



Pollinators Pass It On

Title: Pollinators Pass It On

Estimated Time: 1 Period

Core Ideas (GSE Standards):

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

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

S1L1. Obtain, evaluate, and communicate information about the basic needs of plants and animals.

a. Develop models to identify the parts of a plant—root, stem, leaf, and flower.

b. Ask questions to compare and contrast the basic needs of plants (air, water, light, and nutrients) and animals (air, water, food, and shelter).

c. Design a solution to ensure that a plant or animal has all of its needs met.

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

b. Plan and carry out an investigation of the life cycle of a plant by growing a plant from a seed and by recording changes over a period of time.

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

Science and Engineering Practices:

Asking Questions and Defining Problems:

Ask questions that arise from careful observation of phenomena, models, or unexpected results, to clarify and/or seek additional information.

Constructing Explanations and Designing Solutions

Construct an explanation that includes qualitative or quantitative relationships between variables that predict(s) and/or describe(s) phenomena.

Crosscutting Concepts

Structure and Function

Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used.

Authentic Scenario

In this phenomena, students investigate the beneficial relationship between bees (and other insects) and flowering plants. The flowers of plants provide bees with nectar and pollen to feed their colonies. Meanwhile, bees provide flowers with the means to reproduce by spreading pollen from one flower to another. The process of moving pollen from flower to flower is called pollination, and it allows for seeds and fruit to be produced so that the next generation of plants can grow.

Guiding Question:

Can you model the process of pollination using simple materials?

5E Stage	Student Activities How will students engage actively in the three dimensions throughout the lesson?	Teacher Activities How will the teacher facilitate and monitor student learning?
Engage	<ul style="list-style-type: none"> • Students consider why bees are frequently found buzzing around flowering plants. • Students generate questions based on their previous observations of bees around flowers. • Students consider why the relationship between them might be beneficial to both the bees and the flowers . 	<ul style="list-style-type: none"> • Encourage students to generate questions. • Discuss other beneficial, or mutualistic, relationships between living things.
Explore	<ul style="list-style-type: none"> • In the exploration, students begin by drawing and coloring a couple of flowers. The flowering plants should include a stem, roots, leaves, and at least one flower with colorful petals to attract the bees. • Using pipe cleaners, the students create as simple model of a bee that can be used to transport pollen between flowers. Students can develop their own model or create one using the following format: <ol style="list-style-type: none"> 1. Wrap a yellow pipe cleaner in a spiral ½ the length of the cleaner to form the head of the bee. 2. Wrap the other ½ piece of pipe cleaner around the end of a pencil to form the body. 3. Cut a black pipe cleaner in half. Set aside. 4. Add the other black half around the pencil to form the stripes of the bee. 4. Use another pipe cleaner to form the wings of the bee. Attach them to the body. 5. Optional: Use the remaining pieces of pipe cleaner to make legs and/or antennae for the bee. 6. Add a little salt, pepper, or sugar to one of your flowers to serve as pollen. 7. Move the bee from one flower to the next and see how the pollen is transferred. 	<ul style="list-style-type: none"> • As needed, assist students in the drawing and coloring of their flowers. • As needed, help students to build the model of their bee. • As needed, model the pollination process to show how pollen is transferred.
Explain	<ul style="list-style-type: none"> • Students use their observations to explain/diagram what they think is happening between the bee and the flowers. • Students share ideas for how bees and flowers are designed to make this process as efficient as possible. • Students read/research information by reading <i>Bees and Flowers Benefit Each Other</i>, and/or researching on their own. 	<ul style="list-style-type: none"> • As needed, reiterate to students that one important skill of scientists is to construct explanations based on observations. • As needed, read aloud the close read and emphasize key terms and ideas.

	<ul style="list-style-type: none"> • Students revise/improve their explanation of how bees and flowers benefit each other based on their reading and research. • Students discuss whether their pipe cleaner bee and paper flowers represented a model that was useful. 	<ul style="list-style-type: none"> • Discuss the importance of modeling as a technique to gain understanding.
Elaborate	Students should	
Evaluate	<p>Formative: Each student presents their revised/improved model of how pollination occurs and explains why is beneficial for both the bees and flowering plants.</p> <p>Summative: Each group presents their revised/improved model of how pollination occurs and explains why is beneficial for both the bees and flowering plants.</p> <p>Students complete journal entries documenting observations, data, discussions, and conclusions.</p>	<p>Formative: Facilitate ongoing questioning & discussion</p> <p>Promote discussion of diagrams/models and explanations.</p> <p>Summative: Evaluate group presentations</p> <p>Evaluate journal entries.</p>

Teacher Notes: It really helps to watch the short YouTube Video of this activity. This activity is great because it covers animals, plants, their interrelationships, and the super important process of pollination. The pipe cleaners are super easy for even young kids to bend and the pencils provide a simple template for building bee bodies. As always, encourage your out of the box kids to create their own bees. The “sticky” texture of pipe cleaners make them perfect to transfer pollen from one flower the other. While yellow and black make great colors to construct the bee, it works just fine to use other color combinations.



Materials needed per student:

- 1 yellow pipe cleaner
- 2 black pipe cleaners
- 1 additional pipe cleaner
- Pencil
- Scissors
- Paper for flowers.
- Crayons or markers.