



Friends of NCTC Program Activity
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Pollinator Pathways
(ages 5 and older)

Background

One of the things that scientists are wondering about right now is why there are fewer pollinators around. Pollinators are animals that help scatter pollen from flower to flower. Flowers need the pollen to make seeds. All of our food (and food for animals) come from seeds so if there aren't pollinators, what will we eat?!

Pollinators live everywhere except where it's too cold for plants to grow. Pollinators include bees, butterflies, moths, bats, flies, hummingbirds, ants, wasps, beetles, and other animals too like monkeys, possums, and lizards. (Pollen can be moved by wind, but not very well so animals are the best way that plants are pollinated.) When pollinators visit a flower, they scatter the pollen from one flower to other flowers. That gives the flowers everything they need to form seeds like fruit, vegetables, etc.

The Cabbage White Butterfly is very common. (The male has one spot on its wing, the female has two). The Zebra Swallowtail Butterfly is black and white, The Monarch Butterfly is one of the best known and tastes bad, so most birds and other animals leave it alone. The Viceroy Butterfly has adapted its color so it looks like the Monarch, but it doesn't taste bad. Both butterflies and moths hatch from eggs to caterpillars. One very common caterpillar is one we call the Woolly Worm. It becomes the Isabella Tiger Moth. Butterflies form a chrysalis, moths form a cocoon. When butterflies rest, they put their wings up on their back. Moths keep their wings straight out.

What You Will Need for This Project

Artificial flowers (lilies are preferred) -- available at Dollar Stores
Cups or bowls for "flowers"
Fuzzy pom-poms (any colors, but 5 colors are preferred)
Drinking straws
Velcro squares or dots (available at places like WalMart or fabric stores)
Paper
Colored pencils or crayons
Echinacea (coneflower), Aster, and Coreopsis seeds (available at WalMart or home and garden stores)
Small planting pots
Planting soil
Bamboo pieces
String or cord
Metal Coffee Can (optional)

Things to Do

Think about all the foods there are to eat in the grocery store. There are usually lots of fruits and vegetables in the front of the store. How many of those depend on pollinators?

Apple	Apricot	Avocado	Berries	Cherries	Oranges
Kiwi	Peaches	Pears	Pumpkin	Broccoli	Peanuts
Squash	Celery	Onions	Peas	Cucumbers	Tomatoes
Cinnamon	Mint	Mustard	Almonds	Coconuts	
Sunflower Seeds	Blueberries	Mangos	Strawberries	Coffee	

Chocolate
Carrots

Bananas

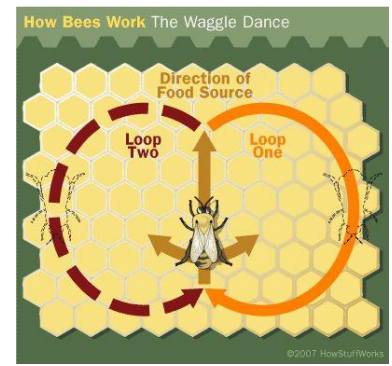
Cashews

Walnuts

All of them do! Pollinators are essential to the foods we eat, even if we never see them at work.

What Do Pollinators Do With Flowers?

Look at a flower or use artificial ones like lily flowers. Can you identify the petals, stalk, leaves? Then look inside. The parts of the flower that are thin with yellow on the end are the parts of the flower that have the pollen (called the “anther”). The pollen comes off easily so when a pollinator brushes up against the anther, some of the pollen sticks on its body. When it goes to another plant, the pollen gets transferred to that flower. That lets the flower make seeds.



Our Most Famous Pollinators Do The Bee Dance

Honeybees are important pollinators and have a unique way of communicating with their hive to tell other bees where a good source of pollen is. They perform a dance that tells the other bees the direction and distance to a good food source.

When a scout bee finds a good batch of flowers, she (all scout bees are female) returns to the hive to tell the others where to go. They don't just follow her. She climbs the beeswax comb inside the hive and dances in a figure-8 motion.

The waggle moves to the right and then to the left to form the figure-8. The “waggle run” (the straight part of between the 2 circles) shows the angle where the food is located relative to the sun. If she moves up the honeycomb, the direction is to the sun. If she moves down the comb, the direction is away from the sun.

How long she wiggles her body tells the bees how far they must fly. Each second of wiggling means a certain distance. Scientists aren't positive how distance is measured, but if 1 second equals 1 mile and she wiggles for 3 seconds it would be 3 miles!

How fast and loud the bee moves also tells the hive how rich the food source is. If the dance is very fast and loud the bees know it's a great place to go—maybe a meadow with flowers in full bloom! (From *Bee Dance* by Rick Chrustowski). Try it yourself! Waggle in a figure-8, first in one direction and then the other.

Pollinator Game

First, make a “pollen collector” (drinking straw with Velcro on one end) for each player. Take a plastic drinking straw and wrap a small sticky square of Velcro (the hook part, not the fuzzy) on one end. This will help you “catch” the “pollen.”

Put “flowers” (cups) around the playing area. In each cup, put fuzzy pom-poms (ex: red, blue, yellow) in each cup. Also in each cup, put purple and green pom-poms. At one end of the playing area, put a “bee hive.”

Each player has a “pollen collector” and will go from flower to flower spreading the pollen. One player will stay at the bee hive. Player go to a flower, pick out a pollen pom-pom, and take it to another flower of that color (yellow to yellow, blue to blue, etc.) If a purple or green pollen pom-pom is collected, the bee returns to the hive, does the bee dance, and gives their pollen collector to one of the bees there. That bee then flies to other flowers. The hive bees remain at the hive until another bee arrives with pollen.

Keep playing until all the green and purple hive pollen is collected or you tire of the game.

Advertise Your Yard!

Pollinators are always looking for a good source of pollen, so we can help by planting flowers that they are attracted to. Of course, pollinators don't read, but it's fun to create a travel brochure or flyer to advertise your schoolyard or your own yard to a bee, a Monarch butterfly, or even a bat. What is special about your yard that would a pollinator? What kind of food do you offer? Is there water? Is there shelter to protect them at night? Are there predators around or is it safe? Take a plain piece of paper and use colored pencils or crayons to create your flyer/brochure. A single side of the paper will make a poster. If you fold it in half or in thirds, you will have a brochure format.

Or make a Pollinator Field Guide to help you identify pollinators you may see. Gather a collection of photos of pollinators frequently found in your area. This can be done in a number of different ways:

You can **Take your own pictures** in your own garden or community garden, a nature center, or a park. The more plants in bloom, the more pollinators you will be likely to find. **Search online** for photos that are free to use for personal use such as <https://www.fs.fed.us/wildflowers/pollinators/> or <https://www.pollinator.org/guides>

Clip photos from magazines or old books or Draw your own. Make a card for each pollinator using an index card or piece of cardstock (any size) or use a small notebook. Attach the photo at the top and then add a few fun facts about the pollinator, such as favorite kinds of flowers/plants to visit or details about their life cycle. If possible, you may want to include additional pictures of what they look like in each stage of their life cycle, especially if they experience complete metamorphosis. You may want to have your cards laminated or you can also cover them with clear contact paper or enclose in a plastic sandwich bag. Punch a hole in one corner and then attach the cards together with a metal binder ring.

Take the new Pollinator Field Guide on your next nature walk. Keep adding more cards as you discover new pollinators!

<https://kidsgardening.org/resources/garden-activities-pollinator-field-guide/#instructions>

Build a Mason Bee House

Mason bees are solitary bees (they don't live in hives) that are typically about half the size of a honey bee. Unlike the honey bee, the mason bee is friendly and they rarely sting, so there will be no issues if you invite them into your garden as a pollinating agent. Indeed, when it comes to their efficiency in pollination, mason bees are even more efficient than honey bees. You can buy a mason bee house online, but it's fun to build one out of pieces of bamboo! Gather bamboo and cut the smaller ends into about 6" lengths. You will need 15 to 20 pieces. Securely tie them together using string so that the pieces will not slip out. (You could glue the bamboo lengths together too, before tying them together or even better, put the bamboo sections in a coffee can! Make sure that there is a way to tie the house in a place that is out of the direct sun. Mason bees will eventually find your "bee hotel."

Plant a Pollinator Garden

The best time to plant a pollinator garden was last year, but it is never too late! You just may have to wait for the flowers to grow and attract pollinators. Echinacea (coneflower), Aster, and Coreopsis are all easy to grow and will come back year after year. Add dirt to the pot, place a seed or two on top, and lightly cover them with soil, and water them. Place the pot near a window for good sunlight. Water the seeds when the top of the soil is dry (don't drown them!) and wait for them to grow. When they are large enough, you can plant them in your yard, keep them watered, and watch them grow. When they blossom, pollinators will find the flowers!

Helpful Hints for Adults (books to read, other websites, links)

For complete instructions on creating a pollinator field guide

<https://kidsgardening.org/resources/garden-activities-pollinator-field-guide/#instructions>

Mason Bee Houses: Dry bamboo is the best for making these houses, but it can easily split if cut after it is dried. By cutting green bamboo and letting the pieces dry for several weeks, you will have better results.

<https://www.buncombmastergardener.org/kids-post-give-mason-bees-helping-hand-build-bee-hotel/>

Are You A Bee? by Judy Allen

Are You A Butterfly? by Judy Allen

Bee Dance by Rick Chrustowski

On Meadowview Street by Henry Cole

Animal Pollinators by Jennifer Boothroyd

Attracting Native Pollinators by The Xerces Society (for high school and adults)