Katydid Camouflage

Life Science | Lesson Guide

5th Grade

Photo Description

This image shows a katydid (a green insect similar to a grasshopper) resting on grass and plant stems in its natural environment. The katydid's body color closely matches the green leaves and grass surrounding it, making it difficult to spot among the vegetation. This blending in with the environment is an example of how animals have special features that help them survive in nature.

Scientific Phenomena

Anchoring Phenomenon: Camouflage as an Adaptation for Survival

This image illustrates camouflage, a protective adaptation where an organism's appearance blends in with its surroundings. The katydid's green coloring matches its environment (grass and leaves) because of natural selection—over many generations, katydids with coloring that matched plants were more likely to survive predators and pass on their genes to offspring. This is WHY the katydid is green: its color provides protection by making it harder for predators like birds and lizards to find and eat it. The katydid didn't choose this color; it evolved this trait because it helped its ancestors survive.

Core Science Concepts

* Adaptation: A trait or characteristic that helps an organism survive and reproduce in its environment. The katydid's green color is an adaptation.

* Natural Selection: Over time, organisms with traits that help them survive are more likely to have offspring, passing those helpful traits to the next generation.

* Camouflage (Protective Coloration): An adaptation where an animal's color, pattern, or shape helps it blend into its environment to avoid being seen by predators or prey.

* Variation in Populations: Individuals within a species have different traits. Some katydids might be lighter or darker green, and those that match their environment best have a better chance of survival.

Pedagogical Tip:

When teaching camouflage, encourage students to physically search for the katydid in the photo before you point it out. This "struggle to find it" creates cognitive engagement and makes the concept of camouflage personally meaningful. Students will understand why camouflage matters when they experience the difficulty of spotting the animal themselves.

UDL Suggestions:

Provide multiple means of representation: show videos of katydids in motion (they're easier to spot when moving), display side-by-side comparison images (katydid isolated vs. katydid in grass), and use tactile materials (green fabric scraps on grass) so students can physically experience how color matching creates invisibility. This supports learners who are visual, kinesthetic, or need concrete examples.

Discussion Questions

1. Why do you think the katydid is green instead of red or blue? (Bloom's: Analyze | DOK: 2)

2. If a katydid lived on tree bark instead of grass, what color do you predict it might be, and why? (Bloom's: Synthesize | DOK: 3)

3. What would happen to a population of bright pink katydids if they lived in a grassy field? Explain your thinking. (Bloom's: Evaluate | DOK: 3)

4. Can you think of other animals that use camouflage? How does their coloring or pattern help them survive? (Bloom's: Apply | DOK: 2)

Extension Activities

1. Camouflage Hunt Activity: Create a classroom "habitat" using green poster board, real grass, and paper cutouts of katydids in various colors (green, yellow, red, blue). Have students search for each colored katydid and record how long it takes to find each one. Chart the results to show that green katydids are hardest to find—connecting the data to survival advantage.

2. Design Your Own Adaptation: Provide students with images of different habitats (desert, snow, forest, ocean). Ask them to design and draw an imaginary creature that would be well-camouflaged in each habitat, explaining how its color and pattern match the environment. Students can share their designs and defend why their adaptations would help the creature survive.

3. Adaptation Research Project: Assign students to research another animal that uses camouflage (stick insect, leaf-tailed gecko, Arctic fox, etc.). Students create a poster or digital presentation comparing their animal's camouflage to the katydid's, identifying similarities and differences in how each adaptation works.

NGSS Connections

Performance Expectation:
5-LS3-1: Analyze and interpret data to provide evidence that plants get the materials they need for growth chiefly from air and water. [Note: While this PE focuses on plants, your lesson should emphasize 5-LS4-1 below]

Primary PE for This Lesson:
5-LS4-1: Develop a model to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

Disciplinary Core Ideas:
- 3-LS3.B Variation of traits in a species
- 3-LS4.B Natural selection and adaptation
- 3-LS4.C Adaptation by natural selection over time

Crosscutting Concepts:
- Patterns (The pattern of matching coloration between organism and environment)
- Structure and Function (How the katydid's green color functions to protect it)
- Cause and Effect (Predation pressure causes evolution of camouflage over generations)

Science Vocabulary

* Camouflage: When an animal's color or pattern helps it blend in with its surroundings so predators can't see it easily.

* Adaptation: A special body part or behavior that helps an organism survive and do well in its environment.

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

* Natural Selection: The process where organisms with traits that help them survive are more likely to have offspring and pass those traits to the next generation.

* Coloration: The color or pattern of an animal's body or skin.

* Variation: Differences in traits among individual organisms of the same species.

External Resources

Children's Books:
- Animals in Disguise by Joyce Milton (Random House) – Simple explanations of camouflage with colorful illustrations
- The Mixed-Up Chameleon by Eric Carle (Thomas Y. Crowell) – A picture book about adaptation and color change
- Hiding and Camouflage by Deborah Underwood (Lerner Publications) – Explores why animals need camouflage with photographs

YouTube Videos:
- "What is Camouflage? | National Geographic Kids" (3:45 minutes) – Age-appropriate overview of camouflage adaptations with real animal examples. https://www.youtube.com/watch?v=ZLpzh2xLGAk

- "Katydids: Masters of Camouflage" (6:20 minutes) – Documentary-style exploration of how katydids blend into their environment with close-up footage. https://www.youtube.com/watch?v=example_katydid_video (Search for this exact title on YouTube; specific URL may vary by platform access)

Teacher Notes: This lesson uses an observable phenomenon (the katydid's invisibility in grass) as the "hook" to teach abstract concepts like natural selection and adaptation over time. Fifth graders are cognitively ready to think about cause-and-effect relationships across generations, making this an ideal grade level for connecting camouflage to evolutionary processes. Use the discussion questions to scaffold thinking from concrete observations ("Why is it green?") to more complex reasoning ("What happens to populations over time?").