

Photo Description



This image shows a grasshopper sitting on a green leaf. The grasshopper has a green body with brown markings, long antennae (feelers) sticking out from its head, and powerful back legs. You can see its large eyes and the way its body is built for jumping and living on plants.

Scientific Phenomena

Anchoring Phenomenon: Why do grasshoppers have the body parts they do?

Grasshoppers have specific body structures that help them survive in their environment. Their long, powerful back legs allow them to jump away from predators quickly. Their antennae help them sense their surroundings and find food. Their green color helps them blend in with plants, protecting them from animals that want to eat them. This is called adaptation—animals develop special features over many generations that help them survive and thrive in their habitat.

Core Science Concepts

- * Insect Body Structure: All insects have six legs, three body parts (head, thorax, and abdomen), and antennae. Grasshoppers are insects.
- * Adaptations: Grasshoppers have strong back legs for jumping, antennae for sensing, and green coloring to hide on plants. These features help them survive.
- * Life Cycles: Grasshoppers go through different stages of growth before becoming adults that can jump and reproduce.
- * Habitats and Food Chains: Grasshoppers live on plants and eat grass and leaves. They are food for birds, lizards, and other animals.

Pedagogical Tip:

When teaching about insect adaptations, use the strategy of "structure meets function." Have students physically act out how each body part helps the grasshopper survive (e.g., pretend to jump with powerful legs, wave antennae to sense food). This kinesthetic approach helps fourth graders remember that body structures have specific jobs.

UDL Suggestions:

To support diverse learners: (1) Provide labeled diagrams of grasshopper body parts for visual learners; (2) Allow students to handle preserved insects or use digital magnifying tools; (3) Offer a word bank of vocabulary terms; (4) Create a comparison chart showing how grasshopper legs differ from human legs to activate prior knowledge.

Discussion Questions

1. What body parts does this grasshopper have that help it survive in its environment, and why do you think it needs each one? (Bloom's: Analyze | DOK: 2)
2. How would a grasshopper's life be different if it didn't have strong back legs for jumping? (Bloom's: Evaluate | DOK: 3)
3. Why do you think this grasshopper is green instead of red or blue? (Bloom's: Infer | DOK: 2)
4. If grasshoppers lived in a rocky desert instead of a grassy field, what body changes might help them survive better over many generations? (Bloom's: Create | DOK: 3)

Extension Activities

1. Grasshopper Body Part Investigation: Provide students with clear pictures or preserved specimens (from scientific supply companies). Have them use hand lenses to observe and sketch each body part. Create a labeled diagram together, and discuss what each part does. Students can then teach a partner about their observations.
2. Adaptation Design Challenge: Show students pictures of different habitats (desert, forest, ice). Ask: "If a grasshopper lived here instead of on grass, what would need to change?" Have students draw an adapted grasshopper and explain how each change would help it survive in that new environment.
3. Insect Diversity Walk & Comparison Chart: Take students on a nature walk (or show nature photos) to observe different insects. Create a comparison chart showing how grasshoppers are similar to and different from other insects like ants, beetles, or butterflies. This reinforces that insects share common features but have unique adaptations.

NGSS Connections

Performance Expectation:

4-LS1-1: Construct an argument that plants get the materials they need for growth chiefly from air and water.

Related Performance Expectation:

4-LS1-2: Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

Disciplinary Core Ideas:

- * 4-LS1.A — Structure and Function
- * 4-LS1.D — Information Processing
- * 4-LS4.B — Natural Selection

Crosscutting Concepts:

- * Structure and Function — The shape and materials of natural and designed objects relate to common uses.
- * Cause and Effect — Events that occur together with regularity might or might not have a causal relationship. Further investigation is needed to determine whether they are related.

Science Vocabulary

- * Adaptation: A body part or behavior that helps an animal survive in its environment.
- * Antennae: Long, thin feelers on an insect's head that help it sense things around it, like food and danger.
- * Thorax: The middle section of an insect's body where the legs and wings attach.

* Camouflage: Coloring or pattern that helps an animal blend in with its surroundings so predators don't see it.

* Habitat: The place where an animal or plant naturally lives and finds food, water, and shelter.

External Resources

Children's Books:

Grasshoppers* by Gail Gibbons (Clear illustrations and age-appropriate facts about grasshopper life cycles and behavior)

The Very Hungry Caterpillar* by Eric Carle (Classic book connecting to insect growth and eating habits; can extend to discuss insect metamorphosis)

Jump, Frog, Jump!* by Robert Kalan (Interactive rhyming text about jumping, connects to grasshopper adaptations)

YouTube Videos:

* "Grasshoppers: Amazing Insects" by National Geographic Kids — A 3-minute overview of grasshopper anatomy, jumping ability, and life cycle. <https://www.youtube.com/watch?v=national-geo-grasshoppers> (Note: Search "National Geographic Kids grasshoppers" on YouTube for age-appropriate insect content)

* "How High Can a Grasshopper Jump?" by Crash Course Kids — A 4-minute video explaining adaptation through the lens of grasshopper jumping mechanics and comparing to human abilities. https://www.youtube.com/playlist?list=PLyITVt_5NdKWNBj-Kbs8xNP5FPLvqS3L1 (Search Crash Course Kids channel for insect videos)

Teacher Tip: This image is an excellent "hook" for a unit on animal structures and adaptations. Consider starting your lesson by asking students to predict what each body part does before revealing the answer. This activates their prior knowledge and makes the learning more engaging!