# Katydid Camouflage

Life Science | Lesson Guide

4th Grade

## Photo Description

This image shows a katydid, an insect that looks like a green leaf, resting on grass and plant stems. You can see how the katydid's green wings and body blend in perfectly with the green plants around it, making it very hard to spot. This is an excellent example of how some animals change their appearance to hide from predators.

## Scientific Phenomena

Anchoring Phenomenon: Camouflage (or protective coloration)

The katydid in this image demonstrates camouflage—a survival adaptation where an organism's color, pattern, or shape matches its environment. Scientifically, this happens through natural selection over many generations. Katydids with green coloring were more likely to survive predation because predators couldn't see them easily among green plants. These katydids survived to reproduce and passed this green coloring trait to their offspring. Over time, the katydid population became predominantly green. This is not a conscious choice by the katydid; rather, it's an inherited physical trait that helps the species survive in grassy, leafy environments.

## Core Science Concepts

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

* Camouflage/Protective Coloration: When an animal's color or pattern matches its surroundings so it can hide. The katydid looks like a green leaf, so predators have a harder time seeing it.

* Natural Selection: Over time, organisms with traits that help them survive are more likely to have offspring. Katydids that were green survived better and passed this trait to their babies.

* Predator-Prey Relationships: Predators hunt other animals (prey) for food. Camouflage helps prey animals escape being eaten.

**Pedagogical Tip:**

When teaching camouflage, avoid the misconception that animals "choose" to change color or intentionally hide. Fourth graders often anthropomorphize animals. Emphasize that camouflage is an inherited trait that develops over many generations through natural selection, not a conscious decision made by individual animals.

**UDL Suggestions:**

To support diverse learners:
- Representation: Show multiple photos of different animals with camouflage (stick insects, moths, deer) so students see patterns across examples, not just one case.
- Action/Expression: Allow students to demonstrate understanding through drawing, creating a camouflaged animal with craft materials, or playing a "spot the animal" game rather than only through written responses.
- Engagement: Connect to student interests by asking, "What animal would YOU hide from?" to make the predator-prey relationship personal and relevant.

## Discussion Questions

1. Why do you think the katydid is green instead of red or blue? (Bloom's: Analyze | DOK: 2)
   This question asks students to connect the katydid's color to its environment.

2. If a katydid lived on brown tree bark instead of green grass, what might happen to katydids with green wings over many years? (Bloom's: Evaluate | DOK: 3)
   This pushes students to think about natural selection and adaptation over time.

3. What predators do you think hunt katydids, and how does camouflage help the katydid survive? (Bloom's: Comprehend/Apply | DOK: 2)
   This helps students understand predator-prey relationships.

4. Can you think of another animal that uses camouflage to hide? How is its hiding method similar to or different from the katydid's? (Bloom's: Analyze | DOK: 2)
   This allows for comparative thinking and transfers learning to other organisms.

## Extension Activities

1. Camouflage Hunt Game: Hide paper cutouts of various colored insects (green, red, blue, yellow) on a bulletin board or poster board filled with green leaves, brown bark images, or other natural textures. Have students count how many of each color they can find in 30 seconds. Discuss why green insects were easiest/hardest to find. This demonstrates camouflage's effectiveness firsthand.

2. Design Your Own Camouflaged Animal: Give students a specific habitat (forest floor, snow, ocean sand, or desert) and ask them to draw and color an animal that would be camouflaged there. Have them explain in 2-3 sentences why their animal's colors and patterns would help it hide. This applies the concept creatively and develops predictive thinking.

3. Observational Nature Walk: Take students outside to observe insects and small animals in the school garden or nearby green space. Challenge them to find as many camouflaged creatures as possible (grasshoppers, crickets, moths on tree bark, caterpillars on leaves). Photograph or sketch findings and create a classroom display. This grounds the lesson in real-world observation and builds scientific observation skills.

## NGSS Connections

Performance Expectation:
4-LS1-1: Construct an argument that plants get the materials they need for growth chiefly from air and water. (Note: While this specific PE focuses on plant growth, the camouflage concept is better aligned with the PE below.)

Better-Aligned Performance Expectation:
4-LS4-2: Make observations and write descriptions about the diversity of animal structures that contribute to different functions. (Structures like leaf-like wings contribute to camouflage function.)

Disciplinary Core Ideas:
- 4-LS4.A - Evidence of Common Ancestry and Diversity
- 4-LS4.C - Adaptation

Crosscutting Concepts:
- Structure and Function
- Patterns

## Science Vocabulary

* Adaptation: A body part or behavior that helps an animal survive in its environment (the katydid's green color is an adaptation).

* Camouflage: When an animal's color or pattern looks like its surroundings so predators can't see it easily.

* Predator: An animal that hunts and eats other animals (a bird that eats katydids is a predator).

* Prey: An animal that is hunted and eaten by other animals (a katydid is prey for birds and spiders).

* Natural Selection: The process where organisms with helpful traits survive longer and have more babies, passing those traits to the next generation.

## External Resources

Children's Books:
The Mixed-Up Chameleon* by Eric Carle (explores color change and adaptation in an engaging, illustrated format)
Who Hides Here?* by Wendy Pfeffer (focuses on animal camouflage across different habitats)
Hiding in Plain Sight: How Animals Disguise Themselves* by Celia Godkin (detailed picture book about various camouflage strategies)

YouTube Videos:
* "Camouflage: How Animals Hide in Plain Sight" - TED-Ed Lessons
A 4-minute animated video explaining camouflage with clear examples. Perfect for Fourth Grade.
https://www.youtube.com/watch?v=xX2zEe3eJXU

* "Animal Camouflage" - National Geographic Kids
A 3-minute video showing real animals in their habitats that use camouflage, including insects and larger animals.
https://www.youtube.com/watch?v=xrXvVQvP5W4

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Notes for the Teacher:
This lesson leverages the katydid image as a concrete, observable anchor for abstract concepts like adaptation and natural selection. Fourth graders are developing the ability to think about cause-and-effect relationships and to understand that traits help organisms survive. The discussion questions and activities scaffold from observation to explanation to application, building critical thinking skills in alignment with NGSS expectations.