

## Photo Description



A honey bee lands on a purple flower to collect food. You can see yellow dust (called pollen) sticking to the bee's fuzzy body. This bee is helping the flower make seeds while getting food for itself!

## Scientific Phenomena

**Anchoring Phenomenon:** A bee visiting a flower and transferring pollen

**Why This Happens:**

Bees need nectar (a sweet liquid) and pollen (tiny yellow grains) for food. As the bee moves from flower to flower, pollen sticks to its hairy body. When the bee visits another flower, some pollen rubs off onto that flower. This helps flowers make seeds and new plants grow. This process is called pollination, and it's a win-win: the bee gets food, and the flower gets help reproducing. Many plants depend on bees and other insects to spread their pollen because plants cannot move on their own.

## Core Science Concepts

1. Plants need help to make seeds: Flowers use pollen to create seeds, but pollen must travel from one flower to another flower. Many plants rely on animals like bees to carry pollen for them.
2. Insects and plants work together: Bees visit flowers to eat nectar and pollen (food), and flowers benefit by having their pollen spread. This is an example of a helpful relationship between two living things.
3. Pollen is a powder that sticks: Pollen is yellow dust made by flowers. It clings to the bee's fuzzy body, like dust sticks to a sticky surface. This helps move pollen from place to place.
4. Different animals pollinate different plants: Bees are excellent pollinators, but butterflies, hummingbirds, and other insects also help spread pollen. Different flowers attract different pollinators.

### Pedagogical Tip:

When teaching pollination to second graders, use the analogy of "moving pollen like mail delivery." Ask students: "If flowers are houses and pollen is mail, what is the bee?" This concrete comparison helps young learners understand the abstract concept of a helping relationship between living things without overwhelming them with complex biology.

### UDL Suggestions:

**Representation:** Provide visual supports like enlarged images of pollen under a simple magnifying glass or projected close-up photos so all students can see the yellow dust clearly. Use multiple colors of yarn or string to physically model pollen transfer from flower to flower. **Action & Expression:** Allow students to demonstrate understanding through hands-on activities (like moving pom-poms between paper flowers) rather than written work. Offer choice in how they show learning: drawing, acting out the bee's journey, or arranging a flower sequence. **Engagement:** Connect to students' direct experiences: "Have you ever seen a bee on a flower? What do you think it was doing?" This personalizes the phenomenon.

## Zoom In / Zoom Out

### Zoom In: Inside the Flower

When we zoom in very close—closer than our eyes can see—we discover tiny structures inside the flower called the stamen (where pollen is made) and the pistil (where seeds start to grow). Pollen grains are so small that thousands could fit on the tip of a pencil! When a pollen grain lands on the pistil, it sends a tiny tube down into the flower that helps make a seed. The bee can't see this happening, but it's the invisible magic that makes new plants possible!

### Zoom Out: The Whole Garden Ecosystem

When we zoom out and look at the bigger picture, we see that this one bee visiting one flower is part of a much larger system. In a garden or meadow, hundreds of bees, butterflies, and other insects visit thousands of flowers throughout the day and season. All these pollination visits help create fruits, vegetables, and seeds that feed animals (including humans!) and help new plants grow. Without pollinators like bees, entire ecosystems would struggle because many plants couldn't make seeds, and animals that eat those plants and seeds would have no food. One small bee visiting one purple flower is connected to the health of the whole natural world around us!

## Discussion Questions

1. What do you think the bee is doing on the flower? (Bloom's: Remember | DOK: 1)
2. How does the yellow powder (pollen) help both the bee and the flower? (Bloom's: Analyze | DOK: 2)
3. If there were no bees visiting flowers, what might happen to the plants? (Bloom's: Evaluate | DOK: 3)
4. What other animals might help move pollen from flower to flower like bees do? (Bloom's: Create | DOK: 3)

## Potential Student Misconceptions

Misconception 1: "The bee is eating the flower."

Scientific Clarification: The bee is not eating the flower itself. The bee is drinking the sweet nectar (juice) from inside the flower and collecting pollen (yellow dust) to eat. The flower stays alive and continues to grow. The bee is like someone drinking juice from a cup—the cup doesn't disappear!

Misconception 2: "Pollen is sticky like glue, and that's why it stays on the bee."

Scientific Clarification: Pollen isn't actually sticky like glue. Instead, pollen grains are bumpy and spiky, and they stick to the bee's fuzzy hairs like Velcro sticks to itself—the bumpy pollen hooks onto the fuzzy hairs. This is why bees with fuzzier bodies are better at carrying pollen than smooth insects!

Misconception 3: "Bees are the only animals that help flowers make seeds."

Scientific Clarification: While bees are excellent pollinators, many other animals also help move pollen! Butterflies, moths, hummingbirds, beetles, and even the wind can carry pollen from flower to flower. Different flowers have different pollinators that work best for them.

## Extension Activities

1. Pollen Transfer Simulation: Give each student a paper flower and a small paintbrush. Have them dip the brush in yellow powder or glitter (representing pollen) and transfer it from one paper flower to another. Discuss how the fuzzy bee's body works like the paintbrush. Students can create their own flower garden and act as "bees" moving pollen between flowers.

2. Bee and Flower Movement Activity: Play music and have students move around the classroom as bees, visiting flower stations (created by other students). At each station, students pick up a small pom-pom or yarn "pollen" and drop it at the next station. This physically demonstrates how pollen travels and connects movement to the concept of pollination.

3. Flower Observation Walk: Take students on a nature walk to find real flowers outside (if available) or show pictures of flowers in your area. Have them look for insects (from a safe distance) and record observations on a simple chart: "What flower? What insect visited? What color is the pollen?" This builds observation skills and connects the lesson to their local environment.

### Cross-Curricular Ideas

**Math Connection: Counting and Graphing Pollinators**

Create a simple picture graph showing "How many bees, butterflies, and ladybugs visit flowers?" Students can draw tally marks or use stickers to represent different insects visiting flowers throughout a week-long observation. This builds graphing skills while reinforcing the concept that multiple pollinators help flowers.

**ELA Connection: "Letters from a Bee"**

Have students write or dictate a simple letter from the bee's perspective: "Dear Flower, Today I visited you and..." Students can illustrate their letters and create a class book. This combines narrative writing with science understanding and builds vocabulary in a creative, engaging way.

**Art Connection: Flower and Pollinator Mural**

Students create colorful painted or collaged flowers and insects on a large classroom mural. They can use various materials (tissue paper, paint, markers, pompoms) to show different types of flowers and pollinators. This combines fine motor skills, color mixing, and artistic expression while reinforcing the visual concept of pollination relationships.

**Social Studies Connection: "Helpers in Our Community"**

Just as the bee helps the flower, connect this to community helpers. Discuss how different people in the community have jobs that help others (mail carriers, teachers, firefighters, farmers). Ask: "How is the bee like a mail carrier?" This builds understanding of interdependence both in nature and in human communities.

### STEM Career Connection

**Beekeeper**

A beekeeper takes care of honeybees and helps them stay healthy and safe. Beekeepers make sure bees have good flowers to visit, check on bee colonies to make sure the queen bee is doing well, and collect honey that bees make.

Beekeepers help protect bees because bees are so important for growing our food!

Average Salary: \$48,000–\$65,000 per year

**Botanist (Plant Scientist)**

A botanist is a scientist who studies plants and flowers. Botanists learn how plants grow, what helps them be healthy, and how insects like bees help plants make seeds. Some botanists work in gardens or nature centers teaching people about plants, while others work in labs discovering new things about how plants and insects work together.

Average Salary: \$65,000–\$82,000 per year

**Pollinator Conservationist**

A pollinator conservationist is someone who works to protect bees and other insects that help flowers. They study which flowers bees love most, create special gardens and parks where pollinators can thrive, and teach people why bees are so important. These scientists help make sure we always have healthy bees to pollinate our food and beautiful flowers!

Average Salary: \$55,000–\$75,000 per year

### NGSS Connections

Performance Expectation:

2-LS2-1: Plan and conduct an investigation to provide evidence that plants get the materials they need for growth chiefly from air and water.

Disciplinary Core Ideas:

- 2-LS2.A (Interdependent Relationships in Ecosystems)
- 2-LS2.B (Cycle of Matter and Energy Transfer in Ecosystems)

Crosscutting Concepts:

- Systems and System Models
- Structure and Function

Science and Engineering Practices:

- Engaging in Argument from Evidence
- Developing and Using Models

### Science Vocabulary

- \* Pollen: Tiny yellow grains made by flowers that help create seeds.
- \* Pollination: The process of moving pollen from one flower to another so seeds can grow.
- \* Nectar: A sweet liquid inside flowers that bees drink as food.
- \* Bee: An insect with a fuzzy body that collects pollen and nectar from flowers.
- \* Flower: The colorful part of a plant that makes pollen and seeds.

### External Resources

Children's Books:

- The Bee Tree by Patricia Polacco (A story about a community working together to find honey, with beautiful illustrations of bees and flowers)
- Bee: A Life by Melanie Arwin (Simple, gorgeous illustrations showing the bee's life and relationship with flowers)
- From Flower to Bee by Kate Riggs (Short, fact-filled picture book perfect for second graders about pollination)

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Teacher Note: This lesson pairs beautifully with spring gardening projects or visits to local botanical gardens. Second graders are naturally curious about insects and flowers—use this image to spark wonder about the hidden relationships in nature!