

GRADES K-2

TIME

One class period, 40-50 minutes

BEEES: The Helpful Heroes



Science



Social Studies

BEE POPULATION

The Children's Museum's lessons are designed to weave classroom experiences and museum education together. All lessons are interdisciplinary and can be used as individual classroom experiences or in combination to create a cohesive unit. Lessons are optimized when used in connection with museum field trips.

Bees are vital to the needs of humans. Bees help pollinate crops across America and throughout the world, which enables fruits and vegetables to grow for our consumption, nourish livestock, and even produce soy products that provide fuel. Students will discover that small actions we take can help maintain, and even grow the bee population.

This is part of a two-lesson series and can be done together or independently.

FOCUS QUESTIONS

- What is a pollinator?
- How do bees help pollinate flowers?
- Why is pollination important to the ecosystem?
- How can we help bees pollinate flowers?



INDIANA ACADEMIC STANDARDS

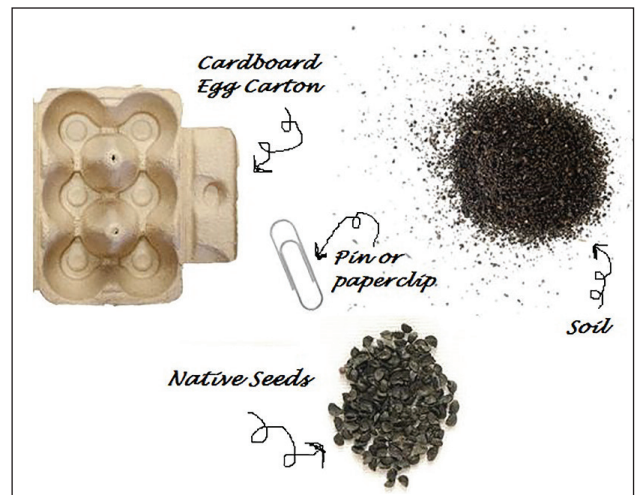
Science: 1.LS.2, 1.LS.3, 1.LS.4

Social Studies: 1.3.9, 1.3.6

OBJECTIVES

Students will:

- Learn about pollinators
- Grow plants that assist pollinators
- Discover the importance of bees to the ecosystem
- Demonstrate understanding of how bees are important pollinators



MATERIALS

- Recyclable egg carton (cardboard is best-avoid Styrofoam and plastic)
- Pin, or item to poke small holes in egg carton
- Native wildflower seeds
- Soil
- Water
- Cookie sheet or tray

Helping the Bee Population

PROCEDURES

1. Ask students about their general thoughts on bees? They may express concern of being stung by a bee or know that bees make honey. Tell students bees have a very important role in our lives.
2. Tell students that one-third of the food we eat is in some way a product of bee pollination. **Pollination** is the process of transferring pollen from flower to flower, allowing fertilization to take place. While pollinating, bees are also gathering **nectar**, the sugary fluid produced by flowers that the bees then use to make honey.
3. Explain to students that the population of bees is declining rapidly. 42% of bee colonies collapsed in the US in 2015.
4. The four reasons bee population is declining are:
 - a. **Pesticides** – Pesticides are chemicals we use on lawns, landscaping, and crops. While they keep away pests that we don't want they can also be harmful to bees.
 - b. **Loss of habitat** - Rural areas are becoming more urban. The loss of greenspaces creates a lack of food and habitat for bees to create their hives.
 - c. **Climate change** – Unusually warm winters have caused a change in the schedule that flowers typically bloom. When bees awake from hibernation their initial food sources have already bloomed and have begun to die.
 - d. **Disease** - Illnesses carried by mites can make bees sick. When the bees become ill, they're more susceptible to pesticide poisoning. Also, pesticides weaken bees' immune systems and make them more susceptible to disease.
5. The collapse of bee colonies puts our food supply at a serious risk but there are ways we can help! Tell students that today they'll be planting their own native wildflowers. A list of **native** wildflowers can be found by zip code at <http://www.nwf.org>.
7. Ask students to think about how they may view bees differently now that they've learned how important they are to our livelihood? This can be share in a class discussion or in an observation journal.



Student Instructions:

1. Begin by cutting rows of the egg cartons leaving two to three connected for each student to use.
2. Using a pin or other small object poke three to five holes in the bottom of each egg section.
3. Begin by filling each hole two-thirds full with soil.
4. Gently place two to three flower seeds on top of the soil in each hole.
5. Add more soil on top of the flower seeds to fill the top third of each hole.
6. Water the soil and place on a tray or cookie sheet, as the biodegradable cardboard will become saturated over the time it takes for the flowers to germinate.
7. Place the tray in a sunny window and watch for the flowers to sprout.
8. Once the flowers have sprouted students can transplant the flowers into an area at their school or home. To do this, separate each individual egg compartment. Gently peel away the outer layer, carefully to not tear the roots. Dig a hole just slightly deeper than the height of the egg container. Place the egg container into the ground and cover with soil, pressing down gently to ensure stability of the new plant.
9. Enjoy watching bees pollinate and gather nectar as your flowers bloom.

Save the Bees

There are many ways you can pitch in to help save bees.

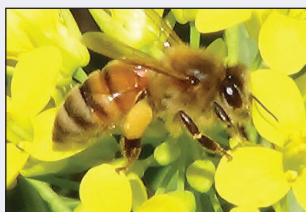
1. Go chemical free in your lawns and gardens by trying natural solutions such as compost.
2. Create a “bee bath”. Help bees find a water source they can land in by filling a tray with pebbles that are slightly taller than the depth of the water.
3. Plant a tree. Blooming trees provides hundreds of blossoms to feed our hungry friends.
4. Become a bee advocate. You may have a friend who is scared of bees, so this is an opportunity to educate them about bees. Remind your family and friends of the importance of bees and share with them things we can do to help bees.

5. Research! Here are some resources:

- <https://www.abfnet.org/>
- <https://thehoneybeeconservancy.org/how-to-save-the-bees/>
- <https://www.nationalgeographic.com.au/history/honey-in-the-pyramids.aspx>
- <https://matteroftrust.org/20-amazing-honey-bee-facts/>
- <https://americanbeejournal.com/>

HONEY BEE COMMUNITIES

A community of bees is referred to as a colony. At peak-population, usually mid-summer, one colony of honey bees can have up to 60,000 resident bees.



The colony is made up of only one queen bee, many worker bees, and a lot of drone bees. The queen is the mother to all bees in the colony and the only fertile female. She can live up to 5 years. A good queen can lay up to 2,500 eggs per day! All worker bees are infertile females. Worker bees live only about 6 weeks. They gather the nectar, guard the hive, feed the queen and drones, and heat and cool the hive. The drone bees are all males and their sole purpose is to mate with the queen. Drone bees do not have a stinger.

VOCABULARY

- Pollinate
- Habitat
- Climate
- Native
- Nectar



HONEY, HONEY

- Honey has been a highly regarded product for thousands of years. It's been discovered through research conducted by the University of Bristol that humans have been using honey for at least 9,000 years. That's as far back as the Stone Age!
- The malleable wax found in hives that holds the honey has been used as integral parts of various tools, in rituals, cosmetics, medicine, as a fuel, and to make receptacles waterproof.
- Honey has antiseptic and medicinal properties as well. It has been used to help with sore throats, digestive issues, skin problems, hay fever, and first aid treatment for minor cuts and burns. The types of sugars found in honey are quickly digested and create a natural boost in energy.

FUN FACTS ABOUT HONEY BEES:

- It takes nectar from approximately two million flowers for honey bees to make one pound of honey!
- Honey bees can fly up to six miles and up to 15 miles per hour.
- Honey bees communicate with one another by dancing. This is called the “waggle dance.” And is done after finding a good source of nectar to share with their friends where the source is located. The dance gives directions by positioning the flower in relation to the sun and the hive.
- Pure honey lasts an incredibly long time. A 3,000-year-old jar of honey was found in an Egyptian tomb and was still considered edible.
- The buzzing sound a bee makes is the bee's wings flapping at an incredibly intense speed. They beat up to 11,400 times per minute.