Teacher's Guide

Event Details: 3:45 p.m. on Friday, April 24th, 2020 at Ocean Acres Community Center

Theme: Power of Pollinators: From Bees, to Bats, to Butterflies

"Bees underline the reality that we are more, not less, dependent on nature's services in a world of close to seven billion people".

-Achim Steiner, United Nations

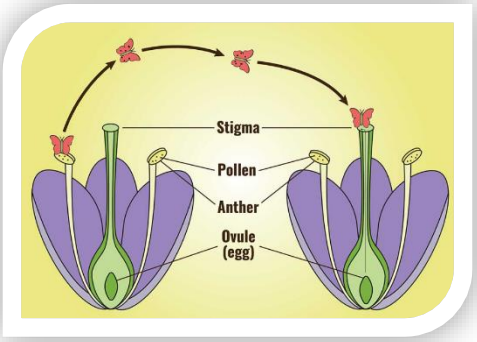
What are pollinators? Why do we need them? How can we help them? Our friends offer more aid to us than we think. We need pollinators in our lives and their importance is not always understood. That's why the Stafford Township's Environmental Commission has dedicated this year's Arbor Day celebration towards enhancing our community's knowledge and understanding of pollinators and their habitats. We present: **Power of Pollinators: From Bees, to Bats, to Butterflies**!

The objective of this teacher's guide is to assist with lessons on:

What are pollinators?

Why are they important?

How can we help?

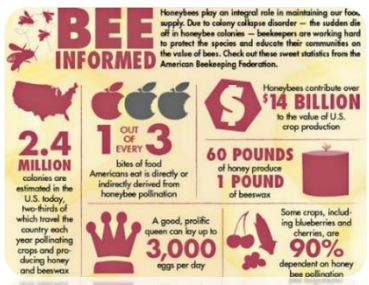


What are Pollinators?

Pollinators help carry pollen from the male part (anther-part of the stamen) of the plant to the female part (stigma). This process allows for fertilization of a plant (tree, shrub, flower, crops, etc.) to take place which aids in the production of fruits and seeds. These fruits and seeds then create an abundance of new plant life. Pollinators consist of an array of different animals such as the thousands of different types of bees, bats, butterflies, moths, birds, beetles, and various other insects.

Why are pollinators important?

Pollinators not only play a vital role in agriculture, they are also the base of the food chain and biodiversity. The natural world around us depends on these "not so understood" creatures. Because a pollinator pollinated that cherry tree in the yard, tent caterpillars are able to thrive, and the chickadee bird is able to feed her young which are nested on the birch tree down the street. They create a whole life cycle for an array of different animals, plants, and even for us humans. The bright yellows, soothing greens, popping purples; the chirping grasshoppers, singing song birds, fluttering butterflies; and the delicious buttery potatoes or scrumptious house salads we enjoy, are here because of the work of a pollinator.



How can we help?

According to a journal article published by Elsevier, “Almost half of the species are rapidly declining and a third are being threatened with extinction”. Habitat change, improper use of pesticides, and pollution, are the main drivers for such declines. A great way to help is by increasing our awareness and understanding of the how the natural environment works. The best way to understand is by connecting ourselves to the outside world by going for hikes and taking a closer look at our gardens or backyards. Another effective strategy for pollinator conservation is by encouraging pollinator abundance and increasing biodiversity. This can be accomplished by making a few changes in our community and back yards such as: planting pollinator and vegetable gardens to create habitat; reduce or eliminate our use of pesticides; plant vegetation that is native to our region; provide nesting habitat by leaving a layer of leaves on the yard; and/or keeping overwintering vegetation in place as pollinators use the stems and other plant parts as a home during the colder months.

Jason Hafstad, a colleague of mine, once said, “We are witnessing a shifting paradigm in backyard landscaping. Traditionally, yards were treated as extensions of one's home, and decisions about species selection was analogous to an interior designer choosing wallpaper. But how we define beauty in our yards is evolving away from color, arrangement, contrast, etc. and more toward biodiversity, ecological function and environmental stewardship. There is beauty in functionality that is much more profound and meaningful than form or appearance”. To bring this to an end, always remember that a few changes made by many has more impact than many changes made by few.

Feel free to contact Monica Zabroski of the Stafford Township Environmental Commission at Mzabroski23@gmail.com for assistance or further information.

Student Activities:

Flower Diagram

Bring two flowers into class. Show the students the flower, naming each of the parts while pointing to them on the flower. Let the children know that pollinators often pick up pollen when they rest on the first flower's stamen. Then when the pollinator travel to the second flower, some of their pollen falls off and rests on that flower's stigma. This is how the flowers are fertilized. Ask the children to show you what they have learned by drawing their own flower diagram, being sure to label each of the flower's parts.

Pollination Demonstration

Younger children often need a visualization of the concept being taught in order to fully grasp it. Demonstrate pollination with a simple activity. Give each child a picture of a flower, or have the children draw a picture of their favorite flower on a sheet of construction paper. Make sure each flower has a circular center. Allow the children to color the center of their flower in with a piece of chalk. Take a cotton ball and tell the children you are the pollinator. Stop by each flower and rub the cotton ball in the center of the flower. Show the children the cotton ball when you finish. They should notice that the pollen (chalk) transferred from the flower onto the bee (cotton ball).

Pollination Relay Race

Separate your students into two even teams. Give each team a bee. The bee can be a puppet, or a picture of a bee glued to a craft stick. Set a bucket 10 feet in front of each team, another bucket 10 feet away from the first bucket and a pretend beehive 10 feet away from the second bucket. Fill the two buckets with circular coins made from construction paper. Half of them must have a "P" written on the top for pollen and the other half "N" for nectar. Instruct the children to line up. One student from each team will go at a time, pretending to be the bee. The students must run to the first bucket, grab a pollen coin and a nectar coin, and head to the second bucket to deposit a pollen coin. Next, the students grab another nectar coin and a new pollen coin and run to the beehive to deposit all of the coins. Students then run back to their teammates and pass the bee off to the next person in line. The team who finishes first wins.

Bio Blitz:

Utilize iNaturalist app or website to identify and record as many species as possible. At the end of the blitz, several weeks to a couple months perhaps, the team with the most records of different species win. Great activity for older students.

Plan and Possibly Plant a Pollinator Garden

https://www.fws.gov/midwest/news/PollinatorGarden.html

Additional Resources:

- Stafford Township Garden Club
- iNaturalist app and website- https://www.inaturalist.org/
- BUGGUIDE.net- https://bugguide.net/node/view/15740
- Native Plant Society of NJ
- NRCS
- NJDEP-Division of Fish and Wildlife
- Pinelands Preservation Alliance
- http://npsnj.org/
- https://www.fws.gov/cno/pdf/HabitatGuideColor.pdf
- US Forest Service
- Jersey Friendly Yards
- https://www.jerseyyards.org/

Pollinator Conservation:

- https://grownativemass.org/Great-Resources/experts-videos/Restoring-Natures-Relationships-at-Home
  Doug Tallamy, caterpillars on native vs. non-native plants, backyard ecology
- https://grownativemass.org/Great-Resources/experts-videos/More-than-Just-the-Buzz?fbclid=IwAR0hPi9-uVWnPPfqhBg9pGEkoI-Vuy-nAKGWS8E-5yUFlxqtRoztdVPGpoc
  Conservation issues around native bees

- https://www.youtube.com/watch?v=HmEARUBEIl4&t=550s
  Effects of honeybees on natural areas (watch from 8:32 to 42:00)

- https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/
  And check out this UN report on the current biodiversity crisis.

Teaching Aides:

- https://www.fs.fed.us/wildflowers/kids/teacher/index.shtml

- **All:**
  https://www.fws.gov/pollinators/PollinatorPages/Outreach.html#partners

- **Bees:**
  https://www.fs.fed.us/wildflowers/pollinators/animals/bees.shtml

- **Bats:**
  https://blog.nwf.org/2014/06/not-just-the-birds-and-bees-6-fast-facts-about-pollinating-bats/?_ga=2.31467646.1900678059.1570562929-1144265050.1570562929
  https://www.nwf.org/Educational-Resources/Wildlife-Guide/Mammals/Bats/Indiana-Bat
  https://www.fs.fed.us/wildflowers/pollinators/animals/bats.shtml

- **Butterflies (Monarchs):**
  https://www.fs.fed.us/wildflowers/pollinators/animals/butterflies.shtml
  Milkweed Seeds for Monarch Butterflies: https://www.livemonarch.com/free-milkweed-seeds/