
Pollinator Partners

Activity



Purpose:

The purpose is for students to understand the interdependent relationship between plants and pollinators. Students should be able to explain why pollinators are important for plants.

Objectives:

Students will explain the mutualistic relationship between plants and pollinators, including one benefit for each.

Students will identify three plant adaptations that are used to attract various pollinators.

Materials:

Included in Kit:

- Pollinator Memory Matching Game with Directions and Answer Key (8 student sets)
- Pollinator Partners Cards (2 sets)
- Pollinator Partners Answer Key
- Book: The Reason for a Flower

Not Included in Kit:

- Individual student white boards or blank paper

Time Required: 75 min

Appropriate grades: 2-5

NGSS and Common Core Standards:

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 animals for pollination or to move their seeds around.

3-LS1-1 Develop models that describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Activity:

Introduction 20 min.	<ol style="list-style-type: none">1. Begin by reading students the book “The Reason For Flowers”2. Lead discussion about plant mutualism with pollinators.<ol style="list-style-type: none">a. Lead discussion about plant mutualism with pollinators.<ol style="list-style-type: none">i. Ask: How do plants reproduce?ii. Pollination: A necessary step in the reproduction of flowering plants; the process by which pollen is transferred from the male stamen to the female stigma, thereby enabling fertilization and sexual reproduction.iii. Pollinator: An animal (e.g. insect, bat) that involuntarily transfers a flower’s pollen from male reproductive organs to female reproductive organs.iv. Mutualism: A special type of symbiosis where both species benefit from the relationship. (two thumbs up)v. Can a plant reproduce without being pollinated? Why not?
Body 45 min.	<p>Exploration: Pollinator Partners</p> <p>Teacher note: There are only 16 cards in each set. With more than 16 students use part of the second deck. Make sure to pick out matches from the second set so everyone has a partner by the end of the activity.</p> <ol style="list-style-type: none">1. Give each student one of the Pollinator Partner cards. The cards consist of descriptions of pollinators and descriptions of flowers.2. Explain that each student is either a flower or a pollinator. The object of the activity is to find your match (one flower per pollinator in this activity). The flowers rely on a specific pollinator to help spread their pollen in order for the reproduction of the flower to occur.3. Students with flower cards will stay in one place. Students with pollinator cards will move from flower to flower seeking the flower types described on their own card. Pollinator students will ask the flower students questions to see if they can pollinate that flower. For example, the hummingbird would ask the flower, “Are you a red tubular flower?” If the flower says “yes” then the two students match and sit down.4. After students have found their match, the pair will draw a picture of what they think the flower looks like on a white board based on the description of the card. They will also come up with a hypothesis for why they think their pollinator is able to pollinate that specific flower.5. Give students 5-10 minutes to complete this activity



6. After all students have found their pollinator partner, have students share out with the rest of the class their hypothesis of why they think their pollinator is able to pollinate this specific flower.

Explain:

1. Who can describe the mutualism between plants and pollinators? What benefit do the plants take from this relationship? What about the pollinators?
2. Name all the animals (plus an abiotic source!) that can pollinate flowers. What flower adaptations attract each type of pollinator? (*Make a chart on the board with students of the pollinators and the traits they look for in the plants they pollinate - chart in background information doc*)
3. What are some ways plants are adapted to attract different pollinators? - May need to define adaptation.
4. In this game each flower only has one specific pollinator. Do you think that this is the case in real life? Have you ever seen a bee and a butterfly land on the same flower? Explain that flowers can be pollinated by multiple pollinators.
5. We looked at some interactions where plants are highly adapted, or “specialized”, to a specific pollinator. What are advantages to this? Disadvantages?
6. Many of the cards from Pollinator Partners were native plants. Does anyone know what a native plant is? Why are native plants important for pollinators?

Apply:

Break students up into groups of 2-4.

1. Students will play the Pollinator Memory Matching Game.
2. Students will follow the directions for the game pairing a pollinator with a flower that it pollinates.

Directions: (*Directions are also found in each game set*)

1. Students will break up into groups of 3 or 4. Lay out matching cards upside down, so the photos are hidden.
2. Students will take turns turning over two cards, trying to find a flower and its matching pollinator. Clues are provided on each flower card.
3. When a pair is flipped over, students can discuss if these would be a good match. Why or why not?
4. If the cards they turn over don't match, they have to turn them upside down again, but remember their location.
5. When students find a match, they may keep that pair. Whoever gets the most matching pairs wins the game.



<p>Closure 5 min.</p>	<ol style="list-style-type: none"> 1. Pair-Share: Choose one pollinator and plant from the lesson today. How do they both benefit from this mutualistic relationship? 2. How can you help plants and pollinators? How can you support the native plants that grow in Southern Oregon? 3. Optional: Watch 3 min Pollinator Video from Cornell’s Naturalist Outreach to give context: https://www.youtube.com/watch?v=Lu7AjOvznh8 (take-away: pollination is trading food for fertilization) 4. How does pollination help you?
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Modifications:

- **Middle School:** For older children, the children’s books can be skipped, or more age appropriate books can be found. Another way to make the game more challenging is having them describe each plant in the game without using the direct words on the card. Go into more depth on the advantages and disadvantages of plants being specialized to only one pollinator. In the Pollinator Memory Matching game, when students get a matching pair, they will need to explain to their group why their pair is a good match.
- **High School:** Optional extensions are to design a pollinator garden and research specific native plants and their pollinators in Southern Oregon. Another extension for either middle school or high school is to talk about buzz pollination. An example of this is manzanita which flowers in the winter and has fused waxy petals so that the pollen doesn’t wash away in the rain. However, bees cannot get into the openings. Instead bees land on them, disengage their flight muscles, buzz until the sound reaches a middle C in pitch and then the pollen explode out and gets on the bee.

Glossary:

Pollinator: An animal (e.g. insect, bat) that involuntarily transfers a flower’s pollen from male reproductive organs to female reproductive organs.

Pollination: A necessary step in the reproduction of flowering plants; the process by which pollen is transferred from the male stamen to the female stigma, thereby enabling fertilization and sexual reproduction.

Mutualism: A special type of symbiosis where both species benefit from the relationship.

Adaptation: a living organism’s physical/behavioral features that aid it in surviving within a specific habitat

Native Plant: A plant that occurs naturally in a particular region, ecosystem, or habitat without human introduction.

