Snake Skin

Life Science | Lesson Guide

4th Grade

Photo Description

This image shows a garter snake camouflaged among dried wood chips, grass, and plant material. The snake's patterned skin with stripes helps it blend into its surroundings. You can see the snake's scales clearly—the small, overlapping pieces that cover and protect the snake's entire body.

Scientific Phenomena

Anchoring Phenomenon: Why is the snake hard to see in this wood chip habitat?

This image represents camouflage (also called protective coloration), which is an adaptation that helps animals survive. Snakes like this garter snake have evolved skin patterns and colors that match their environment. This happens over many generations through natural selection—snakes with coloring that matches their habitat are less likely to be spotted by predators or prey, so they survive and pass these helpful traits to their offspring. The snake's striped pattern mimics the lines and shadows created by dried plant material and wood chips.

Core Science Concepts

- Animal Adaptation: A snake's skin color, pattern, and texture are physical features that help it survive in its environment. These traits develop over many generations.

- Camouflage as a Survival Strategy: Animals blend into their habitats to hide from predators or sneak up on prey. The better an animal matches its environment, the more likely it is to survive.

- Scales and Skin Structure: Snakes are covered in scales—overlapping, protective pieces made of a special protein. Scales help the snake move, stay moist, and protect its body from damage.

- Habitat and Environment: The snake's appearance is closely connected to where it lives. Different habitats require different adaptations. This snake's striped pattern works well in grassy, woody areas.

Pedagogical Tip:

When teaching adaptation, avoid the misconception that animals "choose" to change or adapt on purpose. Instead, emphasize that over many, many generations, animals with helpful traits survive longer and have more babies, so those traits become more common in the population. This is the foundation of natural selection and evolution.

UDL Suggestions:

To support diverse learners: (1) Provide close-up images of scales and a non-camouflaged snake side-by-side for visual comparison; (2) Allow students to physically handle shed snake skin (if available from a local naturalist or pet store) to explore texture and scale patterns; (3) Offer a "Find the Snake" game with multiple difficulty levels—some images with the snake obvious, others well-camouflaged—so all students can participate at their level.

Discussion Questions

1. Why do you think this snake's stripes help it hide in this pile of wood chips? (Bloom's: Analyze | DOK: 2)

2. What would happen to a bright red snake living in this same habitat? Would it survive as well as the garter snake? (Bloom's: Evaluate | DOK: 3)

3. How are a snake's scales similar to the shingles on a roof? How do they help the snake? (Bloom's: Understand | DOK: 1)

4. If a garter snake lived in snow and ice instead of a grassy area, what color and pattern might help it survive there? (Bloom's: Create | DOK: 3)

Extension Activities

Activity 1: Camouflage Hunt
Create a classroom "habitat" by spreading wood chips, dried grass, and leaves on a table or floor. Hide several toy snakes or snake cutouts (some in matching colors, some in contrasting colors) throughout the habitat. Have students search for the snakes and observe which ones are easier or harder to find. Discuss: Why were some snakes harder to find? What colors and patterns worked best? This reinforces the relationship between animal appearance and survival.

Activity 2: Design Your Own Adapted Snake
Provide students with a large paper snake template and a habitat picture (desert, forest, snow, water, etc.). Students color their snake to match the habitat's colors and patterns, then explain in writing how their design helps the snake survive. Display adaptations and have classmates guess which habitat each snake lives in.

Activity 3: Scale Exploration
If possible, obtain a shed snake skin from a local nature center, museum, or reptile educator. (Shed skins are harmless and fascinating!) Pass it around so students can feel the texture, count scales, and observe how scales overlap. Alternatively, use close-up photographs or videos. Students can draw and label snake scales, then write about how scales protect the snake and help it move.

NGSS Connections

Performance Expectation:
4-LS1-1: Use evidence to construct an explanation that plants get the materials they need for growth chiefly from air and water. (Note: While this PE focuses on plants, the following DCIs and CCCs apply to this snake adaptation lesson)

Disciplinary Core Ideas:
- 3-LS3.B - Variations in traits: Many characteristics of organisms are inherited from their parents. Other characteristics result from individuals' interactions with the environment. (Foundation for understanding adaptation)
- 3-LS4.C - Adaptation: For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.
- 3-LS4.D - Biodiversity: There are many different kinds of living things in any area, and they exist in different places both in land and water.

Crosscutting Concepts:
- Patterns - The snake's striped pattern repeats and reflects patterns found in its natural habitat.
- Structure and Function - The snake's skin structure (scales) and coloration work together to provide protection and camouflage.
- Cause and Effect - Environmental pressures (predators, prey availability) cause animals to have specific adaptations.

Science Vocabulary

* Adaptation: A trait or behavior that helps an animal survive and thrive in its environment.

* Camouflage: Colors, patterns, or shapes that help an animal hide by blending into its surroundings.

* Scales: Small, hard, overlapping pieces of skin that cover and protect a snake's body.

* Habitat: The natural home or environment where an animal lives.

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

* Trait: A characteristic or feature of a living thing, like color, size, or shape.

External Resources

Children's Books:
- Sssssssss! A Book About S Sounds by Rebecca Stefoff (simple, rhyming introduction to snakes)
- Snakes by Seymour Simon (with stunning photographs and clear explanations; Fifth Grade level but accessible)
- Hide and Seek: Animals in Camouflage by Loretta Holland (explores camouflage across multiple animals)

YouTube Videos:
- "Snakes: A Quick Introduction" by National Geographic Kids (2:30 minutes; engaging, age-appropriate overview of snake adaptations and behavior)
  https://www.youtube.com/watch?v=G5D6Yp-xfyI

- "Camouflage: Master of Disguise" by TED-Ed (3:45 minutes; explores how animals use camouflage to survive, with clear animations)
  https://www.youtube.com/watch?v=z8n0K_PpfFI

Teacher Notes: This lesson scaffolds understanding of adaptation, a complex concept, by using a concrete, observable example. The garter snake's camouflage is visually obvious and engaging for Fourth Graders. Emphasize the long timescale of adaptation (many generations) and avoid teleological language (animals don't "try" to change). Connect this to students' own observations: Can they spot similar camouflage in insects or birds in their schoolyard?