
Dialogue Between a Plant and a Pollinator

Activity Overview

Students learn about the intricate and essential relationship between pollinators and the plants they pollinate.

Objectives

Students will:

- Observe insect pollination
- Consider what is happening to both the plant and insect

Subjects

Science, Language Arts and Math

Grade

3 through 12

Activity Time

20 minutes for observation, 20-40 for discussion and data compiling, 30 for writing exercise

Season

Late spring through early fall

Materials

Clipboards, pencils, paper, stop watch per group, field guides

State Standards

Science:

Discover how organisms meet their needs (F.4.1)

Investigate how organisms respond to internal/external cues (F.4.2)

Investigate structure & function of organisms (F.8.1)

Show organism's adaptations (F.8.2)

Language Arts:

Use effective reading strategies (A.4.1, 8.1,A.12.1)

Read, interpret, and critically analyze literature (A.4.2, A8.2,A.12.2)

Read & discuss texts to understand human experience (A.4.3, A.8.3,A1.12.3)

Read to acquire information (A.4.4, A.8.4,A.12.4)

Background

There is a very special relationship that exists between a plant and its pollinator. One must be adapted for the other in order to make every interaction as efficient as possible. Insects spend a lot of energy and time foraging for nectar and unless they are efficient they will spend more energy looking for nectar than feeding on it. In order to survive, pollinating insects have developed what is called an “Optimal Foraging Strategy.”

This strategy includes visiting only those flowers that have a large amount of nectar. The most profitable flowers for insects haven't been visited recently by other feeders, are currently producing maximum nectar, and/or regularly produce high quantities of nectar. These flowers are considered “hot,” while flowers with little or no nectar are considered “cold.” It is not certain how insects know which plants are “optimal.” It is clear through observing insects that they do have a strategy for success. This activity may give students some insights to an insect's “Optimal Foraging Strategy.”

Activity Description

1. First divide into groups. Each group picks a plant or pollinator to observe in the restoration area.
2. Take clipboards, paper, pencils plus one stop watch/timer per group.
3. Give each group member a task (some may have to share a task if groups are large). Tasks include counting the different kinds of insects that visit a plant, recording the insect's activity, noting if the plant is in bloom or not, and timing how long an insect feeds on nectar. If an insect does not appear to obtain nectar record it an “unsuccessful visit.”
4. Another option is for the group to follow a pollinator. Use the same materials and count how many plants the pollinator lands on, time how long a pollinator visits a plant or individual flower, estimate the distance the insect travels and take note of it's route. If a butterfly is followed, form a large group in order to spread out and not loose the pollinator.
5. During the activity keep these questions in mind: What is the insect doing and why?; What does the plant get from this interaction?; and What are the costs and benefits to the insect and the plant from this interaction?
6. As a class, compile data onto a classroom chart. Use this information and observations to write a creative, imaginary dialogue between a pollinator and a plant.

Dialogue Between a Plant and a Pollinator (cont.)

Create or produce writing (B.4.1, B.8.1, B.12.1)
Plan, revise, edit, & publish writing (B.4.2, B.8.2, B.12.2)
Understand forms, structures, & punctuation marks (B.4.3, B.8.3, B.12.3)
Conduct then communicate research (F.4.1, F.8.1, F.12.1)

Math:

Use reasoning abilities (A.4.1, A.8.1, A.12.1)
Communicate mathematical ideas (A.4.2), logical arguments (A.8.2, A.12.2)
Connect mathematical learning with other subjects (A.4.3)
Use vocabulary, symbols, notation (A.4.4)
Explain solutions to problems (A.4.5)
Analyze non-routine problems (A.8.3)
Develop effective oral & written presentations (A.8.4)
Explain mathematical concepts, procedures, & ideas (A.8.5)
Recognize & describe measurable attributes & units (D.4.1)
Demonstrate understanding of measurement (D.4.2)
Read & interpret measuring instruments (D.4.3)
Determine measurements by using standard tools (D.4.4)
Determine measurements by using basic relationships or estimations (D.4.5)
Identify & describe attributes in situations not directly or easily measurable (D.8.1)
Demonstrate understanding of measurement facts, principles, techniques (D.8.2)
Determine measurement directly by using standard units (D.8.3)
Determine measurement indirectly (D.8.4)

Source

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Extensions

- Determine whether pollinators feed more frequently at different times of the day or if feeding varies based on weather conditions.
- Develop a seasonal phenology of insects visiting plants throughout a season.
- Compare data collected between a restoration site and manicured lawn.

Additional Resources

- Hoff, Mary King. (2003). *Pollination*. Creative Education.
- Carrer, Chiara and Francesca Grazzini. (1996). *Flower, why do you smell so nice (I want to know)*. Kane/Miller Book Publishers; 1 Amer edition.
- Johnson, Sylvia A. and Yuko Sato. (1991). *Roses red, Violets blue: Why flowers have colors*. Lerner Publishing Group.
- Oda, Hidetomo. (1986). *Insects and flowers*. Heinemann Library.

Assessments

- Analyze the class data and hypothesize how insects can tell if a flower is optimal.
- Write briefly why pollinators choose certain plants over others.
- Describe an interaction between a plant and pollinator scientifically using poetry.
- Write a cost benefit analysis for a pollinator and plant.

