Insect Characteristics

Life Science | Lesson Guide

2nd Grade

Photo Description

This image shows a green grasshopper resting on a plant leaf. You can see the grasshopper's body has three main parts: a head with big eyes and long antennae, a middle section called the thorax where the legs attach, and a back section called the abdomen. The grasshopper has six legs and can jump very far because its back legs are extra large and muscular.

Scientific Phenomena

Anchoring Phenomenon: Why does this grasshopper have such large back legs?

Grasshoppers have evolved powerful back legs because they use jumping as their primary method of movement and escape from predators. The large muscles in the hind legs store energy and release it quickly, allowing grasshoppers to jump many times their own body length. This adaptation helps them survive in their environment by allowing them to move quickly through vegetation and escape danger. Young students can observe that the back legs are noticeably bigger and different from the front and middle legs—this is a visible example of how animals' body parts are designed for specific jobs.

Core Science Concepts

* All insects have three body parts: Every insect has a head (with eyes, antennae, and mouth), a thorax or middle section (where legs attach), and an abdomen (the back section). This grasshopper clearly shows all three parts.

* Insects have six legs: Unlike spiders (which have 8) or other creatures, all insects have exactly six legs. This grasshopper has three pairs of legs—two pairs in front and one pair in back.

* Body parts have specific jobs: The grasshopper's long antennae help it sense its environment, its eyes help it see, and its powerful back legs help it jump away from danger. Each part does an important job.

* Animals are adapted to their environment: The grasshopper's green color helps it hide in plants, and its strong jumping legs help it escape predators and move through grassy areas where it lives.

Pedagogical Tip:

When teaching insect body parts to second graders, use the phrase "Head, Thorax, Abdomen" as a memorable chant or rhythm. Have students count the legs together ("1, 2, 3, 4, 5, 6!") and point to each body part on the image or a model. This multi-sensory approach reinforces learning and keeps young learners engaged.

UDL Suggestions:

To support diverse learners: (1) Provide a labeled diagram or poster of a grasshopper that students can reference and touch; (2) Allow students to observe real insects (in a safe, contained setting) or use high-quality videos if live specimens aren't available; (3) Offer both verbal descriptions and visual representations so auditory and visual learners both benefit; (4) Use actual insects or large 3D models so students with visual impairments can explore through touch.

Zoom In / Zoom Out

Zoom In: Microscopic Level
If we could look at a grasshopper's skin under a powerful microscope, we would see it is covered with tiny bumps and ridges that help protect the grasshopper like armor. These bumps are also connected to sensory cells that help the grasshopper feel vibrations in the ground and air around it—like tiny alarm bells that tell it when danger is near! The grasshopper's muscles are made of millions of tiny fibers that work together to create the powerful jump. Scientists study these super-strong muscle fibers to understand how animals move and to help design better sports equipment for people.

Zoom Out: Ecosystem Level
This grasshopper is part of a bigger community of living things called an ecosystem. The grasshopper eats plants (like the leaf it's sitting on), and it becomes food for birds, snakes, and spiders. The grasshopper also helps the ecosystem by spreading seeds from plant to plant on its body and through its droppings, which helps new plants grow. When we understand how grasshoppers fit into their ecosystem, we see that they are not just interesting insects to observe—they are important helpers that keep gardens, fields, and grasslands healthy and balanced.

Discussion Questions

1. What do you notice about the grasshopper's back legs compared to its front legs? Why do you think they are different? (Bloom's: Analyze | DOK: 2)

2. How do you think the grasshopper's long antennae help it find food or stay safe? (Bloom's: Evaluate | DOK: 3)

3. If you look at other insects like ants or beetles, do you think they will have the same three body parts as this grasshopper? Why or why not? (Bloom's: Create | DOK: 3)

4. How does the grasshopper's green color help it survive in a garden or field? (Bloom's: Understand | DOK: 2)

Potential Student Misconceptions

Misconception 1: "Grasshoppers are insects because they are small."
Clarification: Size is not what makes something an insect. An animal is an insect because it has exactly three body parts (head, thorax, abdomen) and six legs. A grasshopper is an insect because of these body parts, not because it is small. A large insect and a tiny insect are both insects if they have these three features.

Misconception 2: "All insects that jump must be grasshoppers."
Clarification: Many insects can jump, including crickets, fleas, and some beetles. Grasshoppers are special jumpers because of their extra-large back legs, but other insects can jump too. We identify a grasshopper by looking at its specific body shape, color, and leg size—not just by watching it jump.

Misconception 3: "The grasshopper's antennae are used for jumping."
Clarification: The long antennae are sensors that help the grasshopper smell, taste, and feel its surroundings. The powerful back legs do the jumping. Each body part has one main job, and the antennae's job is sensing, not jumping.

Extension Activities

1. Insect Hunt and Observation: Take students on a safe, supervised outdoor exploration to find different insects (grasshoppers, beetles, ants, flies). Have them draw or photograph the insects they find and count the legs on each one. Back in the classroom, create a chart together showing "Insects with 6 Legs" and discuss what they observed.

2. Build a Grasshopper Model: Provide students with craft materials (pipe cleaners, paper cups, beads, paint) to build a model grasshopper with the three body parts clearly labeled. Have students color it green or brown to match real grasshoppers. Display the models and have classmates identify the body parts on each model.

3. Jump Like a Grasshopper: In a safe indoor or outdoor space, have students practice jumping and see how far they can leap. Then discuss: "If grasshoppers can jump 20 times their body length, how many times longer can they jump than you?" This makes the concept of adaptation concrete and fun.

Cross-Curricular Ideas

Math Connection: Measurement and Jumping Distance
Have students measure how far a grasshopper can jump compared to how far they can jump. Create a simple chart showing: "Grasshopper body length = 2 inches" and "Grasshopper jump = 40 inches (20 times its body length)." Then measure each student's height and calculate, "If I could jump like a grasshopper, I could jump _____ feet!" This makes multiplication and comparison concrete and exciting.

ELA Connection: Descriptive Writing and Observation Journal
Ask students to look carefully at the grasshopper photo and write or draw observations using sensory words: "The grasshopper is bumpy and green. Its antennae are long and curved. Its back legs are big and strong." Create a classroom "Insect Observation Journal" where students draw different insects and label their body parts using complete sentences or simple descriptions.

Art Connection: Camouflage and Coloring
Discuss how the grasshopper's green color helps it hide in plants (camouflage). Have students paint or color their own grasshopper using green, brown, and yellow colors to match real grasshoppers. Then create a "hide-the-grasshopper" bulletin board where students try to spot painted grasshoppers hidden in painted grass and leaves, reinforcing the concept that body color helps animals survive.

Social Studies Connection: Habitats Around the World
Explore where grasshoppers live around the world—in grasslands, gardens, forests, and fields on different continents. Show students a world map and discuss: "Grasshoppers live on every continent except Antarctica. Why do you think they can live in so many different places?" This introduces students to different habitats and the idea that some animals are adaptable to many environments.

STEM Career Connection

Entomologist (Insect Scientist)
An entomologist is a scientist who studies insects like grasshoppers, beetles, and butterflies. They observe insects in nature, draw pictures of them, write down what they see, and learn how insects help or hurt plants and people. Some entomologists work in museums, universities, or farms to help farmers protect their crops from harmful insects. They use microscopes, cameras, and notebooks to do their important work. Average Annual Salary: $63,000–$75,000 USD

Agricultural Specialist / Pest Control Expert
Agricultural specialists help farmers and gardeners keep their plants healthy by learning about insects that might eat the plants. They study grasshoppers and other insects to understand if they are helpful or harmful to crops. They might recommend safe ways to protect plants without hurting the insects or the environment. This job helps make sure we have enough food to eat. Average Annual Salary: $58,000–$68,000 USD

Wildlife Photographer / Nature Illustrator

Wildlife photographers and nature illustrators take beautiful pictures and make detailed drawings of insects like grasshoppers for books, websites, and museums. They spend time outdoors finding insects, learning about them, and capturing their details with cameras or paintbrushes. Their work helps other people learn about and appreciate insects. Average Annual Salary: $45,000–$70,000 USD (depending on experience and clients)

NGSS Connections

Performance Expectation: 2-LS1-1 Plan and conduct investigations to provide evidence that plants get the energy they need to grow chiefly from sunlight; plants get water through their roots.

Disciplinary Core Ideas:
- 2-LS1.A Structure and Function (insects have specific body structures that help them survive)
- 2-LS4.D Biodiversity and Humans (different animals have different body structures suited to where they live)

Crosscutting Concepts:
- Structure and Function (the grasshopper's body parts are shaped and sized for specific purposes)
- Patterns (all insects follow the pattern of having 6 legs and 3 body parts)

Science Vocabulary

* Antennae: Long, thin feelers on an insect's head that help it sense things like smell and touch.

* Thorax: The middle section of an insect's body where all six legs are attached.

* Abdomen: The back section of an insect's body that contains the stomach and other important organs.

* Adapt: When an animal's body or behavior changes over time to help it survive better in its home.

* Predator: An animal that hunts and eats other animals for food.

External Resources

Children's Books:
- Grasshoppers by Nic Bishop (Scholastic Press) — Beautifully illustrated nonfiction book with close-up photos and simple facts about grasshopper body parts and behavior.
- The Very Hungry Caterpillar by Eric Carle (World of Eric Carle) — While about a caterpillar, this book teaches insect life cycles and metamorphosis in an engaging, repetitive format.
- Insects by Rebecca Stefoff (Benchmark Books) — Simple informational text with labeled diagrams of common insects, perfect for second grade.

Additional Coaching Note: This image is an excellent anchor for teaching observable insect characteristics because the grasshopper's features are clear, colorful, and directly visible. Encourage your students to be "scientists" by noticing details: the bumpy skin texture, the size of the eyes, the curve of the antennae. Observation is the foundation of all science!