of the plants in the document and determine what pollinators would benefit most from them
6. Students should also find information about when the plant blooms, its size, if it grows in sun or shade, and what type of soil it needs
    a. It is important to have a variety of plants that bloom at different times so pollinators have access to flowering plants all season (from spring to fall)
    b. Also an important factor is to design a garden that is visually appealing to the student so they should look at the pictures and decide what looks best to them
    c. The garden should contain multiple plants of the same species to help pollinators travel from plant to plant
7. They can choose any shape for their gardens including a circle, square, rectangle, and irregular shapes. This is a good way to add geometry into the lesson, by having students measure and calculate the perimeter and area of their garden.
8. Students should draw each type of plant in their garden and write the common name of the plant as well as the species name
9. Have the students present their garden maps to the class. Ask them to describe the location of the garden (school or home), what types of pollinators they hope to attract, and why they chose the plants they did
10. Students should take their native garden plans home to share what they learned with their families and encourage them to plant native plants at home to help pollinators! You can also work with your administration to create a native plant garden at your school!

Please contact 311 or email sustain@northhempsteadny.gov if you have any questions or comments about this lesson plan!