

Photo Description



A bee with yellow pollen on its body is visiting a bright red and yellow flower. The bee is collecting nectar and pollen from the flower's center, which helps feed the bee while also helping the flower make seeds. Both the bee and the flower need each other to survive and grow.

Scientific Phenomena

Anchoring Phenomenon: This image shows pollination—a symbiotic relationship where a bee and a flower help each other.

Why it happens scientifically: Bees visit flowers to collect nectar (sweet liquid food) and pollen (a powdery substance). As the bee moves from flower to flower, pollen sticks to its fuzzy body. When the bee visits the next flower, some of that pollen rubs off onto the new flower. This allows flowers to make seeds and new flowers to grow. The bee gets food; the flower gets help reproducing. Both organisms benefit from this relationship—this is called mutualism.

Core Science Concepts

- Living things have body parts that help them survive: The bee has a fuzzy body and specialized mouth parts to collect nectar. The flower has colorful petals and a sweet smell to attract bees.
- Organisms depend on each other: The bee needs the flower's nectar for food and energy. The flower needs the bee to carry pollen so it can make seeds and create new flowers.
- Adaptation and survival: Both the bee and flower have special features that help them work together—the bee's body is perfect for collecting pollen, and the flower's bright colors and sweet smell attract bees.
- Patterns in nature: Many plants and animals interact in helpful ways. Students can observe patterns of which animals visit which plants.

Pedagogical Tip:

Tip: Use the "bee's perspective" approach—ask students to pretend they ARE the bee visiting the flower. "What do you see? What do you need? How does the flower help you?" This embodied learning helps First Graders understand abstract relationships through movement and role-play.

UDL Suggestions:

UDL Strategy: Provide multiple means of representation by offering:

- A large, labeled diagram showing the bee and flower
- Real (or high-quality photos of) flowers and pictures of bees side-by-side
- A simplified animation or video clip of bee pollination

For engagement, allow students to use hand motions to mime pollen moving from flower to flower, making abstract concepts concrete and kinesthetic.

Zoom In / Zoom Out

Zoom In: The Microscopic View

At the microscopic level, pollen grains are tiny, individual particles with different shapes and textures depending on the plant species. Inside each pollen grain is genetic material that will fertilize the flower's ovary, allowing seeds to develop. The bee's body hairs are branched and hook-shaped (called "branched setae"), which make them perfect for catching and holding pollen grains.

Zoom Out: The Ecosystem Connection

At the ecosystem level, pollination is part of a much larger food web. Bees depend on many different flowering plants for nectar throughout the seasons. These plants depend on bees and other pollinators (butterflies, hummingbirds, beetles) to survive. The seeds that result from pollination feed birds and other animals, and the plants provide shelter and shade for many creatures. Without pollinators like bees, entire ecosystems would collapse because many plants wouldn't reproduce.

Discussion Questions

1. "Why do you think the flower is such a bright red and yellow color?" (Bloom's: Analyze | DOK: 2)
 - Expected thinking: Students should begin to recognize that bright colors attract the bee.
2. "What would happen to the flower if there were no bees to visit it?" (Bloom's: Evaluate | DOK: 3)
 - Expected thinking: Students may recognize that without pollen being moved, the flower couldn't make seeds or new flowers.
3. "How does the bee's fuzzy body help it?" (Bloom's: Explain | DOK: 2)
 - Expected thinking: Students should notice that the fuzz catches and holds pollen so it can be transported.
4. "Is the bee helping or hurting the flower? How do you know?" (Bloom's: Analyze | DOK: 2)
 - Expected thinking: Students should understand that the bee helps by moving pollen, even though the bee is taking nectar.

Potential Student Misconceptions

1. Misconception: "The bee is eating the flower."
 - Clarification: The bee is not eating the flower petals. The bee drinks the sweet liquid inside the flower called nectar, which gives the bee energy. The flower is not harmed—it still grows and makes seeds.
2. Misconception: "Bees and flowers are just in the same place by accident."
 - Clarification: Bees and flowers have a special relationship where they help each other. The flower's bright colors and sweet smell tell the bee "come here!" The bee helps the flower by moving pollen between flowers so new plants can grow.
3. Misconception: "The yellow powder on the bee is just dirt."
 - Clarification: The yellow powder is pollen, a special powder made by flowers. Pollen is very important because it helps make seeds. The bee accidentally carries pollen from flower to flower, which is very helpful!

Extension Activities

Activity 1: Bee and Flower Hand Craft

Students create a paper bee and flower using construction paper. As they make the bee, discuss its fuzzy body. As they make the flower, discuss its bright petals. Then, students can physically move their bee from flower to flower, using yellow glitter or yellow paint powder to represent pollen transfer. Life Science Connection: Students observe and recreate the pattern of pollen movement.

Activity 2: Real Flower Investigation

Bring real flowers (dandelions, daisies, or sunflowers) into the classroom. Provide hand lenses so students can observe the center of the flower closely. Ask: "Can you see the pollen?" and "Where would a bee land?" Gently shake the flower to release some pollen and show students the powder. Students can observe pollen on their hands and discuss how it sticks. Life Science Connection: Students make direct observations about flower structure and pollen characteristics.

Activity 3: Bee Movement Dance

Play music and have students move around the room as "bees" visiting "flowers" (made from paper circles on the floor). Give each student a small piece of yellow tissue paper or ribbon attached to their wrist to represent pollen. As they dance from flower to flower, the pollen "moves" with them. Afterward, discuss: "Did you help the flowers? How?" Life Science Connection: Students model pollination through movement and develop understanding of how organisms interact.

Cross-Curricular Ideas

1. Math: Create a simple graph showing "how many bees visited each flower" during the class's flower investigation. Count petals on different flowers and compare (which flower had more petals?). Estimate and count: "How many flowers might one bee visit in a day?"
2. ELA/Literacy: Read aloud age-appropriate books about bees and flowers (see book list below). Create a shared writing piece: "What the bee said to the flower" using simple sentence frames like "Dear Flower, I need _____. Can you help me?"
3. Social Studies/Community: Discuss local gardens, parks, or community spaces where bees and flowers live. Invite a local beekeeper to visit the classroom (or show a video interview). Discuss how people can help bees by planting flowers.
4. Art: Create a large collaborative mural showing a garden scene with multiple flowers and bees. Use bright colors and patterns to show how colors attract bees. Display with vocabulary words labeled.

STEM Career Connection

1. Beekeeper/Apiarist
 - Job Description: A beekeeper takes care of honeybees and helps them stay healthy and make honey. They check on the bees, make sure they have flowers to visit, and collect honey that bees make. Beekeepers help bees survive and help farmers' crops grow!
 - Average Salary: \$48,000–\$65,000 USD per year
2. Botanist (Plant Scientist)
 - Job Description: A botanist studies plants and flowers. They learn how plants grow, why they have different colors, and how animals like bees help plants make seeds. Botanists work in gardens, farms, or science labs to understand and protect plants.
 - Average Salary: \$63,000–\$85,000 USD per year
3. Pollinator Biologist/Ecologist
 - Job Description: These scientists study how bees, butterflies, and other animals pollinate flowers and help ecosystems stay healthy. They work to protect bees and other pollinators so that gardens, farms, and wild plants can keep growing.

- Average Salary: \$55,000–\$78,000 USD per year

NGSS Connections

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.

- 1-LS1.A — Structure and Function: All organisms have external parts that help them function.

- Structure and Function

1-LS1-2: Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.

- 1-LS1.B — Growth and Development: Adult plants and animals produce offspring (seeds, eggs) that grow into adults.

- Patterns

1-LS3-1: Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

- 1-LS3.A — Heredity: Young organisms are like but not exactly like their parents or siblings.

- Patterns

- Cause and Effect

Science Vocabulary

- * Pollination: When pollen moves from one flower to another, helping the flower make seeds.

- * Pollen: A tiny, yellow powder made by flowers that helps make seeds.

- * Nectar: A sweet liquid inside flowers that bees drink for food and energy.

- * Survive: To stay alive and healthy by getting food, water, and shelter.

- * Relationship: When two living things help each other or need each other.

- * Adaptation: A special body part or behavior that helps an animal or plant survive.

External Resources

Children's Books

- * "The Bee Tree" by Patricia Polacco — A beautiful story about a grandfather and granddaughter following bees to discover a wild bee tree, celebrating the connection between bees and nature.

- * "What Do Bees Do? All About Bees" by Melvin Berger (Step into Reading series) — A simple, engaging picture book that explains what bees do, how they collect pollen, and why they're important.

- * "From Flower to Bee" by Robin Nelson (Lerner Publications) — A photo-based book showing the relationship between flowers and bees, perfect for showing real images of pollination.

Teacher Note: This lesson builds foundational understanding of symbiotic relationships and organism interdependence—core concepts for life science in First Grade. The use of concrete observations (real flowers, bee pictures) and kinesthetic activities (dance, crafts) ensures all learners can access these concepts.