ATLANTA BOTANICAL GARDEN

At Home Science!
Pollinators

This science observation can be done at your home. Learn about the important pollinators in your neighborhood.

Watch How Here

What You'll Need:

- Cleaned empty aluminum can
- Newspaper
- String
- Tape
- Scissors

Background Information:

What are pollinators? It's easy to remember: pollinators pollinate. (say that 5 times fast) Pollination is the process of moving pollen from one plant to another. This is very important because pollination is how plants are able to make seeds to grow new plants. But because plants can't get up and walk to another plant to trade pollen, they need the help of pollinators. This is a mutualistic partnership, because both the plants and pollinators benefit from this interaction. Pollinators come in many shapes, sizes, and species. What types of pollinators might you see in your neighborhood?

Bees- One of the most recognizable pollinators! There are thousands of species of bees from honey bees, to bumble bees to carpenter bees. Bees drink the sweet nectar from flowers. Like honey nectar is very sweet, but only a few special species of bees have the ability to make honey from nectar inside their beehives. Bees have fuzzy little bodies which help them collect pollen. As they fly to another flower to drink more nectar, some of the pollen on their body falls off onto the next flower. Bees are responsible for pollinating nearly ⅓ of our favorite fruits and vegetables like blueberries, almonds, strawberries, apples, and so much more.

Butterflies- Beyond just being beautiful, butterflies are important pollinators as well. Like bees, they drink nectar from flowers collecting pollen on their bodies that get transferred as they move from flower to flower.

Birds- Yes even birds can be pollinators! Hummingbirds are very special types of pollinators. They are attracted to the color red, and have long tongues to help them drink nectar from flowers. While they drink, the pollen dusts the bird's head which transfers from flower to flower.

Other pollinators: ants, moths, flies, wasps, slugs, and snails.

Getting Started:

Did you know not all bees live in bee hives? There are thousands of species of bees, and though some bees live in colonies like honey bees and bumblebees, others are solitary and live by themselves. Carpenter bees are an example of a solitary bee. They build nests just for themselves and their young. For this activity, you'll build a bee house to shelter solitary bees. Remember, we don't have to be afraid of bees! Bees are actually very gentle.They don't want to hurt you, in fact they are there to help you by pollinating our favorite foods and flowers. Just like any animal, if you leave them alone they won't hurt you.

<u>Building your Bee Hotel</u>

1. Gather all your materials. Make sure your tin can is clean and dry. Remove the outer label.

2. If you'd like, you can decorate your container before starting. Bees particularly like the color purple, blue, white, and yellow.

3. Cut your newspaper into wide strips. Each newspaper page should give you about 8 strips.

4. Roll each strip into a long tube, long enough to fit the can.

5. Continue until your can is full of tubes. Each tube will be a room for a bee in your hotel.

6. Tie a string around your can so you can hang it up outside, or find a cozy nook for it. Try to find a location in a covered area at least 3ft from the ground. Wherever you place it, make sure it is secure and won't fall or move too much in the wind.

7. Wait and watch your bees check in!

Diving Deeper:

Pollinator Life Cycles

The life cycle of a honeybee is fascinating and in some ways similar to a butterfly. Number the following pictures in order of the stages of their life cycle.

Bee Life Cycle (number in order)

Larva

Larva eat and eat and grow and grow from food fed by nurse bees

Adult

Adult bees have many jobs. Worker bees pollinate.

Egg

The queen lays thousands of eggs in their cells

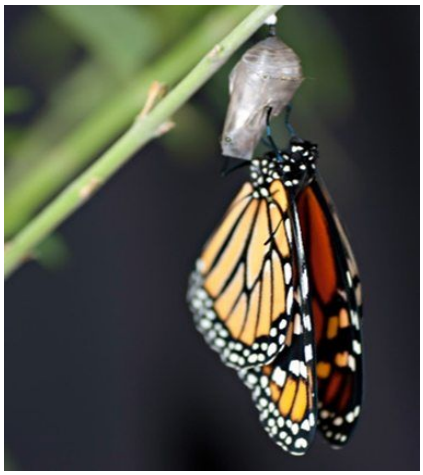
Pupa

Pupa are in a their cells growing their body and wings

Butterfly Life Cycle (number in order)

Pupa (Chrysalis) In this stage, the butterfly forms a chrysalis to develop their wings and body

Egg: Butterflies lay their eggs on the underside of a leaf



Butterfly: Adult butterflies help pollinate many types of flowers and fruits

Caterpillar: Caterpillars much on leaves to grow big and prepare for their metamorphosis into a butterfly

Pollinator Survey

In your yard or in a safe space outdoors, find a patch of flowers to conduct a pollinator survey. On a piece of paper, list the pollinators you think you'd see in this habitat (for example: bee, butterfly, bird). Choose a flower to observe for one minute. During the minute, record what type and how many pollinators visited that flower. Place a tally mark next to the name of the pollinator each time one visits your flower. Repeat for a few more flowers, taking note if some types of flowers get more visitors than others. Which flowers were the most popular?

Native vs. Nonnative Plants

Having native plants in an ecosystem is important in helping attract pollinators. Unfortunately, some pollinators like bees are becoming endangered because of habitat loss, pesticide use, and homogenous ecosystems with only one or two types of plants. To help pollinators, we can plant native plants! Based on the descriptions, match the native plants to their picture. See if you recognize any of these native plants in your neighborhood or around your home.

Goldenrod This plant gets its name for the vibrant yellow colors of its flowers. Often found on the edges of forests and in open fields, this plant has a long stem. The flowers grow in tight clusters	1. 
Coneflower This flower is identifiable by its lavender colored petals that droop down below the spiny center of the plant.	2. 
Dandelion Even though many consider this a weed, dandelion is actually a favorite among pollinators and has many helpful uses for humans as well. The bright yellow flowers bloom into a white tipped poof of seeds that blow away easily in the wind.	3. 
Daisy Recognizable by it's small white flowers and yellow center, this sweet smelling flower can grow up to 3 feet.	4. 
Red Clover Though the name says "red", this flower actually has a purplish hue. You may have also seen this flower in white. It's petals are small, long, and tubular, and the flower grows on a bed of leaves shaped like a spade ♤	5. 

Answers: Bee Life Cycle: 1. Egg 2.Larva 3.Pupa 4.Adult Bee ; Butterfly Life Cycle: 1. Egg 2.Caterpillar 3.Pupa (Chrysalis) 4. Butterfly; Native Flowers: 1. Coneflower 2.Daisy 3.Red Clover 4.Dandelion 5. Goldenrod

Additional Resources:

Bee Life Cycle Time Lapse
Like Fruit? Thank a Bee
How Honeybees Make Honey
Georgia Pollinators
Pollination Vocabulary
Bats as Pollinators
Monarch Butterflies
How to Help Pollinators

Standards Covered

SKL2. Obtain, evaluate, and communicate information to compare the similarities and differences in groups of organisms.

a. Construct an argument supported by evidence for how animals can be grouped according to their features.

S2L1. Obtain, evaluate, and communicate information about the life cycles of different living organisms.

a. Ask questions to determine the sequence of the life cycle of common animals in your area: a mammal such as a cat, dog or classroom pet, a bird such as a chicken, an amphibian such as a frog, and an insect such as a butterfly.

c. Construct an explanation of an animal's role in dispersing seeds or in the pollination of plants.

d. Develop models to illustrate the unique and diverse life cycles of organisms other than humans.

S3L1. Obtain, evaluate, and communicate information about the similarities and differences between plants, animals, and habitats found within geographic regions (Blue Ridge Mountains, Piedmont, Coastal Plains, Valley and Ridge, and Appalachian Plateau) of Georgia.

a. Ask questions to differentiate between plants, animals, and habitats found within Georgia's geographic regions.

S7L4. Obtain, evaluate, and communicate information to examine the interdependence of organisms with one another and their environments.

a. Construct an explanation for the patterns of interactions observed in different ecosystems in terms of the relationships among and between organisms and abiotic components of the ecosystem. (Clarification statement: The interactions include, but are not limited to, predator-prey relationships, competition, mutualism, parasitism, and commensalism.)

SBO3. Obtain, evaluate, and communicate information to describe Georgia's major physiographic ecoregions, their representative natural plant communities, and their conservation.

b. Construct an argument based on evidence of the impact of non-native invasive plants on Georgia's natural communities.

. d. Design a solution to create sustainable plant communities within Georgia's ecoregions and reduce negative human impact. (Clarification statement: Solutions

SBO6. Obtain, evaluate, and communicate information to analyze the economic and ecological importance of plants in human society.

b. Develop a model to explain how plants impact the environment by providing diverse habitats for birds, insects, and other wildlife in ecosystems.

SEN1. Obtain, evaluate, and communicate information about the roles of insects in ecosystems.

b. Ask questions to compare and contrast the prevalence of specific insect species in local Georgia regions.

d. Construct an explanation of the importance of insects in ecosystem sustainability (e.g., plant pollination, decomposers/recyclers of organic matter).

SEN3. Obtain, evaluate, and communicate information about the impact of insects on the production of food and other products and in popular culture and commerce.

b. Construct an argument based on evidence to demonstrate the importance of an insect's ecological niche in food production and food sources (e.g., pollinators of agricultural crops, human protein source, biomass pyramid).