

# Pollinator Exploration Experiment

## Duration: 30 minutes

Note: Use "Pollinator Musical Chairs" resource after experiment for an extended lesson plan

**Objective:** To prepare students for their field trip to Tudor Place by introducing the idea of pollinators. Students will model pollination through a hands-on experiment and comparison.

#### **NGSS Standards Met:**

2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

LS2.A: Interdependent Relationships in Ecosystems

- Plants depend on water and light to grow. (2-LS2-1)
- Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)
- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-LS2-1)
- Make observations (firsthand or from media) to collect data which can be used to make comparisons. (2-LS4-1)
- Systems in the natural and designed world have parts that work together. (K-ESS2-2),(K-ESS3-1)
- Plants and animals can change their environment. (K-ESS2-2)

LS4.D: Biodiversity and Humans

• Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)

#### Materials Needed:

"Pollen": Cheese dust from mac n cheese, glitter or sand

• Optimal: A bunch of different color powders

"Flowers": Craft resource printout on paper plate, or paper plate with flowers drawn on Pipe cleaners, cut in half (2 halves per student) Straws, cut in half (1/2 straw per student)

• *Option*: Could also use popsicle stick or rolled up paper, anything that the "pollen" won't stick to well.

Tape (1 piece / student) Scissors *Option*: butterfly wing craft resource (1/2 sheet per student)

# Step One: Brainstorm

- Prompt students to recall the parts of plants and the things they need to grow.
  - o Plant Parts: Roots, stem/trunk, leaves, branches, flowers, seed, fruit
  - o Plant Needs: Water, sun, water, place to live/soil, air
- Key question: How do more plants grow?
  - o From seeds
- Secondary question: How do plants make seeds?
  - Explain that flowers use pollen to make seeds.
  - Pollen must get from one part of the plant to another.
  - Plants cannot do this on their own.
  - Animals that move pollen from one plant to another are called *pollinators.* 
    - Do you know any animals that are pollinators?
      - Bees, wasps, moths, butterflies, birds
  - After plants are pollinated, they grow fruit or seed pods.
    - If a plant is not pollinated, it cannot grow seeds/fruit.

# Step Two: Experiment

## Setting up the Experiment:

- Place one print-out flower on a paper plate (or draw flowers on paper plates).
- Place roughly one teaspoon of powder/glitter on the center of each flower to be "pollen".
- Select a number of flowers appropriate for your class size: four to six students per table.
  - *Optimal:* A bunch of different color sands or glitters. (one color per plate) Colorful would be best!



## Butterfly Craft:

- While you are setting up tables, have students spend five to ten minutes coloring and assembling their two butterflies for the experiment.
  - Each student will receive two butterfly outlines from below (or drawing paper), half a pipe cleaner (chenille stem), half a straw and one piece of tape.
- 1. Color butterflies and cut them out.





2. For pipe cleaner butterfly, place pipe cleaner under the butterfly, with the colored side face up. For the straw butterfly, simply tape the straw to the bottom of the butterfly.





3. Wrap the pipe cleaner around the center section, creating a handhold to use during the experiment



#### Conducting the Experiment:

- Break students up into an appropriate number of groups for your class age and size, roughly four to six students per group.
- At each station, students will land each butterfly on the flower to "drink" nectar.
- Have students take turns trying both of their butterflies at each flower, dipping the face and body into the powder gently.
- Connect the rotation to the fact butterflies are hungry. They need more food, so they go find a new flower to drink nectar from.
- Rotate groups between tables every one to two minutes and repeat until students are at their original table.



# Post-Experiment Brainstorm

- Ask students what they noticed or learned during the experiment.
  - Which butterfly was better and picking up pollen?
  - Have students look at their butterflies. Which one has more pollen (powder)?
    - The pipe cleaner should have much more powder on it.
- Which one do you think is more like an actual butterfly then?
  - The pipe cleaner.
  - Show image of pollinator legs. *Example images below*.
    - Pollinator legs have little hairs that trap all the pollen, making them really good at spreading the pollen around.
- What would happen if we took away the flowers? Or if we took away the pollinator?
  - Encourage students to think about how plants and pollinators need each other. If you take away the pollinator, the plants can't grow. But if there are no plants, then the pollinators have no food. They both need each other. This is called *interdependence*.

## If using multiple colored powders:

- Have students look at the pollen on the plates and on the butterflies.
  - Is it one color or a bunch of colors? (Should be multiple colors)
  - Explain to students that this is how new plants grow. When pollen from different plants mix, they make new plants, which is very important.

#### Pollinator Leg image citations

- <u>https://www.natgeokids.com/uk/primary-resource/the-buzz-about-bees/</u> bee in flight
- <u>https://www.nationalgeographic.com/animals/invertebrates/facts/honeybee</u> bee on purple flower and bee face close up
- <u>https://butterflycircle.blogspot.com/2019/03/the-butterfly-legs.html</u> butterfly leg

#### Glossary

**Ecosystem:** All of the living and non-living things in an environment.

**Interdependence:** When plants and animals need each other to survive.

**Pollinator**: An organism that moves pollen from one plant to another, helping to fertilize the plant and create seeds.











