# Bumble Bee

Life Science | Lesson Guide

5th Grade

## Photo Description

This image shows a bumblebee visiting a bright magenta flower with yellow stamens. You can see the bee's fuzzy yellow and black body, its dark wings, and pollen clinging to its legs. The bee is collecting nectar and pollen from the flower's center, which will help the plant make seeds.

## Scientific Phenomena

Anchoring Phenomenon: Why do bees visit flowers, and what happens because of it?

When a bumblebee lands on a flower to drink nectar (a sweet liquid), pollen grains stick to the fuzzy hairs covering its body. As the bee flies to the next flower, some of that pollen rubs off onto the new flower's stigma (the female part). This process, called pollination, allows plants to reproduce and make seeds. The bee benefits by getting food (nectar and pollen), and the plant benefits by spreading its pollen—this is called a mutualistic relationship.

## Core Science Concepts

* Pollination and Plant Reproduction: Plants depend on pollinators like bees to transfer pollen between flowers so they can produce seeds and fruit. Without pollinators, many plants cannot reproduce successfully.

* Flower Structure and Function: Flowers have specialized parts (stamens produce pollen, stigmas receive pollen) designed to attract pollinators. Bright colors, sweet nectar, and patterns guide insects to the pollen and nectar.

* Adaptation: Bumblebees have adapted features—fuzzy bodies, long tongues, and specialized legs with pollen baskets—that make them excellent pollinators. Flowers have adapted bright colors and sweet smells to attract bees.

* Food Chains and Ecosystems: Bees are part of food chains and ecosystems. Plants provide food for bees; bees pollinate plants so they produce seeds and fruit that feed many animals, including humans.

**Pedagogical Tip:**

Start this lesson by asking students to predict: "If all the bees disappeared, what would happen to the flowers and fruits we eat?" This activates prior knowledge and creates curiosity. Then reveal that about 1 out of every 3 bites of food we eat depends on pollinators. This real-world connection increases engagement and relevance.

**UDL Suggestions:**

Multiple Means of Representation: Provide a labeled diagram of a flower's parts alongside the photo. Some students benefit from seeing the structure labeled (stamen, stigma, pistil, petal). Use both visual images and verbal descriptions.

Multiple Means of Action & Expression: Allow students to demonstrate understanding through drawing, building a model flower from craft materials, or creating a diagram showing pollen transfer—not just writing or verbal responses.

Multiple Means of Engagement: Invite a local beekeeper or show a short video of bees pollinating to increase emotional connection and real-world relevance.

## Discussion Questions

1. What do you think the bee is doing on the flower, and why does the flower need the bee? (Bloom's: Understand | DOK: 1-2)

2. Why do you think flowers are bright colors and smell sweet? How does this help both the flower and the bee? (Bloom's: Analyze | DOK: 2-3)

3. If bumblebees could not visit flowers, what would happen to the plant's ability to make seeds? Explain your thinking. (Bloom's: Evaluate | DOK: 3)

4. Look at the bee's fuzzy body and legs in the photo. How is the bee's body specially designed (adapted) to be a good pollinator? (Bloom's: Analyze | DOK: 2-3)

## Extension Activities

1. Create a Model Flower: Provide students with craft materials (pipe cleaners, tissue paper, beads, paint) to build a 3D flower model. Have them label the main parts (petals, stamens, stigma) and explain how a bee would interact with their model. This kinesthetic activity reinforces flower structure and function.

2. Pollinator Observation Walk: If weather permits, take students on a short outdoor walk to observe real flowers and pollinators (bees, butterflies, etc.). Have students sketch what they see, note the colors and types of flowers, and count how many different pollinators they observe. Back in the classroom, create a class chart of findings.

3. What Would Happen If...? Scenario Cards: Give small groups scenario cards (e.g., "All the bees disappear," "Flowers stopped making nectar," "Flowers turned gray instead of colorful"). Have each group discuss and predict consequences using evidence from the lesson. Groups can present findings and debate their predictions.

## NGSS Connections

Performance Expectation: 5-LS1-1 – Support an argument that plants get the materials they need for growth chiefly from air and water.

Disciplinary Core Ideas:
- 5-LS1.A – Structures and Functions: Plants have different structures to accomplish growth, reproduction, and nutrient transport.
- 5-LS2.A – Interdependent Relationships in Ecosystems: Organisms interact with their environment and other organisms.

Crosscutting Concepts:
- Structure and Function – The fuzzy body structure of the bee functions to collect pollen; flower structures function to attract pollinators.
- Systems and System Models – Pollination is part of a larger plant reproduction system; it's also part of an ecosystem.

## Science Vocabulary

* Pollination: The process of moving pollen from one flower to another, which allows plants to make seeds.

* Pollen: Tiny grains produced by flowers that contain the male cells needed to make seeds.

* Nectar: A sweet liquid made by flowers that bees drink for energy and food.

* Pollinator: An animal (like a bee, butterfly, or bird) that helps move pollen from flower to flower.

* Adaptation: A special body part or behavior that helps an animal or plant survive and do its job in nature.

* Stamen: The male part of a flower that produces pollen.

* Stigma: The female part of a flower that receives pollen.

## External Resources

Children's Books:
- The Bee Tree by Patricia Polacco – A charming story about a girl learning the importance of bees and flowers from her grandfather.
- Bee and Me by Alison Jay – An illustrated exploration of bee anatomy, life cycles, and the bee-flower relationship.
- The Reason for a Flower by Ruth Heller – A beautifully illustrated rhyming book explaining why flowers exist (pollination and reproduction).

YouTube Videos:
- "How Do Bees Help Plants? | National Geographic Kids" – An engaging 4-minute animation explaining pollination and why bees matter. URL: https://www.youtube.com/watch?v=U1VCfZE-8WU

- "The Life of a Bumblebee" – Crash Course Kids – A fun, fast-paced 5-minute introduction to bumblebee anatomy, behavior, and pollination. URL: https://www.youtube.com/watch?v=rF8SHvR-Uw0

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Teacher Note: This lesson naturally scaffolds into discussions about food security, ecosystem health, and human impact on pollinator populations—all age-appropriate extensions for engaged Fifth Grade students.