STEM ACTIVITY OF THE WEEK

HUDSON RIVER PK

DIY Butterfly Feeder

Theme: Pollination; Native Species, Life Cycles
Ages: 5-12 years old
Prep Time: 5 minutes
Activity Time: 60 minutes

Activity Summary:
Butterflies support our ecosystem due to their ability to pollinate plants! This lesson breaks down the butterfly pollination process, inviting students to observe how butterflies move pollen between plants. Students will create a butterfly feeder to encourage butterflies to visit their homes, while observing any other species it may attract. For an introduction to butterflies, check out our STEM Activity of the Week: Life of a Butterfly.

Objectives:

- Students will observe and describe the feeding activity of butterflies, insects and other species
- Students will describe the importance of pollinators and their role in the ecosystem

Experiment Materials:

- Slice of orange
- Pipe cleaners (opt for vibrant colors that are most likely to attract butterflies, such as pinks, reds, yellows, oranges and blues)
- 1 wooden skewer
- Tape or glue
- Hole puncher
- Scissors
- Food coloring (optional)
- Plastic cup (24 oz) or plastic container from your recycling bin (i.e. empty peanut butter jar)
- Jute twine or yarn (optional)
- Sponge or cotton balls
- Silk/artificial flowers or cut paper petals

Simple Syrup (Sugar Water) Materials:

Note: this requires adult supervision, if you do not want to make simple syrup you can buy a bottle of simple syrup

- 1 tablespoon of sugar
- 9 tablespoons of water
- Saucepan/pot to boil ingredients

Lesson Procedure: Butterfly Feeder and Pollination

1- Background Information: Pollination

The life cycle of plants depends on **pollination** as it allows for plants to make seeds and continue reproduction. Pollination is the process of pollen grains being transferred to the male anther of a flower to the female stigma. **Pollen** are tiny grains produced by the stamens of flowers that fertilize the seeds. First, a pollen grain falls onto the stigma. Second, the insect enters the flower and brushes against the anther coating itself in pollen. Third, some pollen may fall onto the stigma as the insect leaves the flower. Fourth, the insect continues this process from flower to flower. Fifth, a small seed forms in the ovary of the plant.

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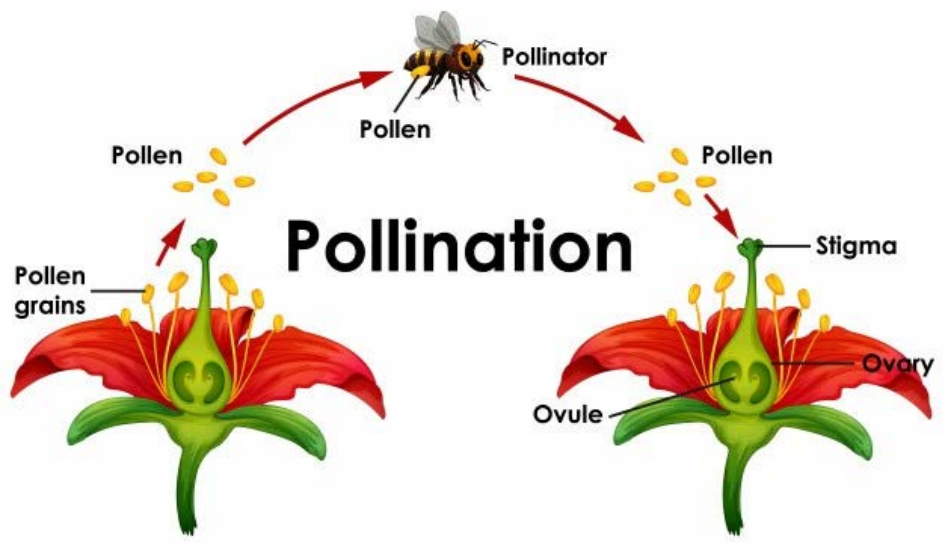


Pollination can occur with the help of many insects, but also with the help of the wind or rain. Wind or rain can carry the pollen from flower to flower, but the weather will always vary. Since wind or rain is not a reliable source of pollination, insect pollinators are essential to carry out pollination and maintain a balanced ecosystem. Butterfly pollination begins as butterflies pick up pollen on their bodies when they travel from flower to flower. Butterflies tend to travel longer distances thus ensuring sufficient coverage of equal portions of flowering plants in larger flower bed areas.

Butterflies are an important part of our ecosystem as they are one of nature's many pollinators. Butterflies are among one of the most common pollinators, followed by bees, wasps, moths, beetles, and more. Butterflies typically visit clustered flowers that are flat as they provide a landing pad that allows for simpler nectar probing. **Nectar** is a sugar-rich liquid secreted by plants (primarily flowers) which ultimately attracts butterflies and other insects that pollinate the flowers. Butterflies have a weak sense of smell, however they have a complex color vision that allows them to see ultraviolet or colors within the red spectrum. This is why butterflies typically visit clustered flowers that are brightly colored (red, orange, yellow).

2- Flower Anatomy:

Flowers are made up of a variety of different parts. Some flowers may have all male parts, all female parts or a combination of both parts!

Male parts: the **stamen** is a key indicator of a male part of a flower. It is composed of two parts:

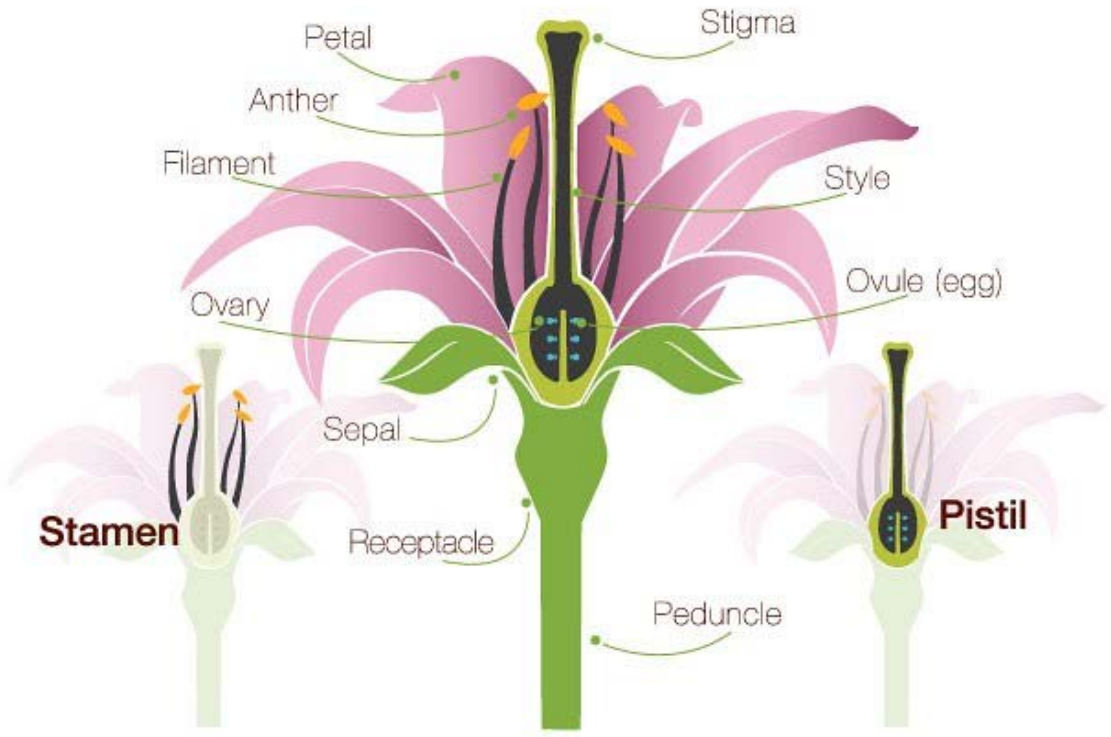
- **Anther** produces pollen (male gamete) that is typically yellow in color
- **Filament** holds up the anthers

Female parts: the **pistil** is a key indicator of a female part of a flower. It is composed of three parts:

- **Stigma** catches grains of pollen
- **Style** holds up the stigma
- **Ovule** (egg or female gametes)
- **Ovary** contains the ovules

Other parts that make up the structure of a flower:

- **Petals** are colorful parts of the flower that attract pollinators
- **Sepals** are specialized green petal-like leaves for protecting unopened buds
- **Receptacle** holds floral organs attached at the axis (stem) of the plant
- **Peduncle** or stem of the flower



3- DIY Butterfly Feeder

Educator Note: To understand the role of our pollinators, we are going to create a butterfly feeder and observe the different species we can attract. Please take notes and make observations about which insects/small animals your butterfly feeder will attract.

Simple Syrup (Sugar Water) Instructions:

Safety Note: Adult supervision is needed to create your sugar water

1. With adult supervision, combine 9 parts (9 tablespoons) water and 1 part (1 tablespoon) sugar in a small saucepan and bring to a boil.
2. Allow to boil for 2 to 3 minutes until the sugar is completely dissolved.
3. Have an adult remove the pan from the heat and allow the syrup to cool completely.
4. While you wait for the syrup to cool, follow the instructions to prepare either a stationary butterfly feeder or a hanging butterfly feeder. (See below)

Stationary Butterfly Feeder Instructions:

1. Clean your plastic cup or plastic jar and make sure there is no wrapping around the container.
2. Add the cooled simple syrup (or store bought simple syrup) one tablespoon at a time until the sponge or cotton balls are completely saturated. (*Make sure to reserve a small amount!*)
3. *Optional Step*: Add a few droplets of food coloring to help make the sponge or cotton balls more attractive to butterflies.
4. Add the saturated sponge/cotton balls to the bottom of the plastic cup or container.
5. Pour the reserved amount of simple syrup onto the orange slice.
6. Push the orange slice on the tip of the wooden skewer and place it in the plastic cup or container.
7. Fill your plastic cup or container with some artificial flowers or tape /glue on paper petals.
8. Place the butterfly feeder outside: in a garden, on a flowerpot, outside your window or on a fire escape.

9. Change the orange slice every 3-4 days.
10. Observe what insects/animals your butterfly feeder is attracting!

Hanging Butterfly Feeder Instructions:

1. Clean your plastic cup and make sure there is no wrapping around the can.
2. With adult supervision, carefully use a scissor or holepuncher to create two small holes (directly across from one another) along the top edge of the plastic cup. If using a plastic container it is recommended to use a hole puncher instead. (*Be careful not to break your cup!*)

3. Cut two pieces of jute twine/yarn (or whichever material you want to hang your feeder with) to a length to 16-20 inches each.
4. Thread a piece of twine/yarn through one hole and tie both ends at the top. Repeat this for the other hole. This should make a loop that will allow the plastic cup or container to hang.
5. Add the cooled simple syrup (or store bought simple syrup) one tablespoon at a time until the sponge or cotton balls are completely saturated. (*Make sure to reserve a small amount!*)
6. Add the saturated sponge/cotton balls to the bottom of the plastic cup or container.
7. Pour the reserved amount of simple syrup onto the orange slice.
8. Push the orange slice on the tip of the wooden skewer and place it in the plastic cup or container.
9. Fill your plastic cup or container with some artificial flowers.
10. Hang the butterfly feeder in a garden, on a tree branch, on a flowerpot or outside your window. It will work best if placed about 6 six inches higher than flowers or 3 feet down from a tree branch.

11. Change the orange slice every 3-4 days.
12. Observe what insects/animals your butterfly feeder is attracting!

4- Post-Experiment Wrap Up and Questions

Now to wrap up and test how much you've learned, please use your observations to answer the following questions:

1. Why did we use an orange slice and simple syrup (sugar water)? *(What do butterflies eat AKA what is nectar?)*
2. Based on your observations of the butterfly feeder, what animals/insects did it attract? How many of each species did it attract?
3. Can you explain the importance of pollinators in nature?

Over the course of this experiment, we created a butterfly feeder and observed the different insects and small animals we were able to attract. Butterflies and other insects are important pollinators that assist in the life cycle of many plants. We hope this activity helped you learn about butterflies and the process of pollination and to continue protecting natural resources like the Hudson River!