Swallowtail Butterfly

Life Science | Lesson Guide

2nd Grade

Photo Description

A beautiful butterfly with black wings and yellow spots is sitting on a pink flower. The butterfly is using its long, thin tongue to drink sweet nectar from the flower's center. The flower has bright pink petals around a yellow middle part.

Scientific Phenomena

This image captures the Anchoring Phenomenon of pollination - a mutualistic relationship between flowering plants and pollinators. The butterfly is feeding on nectar (a sugar-rich reward produced by the flower) while inadvertently picking up pollen grains on its body. When the butterfly visits the next flower, some of this pollen will transfer to the new flower's reproductive parts, enabling plant reproduction. This co-evolutionary relationship benefits both organisms: the butterfly receives food energy, and the plant achieves sexual reproduction through pollen transfer.

Core Science Concepts

1. Animal Needs and Survival: Butterflies need food (nectar) to survive and get energy to fly, grow, and reproduce.

2. Plant Reproduction: Flowers make nectar to attract animals that will help move pollen from one flower to another.

3. Interdependence: The butterfly and flower help each other - the butterfly gets food and the flower gets help making seeds.

4. Animal Structures and Functions: The butterfly's long proboscis (tongue) is perfectly designed to reach deep into flowers to drink nectar.

Pedagogical Tip:

Use hand motions to help students remember the pollination process: have them pretend to be butterflies "drinking" from flowers while "pollen" (yellow powder or confetti) sticks to their arms, then "fly" to another flower to transfer it.

UDL Suggestions:

Provide multiple ways for students to demonstrate understanding: drawing the pollination process, acting it out with props, or creating a simple comic strip showing the butterfly and flower interaction.

Zoom In / Zoom Out

Zoom In: At the microscopic level, tiny pollen grains are sticking to the butterfly's fuzzy body parts, legs, and antennae. These pollen grains contain male plant cells that will combine with female plant cells to create seeds.

Zoom Out: This single butterfly-flower interaction is part of a larger ecosystem where many different pollinators (bees, butterflies, birds, bats) visit thousands of flowers, helping entire plant communities reproduce and create food webs that support all living things.

Discussion Questions

1. What do you notice about the butterfly's mouth parts and how might they help it get food? (Bloom's: Analyze | DOK: 2)
2. How do you think the flower and butterfly help each other? (Bloom's: Understand | DOK: 2)
3. What might happen to the flowers if all the butterflies disappeared from this area? (Bloom's: Evaluate | DOK: 3)
4. How is a butterfly's tongue similar to and different from a straw? (Bloom's: Analyze | DOK: 2)

Potential Student Misconceptions

1. Misconception: "The butterfly is eating the flower."
   Clarification: The butterfly is only drinking liquid nectar from inside the flower, not eating or damaging the flower parts.
2. Misconception: "Flowers make nectar just to be nice to butterflies."
   Clarification: Flowers make nectar as a "payment" to attract animals that will help them reproduce by moving pollen.
3. Misconception: "All insects hurt plants."
   Clarification: Many insects like butterflies, bees, and beetles actually help plants by moving pollen between flowers.

NGSS Connections

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

Disciplinary Core Ideas:
- 2-LS2.A - Animals depend on plants for food
- 2-LS4.D - There are many different kinds of living things in different areas

Crosscutting Concepts:
- Structure and Function - The butterfly's proboscis structure allows it to function as a nectar-drinking tool
- Systems and System Models - The pollination system shows how living things interact

Science Vocabulary

* Nectar: Sweet liquid that flowers make to attract animals like butterflies and bees.
* Pollen: Tiny yellow powder made by flowers that helps plants make seeds.
* Pollination: When pollen moves from one flower to another flower to help make seeds.
* Proboscis: The long, tube-like tongue that butterflies use to drink nectar.
* Petals: The colorful parts of a flower that attract pollinators.

External Resources

Children's Books:
- The Magic School Bus Plants Seeds by Joanna Cole
- From Seed to Plant by Gail Gibbons

- The Reason for a Flower by Ruth Heller

YouTube Videos:
- "Pollination for Kids" - Simple explanation of how bees and butterflies help flowers make seeds (https://www.youtube.com/watch?v=2_Q9Hb9kN2M)
- "Butterfly Life Cycle" by National Geographic Kids - Shows how butterflies grow and develop (https://www.youtube.com/watch?v=LKrwOdqsj5U)