

Photo Description



A butterfly with black wings and yellow spots sits on a pink flower. The butterfly is using its long tongue to drink sweet nectar from the flower. The flower has pink petals and a yellow center.

Scientific Phenomena

This image represents the anchoring phenomenon of pollination - a mutually beneficial relationship between insects and flowering plants. 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, enabling the plant to reproduce. This co-evolutionary relationship has developed over millions of years, with flowers evolving bright colors and sweet nectar to attract pollinators, while butterflies evolved specialized feeding structures to access these resources.

Core Science Concepts

1. Animal Needs and Behaviors: Butterflies need food (nectar) to survive and have specific body parts (proboscis) adapted for feeding
2. Plant Structures and Functions: Flowers have colorful petals to attract insects and produce nectar as a food reward
3. Interdependence in Nature: Animals and plants depend on each other - butterflies get food while helping plants make seeds
4. Life Cycles: Both butterflies and flowering plants go through predictable life cycle stages

Pedagogical Tip:

Use hand gestures and movement to help students understand the butterfly's feeding process. Have them pretend to unroll a "tongue" (arm) to reach into a flower, making the abstract concept concrete and memorable.

UDL Suggestions:

Provide multiple ways for students to observe pollination by offering magnifying glasses, close-up photos, and video clips. Allow students to express their understanding through drawing, acting out the process, or building models with craft materials.

Zoom In / Zoom Out

1. Zoom In: At the microscopic level, tiny pollen grains (containing male plant cells) stick to the butterfly's fuzzy body parts, legs, and antennae due to electrostatic forces and the pollen's sticky surface structures.

2. Zoom Out: This pollination interaction is part of a larger ecosystem web where flowering plants support not just adult butterflies, but also provide host plants for butterfly eggs and caterpillars, while the resulting seeds and fruits feed birds, mammals, and other insects throughout the food web.

Discussion Questions

1. What body parts does the butterfly use to get food from the flower? (Bloom's: Identify | DOK: 1)
2. How do you think the butterfly knows which flowers have the sweetest nectar? (Bloom's: Analyze | DOK: 2)
3. What might happen to the flowers if there were no butterflies or bees around? (Bloom's: Predict | DOK: 3)
4. How are a butterfly's mouth parts similar to and different from your mouth? (Bloom's: Compare | DOK: 2)

Potential Student Misconceptions

1. Misconception: "The butterfly is trying to help the flower on purpose"
Clarification: The butterfly is only looking for food - helping the plant reproduce is an accidental benefit that happens naturally.
2. Misconception: "All insects hurt plants"
Clarification: Many insects, like butterflies and bees, actually help plants by moving pollen between flowers so plants can make seeds.
3. Misconception: "Flowers are just pretty decorations"
Clarification: Flower colors and shapes are specifically designed to attract animal helpers - they're like advertisements for nectar.

Cross-Curricular Ideas

1. Math - Counting and Patterns: Students can count the yellow spots on the butterfly's wings and look for patterns in how they're arranged. They can also count the petals on the flower and compare numbers ("Does the flower have more petals or does the butterfly have more spots?").
2. ELA - Descriptive Writing: Students can draw their own butterfly on a flower and label body parts using vocabulary words (wings, antenna, proboscis). Teachers can scribe student sentences like "The butterfly drinks sweet nectar" and create a class book of butterfly stories.
3. Art - Color Mixing and Nature Collage: Students can paint or create collages of butterflies and flowers using tissue paper, markers, and watercolors. Discuss how bright colors help butterflies find flowers, then have students create their own "bright flowers" to attract butterflies.
4. Social Studies - Living Things in Our Community: Take students on a nature walk to observe real butterflies and flowers in your school garden or local park. Students can map where they found butterflies and discuss how we can help pollinators by planting native flowers in our community.

STEM Career Connection

1. Beekeeper/Pollinator Farmer - These scientists and farmers raise bees, butterflies, and other insects on farms and in gardens. They help plants make fruits and vegetables that we eat for lunch! Beekeepers also collect honey that bees make. Average Salary: \$50,000-\$65,000 per year

2. Botanist (Plant Scientist) - Botanists study how plants grow, what colors attract insects, and how flowers make seeds. They work in gardens, greenhouses, and laboratories to help us understand and protect plants. Average Salary: \$65,000-\$75,000 per year

3. Entomologist (Insect Scientist) - Entomologists are scientists who study insects like butterflies and bees. They observe butterflies' behavior, learn about their life cycles, and figure out how to protect them from disappearing. Average Salary: \$70,000-\$85,000 per year

NGSS Connections

- Performance Expectation: 1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs
- Disciplinary Core Ideas: 1-LS1.A - All organisms have external parts that they use to perform daily functions
- Crosscutting Concepts: Structure and Function - The shape and stability of structures of natural objects are related to their function

Science Vocabulary

- * Nectar: Sweet liquid that flowers make to feed butterflies and bees
- * Pollen: Tiny yellow powder that helps flowers make seeds
- * Proboscis: A butterfly's long, curled tongue used for drinking nectar
- * Pollination: When pollen moves from one flower to another to help make seeds
- * Petals: The colorful parts of a flower that attract insects

External Resources

Children's Books:

- The Magic School Bus Inside a Beehive by Joanna Cole
- From Seed to Plant by Gail Gibbons
- The Reason for a Flower by Ruth Heller