



May 2007

Busy Bees and Butterflies

Developed By: Terra Chaney

Adapted From:

1. Kraft, Jesse 2006. *Pollination Parties!* Discovery Education.
Available at: <<http://school.discovery.com/lessonplans/programs/tlc-butterflies/>>
(Last access 3/6/07).
2. Gordon, Jules. *Pollination*. West Eugene Wetlands Educators Guide.

Grade Level: 4th and 5th

Time: 45minutes

Overview:

This lesson introduces participants to the concept of pollination and the role of pollinators in plant reproduction. The activity provides students with tools to help them identify specific pollinators, how they find flowers, and the connection between pollinators and plants.

Oregon Benchmarks Addressed:

Life Science-

- a. Diversity and Interrelationships. Benchmark 2: SC.05.2.C.1(1)
- b. Organisms. Benchmark 2: SC.05.2.A.1(6)

Learning Objective:

By the end of this lesson, participants will be able to:

1. Describe the concept of pollination
2. Explain the ways pollinators find flowers
3. Understand the connection between pollinators and plants

Required Reading: none

Materials Needed:

- UV picture of how bees see flowers
- Pictures of bees and butterflies landing on flowers, possibly drinking nectar
- Half a class set of index cards with bees and butterflies on them
- Half a class set of index cards with various flowers on them

See sample pictures and websites at the end of lesson plan for ideas.

Background:**Pollinator Facts:**

There are about 4,000 native pollinator species in North America today.

Nearly 350 species of native bees lived in the West Eugene Wetlands about 200 years ago.

Currently, there are less than 100 species found there.

All flowering plants must be pollinated in order to reproduce. About 80% of these plants need the help of animals for pollination and the other 20% rely on wind.

Only bees and a few wasps deliberately gather pollen, the other insects are only interested in the nectar within the flower.

Definitions:

Nectar: A sweet liquid that is secreted by the plant and is the raw material of honey.

Context: Nectar gives flowers their sweet smell

Pollination: The transfer of pollen from one plant to another. Specifically from the anther to the stigma in angiosperms, flowering plants.

Context: Bees and butterflies transfer pollen between plants when they drink nectar helping the plants reproduce.

Activity Description:

Before the class session create the cards and posters for the activity. One half of the class will need a card with a pollinator on it and the other half will need a card with a flower on it.

Step 1. Getting Started: Introductions

This lesson plan will cover the topic of pollination and the animals that are involved.

Step 2. Discussion of Pollination and Pollinators

1. Ask class if they know what pollination means. If not, define pollination as the movement of pollen from one flower to another.
2. Ask class if they know what pollen is. If not, describe pollen as the key for the plant reproduction. Without pollen, a flower's seeds would not form.
3. Ask students which animals they believe are pollinators. Answers to be discussed: bees and butterflies. Other answers: Flies, beetles and bats.
4. Q: Why do pollinators visit flowers? A: To drink nectar and gather pollen, both food sources.
5. Describe how pollen gets stuck to the bees and butterflies when they drink the nectar from flowers. When the bees and butterflies visit another flower, the pollen that is stuck to them transfers to the new flower allowing for the plant to begin reproduction. Some species of bees gather pollen and put it in pollen baskets on their back legs.
6. Describe two wetland flowering plants.
 - a. Queen Anne's lace can be found at the wetlands along the bike path and in the wetlands themselves. Also known as wild carrot, Queen Anne's lace has a bitter carrot type root and small white flowers. These flowers attract short tongue bees that can easily drink nectar from these flowers.

- b. Describe the special relationship between Kincaid's lupine and Fender's Blue butterfly. The butterfly depends on the lupine for a place to lay its eggs. The lupine also provides a food source for developing fender's larva.

1. Queen Anne's Lace/Wild Carrot



2. Kincaid's Lupine



1. <http://www.mta.ca/~rthompso/nativeflora/calycifloraelecture/20QueenAnne'sLace.JPG>
2. http://www.ubcbotanicalgarden.org/potd/lupinus_sulphureus_kincaidii.jpg

7. Discuss how bees and butterflies find flowers.
 - a. Ask students to list the senses they use when looking for things. Projected answers: sight, hearing, touch.
 - b. Ask students how they think bees and butterflies find flowers. Anticipated answers: smell, sight.

Answer to be discussed: Bees see differently than people do. They see the patterns on flowers as brightly colored landing strips. (Show class picture of how a bee sees flowers). Butterflies also find flowers by sight. They are attracted to brightly colored flowers, especially red. The sweet smell of nectar also attracts insects to the flowers.
8. Ask class: "If there are bees and butterflies how do they all find nectar to eat?"

Projected answers: many flowers in the area, flowers have a lot of nectar.

Answer to be discussed: Flowers hold their nectar in different places. Bees cannot reach the nectar that is far inside the flowers but butterflies can because they have long tongues. These animals have different adaptation to collect nectar from flowers allowing them to be more capable of obtaining nectar from specific flowers.

Step 3. Pollination Activity

1. Hand out cards with pollinators and flowers. Give half of the class pollinators and half of the class flowers. One card to each student.
2. Have student look at their cards. If they are a pollinator, have them find a flower. If they are flowers, have they stand in place and wait for a pollinator to come to them.
3. Have pairs discuss what their pollinator is and how it interacts with the flower they are given.

Questions for discussion:

- a. What is their pollinator?
- b. How will their pollinator find flowers?
- c. Are there any problems that their pollinator may have with the flower on their card?
- d. Does their pollinator have any advantages over other pollinators when collecting nectar from this flower?

4. Group Discussion

Bring the group together and ask student pairs to share their cards and the answers to their discussion questions. If there is any confusion about the role of pollinators or adaptations, ask the class to clarify. If they cannot, clarify the roles for the class.

Step 4. Gauging Understanding

Discusses the following questions with the class:

1. What is pollination?
Answer: the transfer of pollen from one plant to another.
2. Why is pollination important to plants?
Answer: It moves the pollen which allows for plant reproduction
3. What insects are the most common pollinators in Oregon?
Answers: Bees, butterflies, and beetles
4. What type of flowers can butterflies drink nectar from but bees cannot? Answer: flowers with deep nectar pockets.
5. How do butterflies find flowers?
Answer: By sight, attracted to brightly colored flowers, and smell of the nectar.

Step 5. Wrap Up

Bees and butterflies are important to plants because they move pollen between flowers. Plants provide food, nectar, to pollinators. Plants and pollinators will continue work together which will ensure their survival. It is important to remember that without bees some flowers would no longer exist. Using alternative to bug spray may help save these important insects.

Additional Reading/Resources:

1. Cole, Joanna 1998. The Magic School Bus: Inside a Beehive. Scholastic Press

Join Mrs. Frizzle and her class as they visit the inside of a beehive! Watch her students become busy worker bees who participate in all the hive activities: gathering and storing honey, caring for the larva bees, and following a swarm of bees as they establish a new hive.

2. All about Butterflies

<www.enchantedlearning.com/subjects/butterfly/allabout>

Enchanted Learning provides educational tools to students covering a wide variety of topics. This site provides students with pictures of, and data on, butterflies. Topics include anatomy of butterflies, various species, and the differences between moths and butterflies are described.

3. Nature: Alien Empire

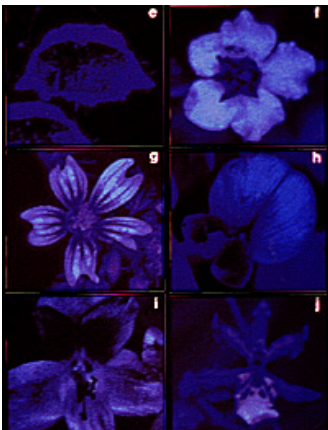
<<http://www.pbs.org/wnet/nature/alienempire/multimedia/bee.html>>

This PBS Online site has a diagram of a worker bee and describes the different body parts and functions.

1. How bees see flowers:



2. How bees see flowers:



3. How humans see flowers:



4.



5.



6.

7.



1. <http://www.mir.com.my/rb/photography/windows/images/eddieUVblue.jpg>
2. <http://gears.tucson.ars.ag.gov/ic/vision/flowers-uv.jpg>
3. <http://gears.tucson.ars.ag.gov/ic/vision/flowers-vis.jpg>
4. http://www.wmconnolley.org.uk/bees/DSCN6624-bee-close_1200x1200.JPG
5. http://www.genhanson.com/photos/otherbugs/honeybee_020505_026b.jpg
6. <http://www.hiltonpond.org/images/DogfaceSouthern01.jpg>
7. <http://instruct1.cit.cornell.edu/courses/icb344/abstracts/images/fenders-blue.jpg>