

Photo Description



This image shows a snake camouflaged among dried corn stalks and wood chips in its natural environment. You can see the snake's scaled skin pattern blending in with the brown and tan colors of the surrounding debris, making it difficult to spot at first glance. The snake's body demonstrates how animals use their appearance to survive in the wild.

Scientific Phenomena

Anchoring Phenomenon: Camouflage—An Adaptation for Survival

This image represents camouflage, a survival adaptation where an organism's coloring, pattern, or shape helps it blend into its environment. Snakes have evolved coloration that matches their habitat because animals with better camouflage are more likely to survive and reproduce. Over many generations, this trait becomes more common in the population. The snake's tan and brown scales match the dried plant material, helping it hide from predators and stay undetected while hunting prey. This is a direct example of how organisms adapt to their specific environments through natural selection.

Core Science Concepts

- * **Adaptation:** A trait or characteristic that helps an organism survive and reproduce in its environment. This snake's coloring is an adaptation that increases its chances of survival.
- * **Camouflage:** A type of adaptation where an animal's appearance helps it blend in with its surroundings. Camouflage can involve color, pattern, or shape matching.
- * **Natural Selection:** The process where organisms with traits better suited to their environment are more likely to survive and pass those traits to their offspring. Snakes with better camouflage are more likely to survive.
- * **Biodiversity & Habitat:** Different organisms live in specific habitats where their adaptations help them thrive. Understanding that snakes belong in ecosystems helps students appreciate why we shouldn't harm them.

Pedagogical Tip:

When teaching adaptation, avoid saying animals "choose" or "decide" to change. Instead, use language like "over many generations" and "organisms with certain traits survive better." This reinforces the scientific accuracy of natural selection while remaining accessible to fifth graders. Consider using the phrase "useful traits" rather than "good traits" to encourage scientific thinking.

UDL Suggestions:

Provide multiple means of representation: Display high-quality close-up images of snake scales alongside habitat photos. Offer a tactile experience by allowing students to feel different textured materials (rough bark, smooth glass, bumpy fabric) while wearing blindfolds to simulate how camouflage works. For students with visual processing differences, describe the snake's location clearly ("left-center area, running horizontally") before asking them to locate it.

Zoom In / Zoom Out

Zoom In: Cellular & Molecular Level

At a microscopic level, the snake's skin is made up of thousands of tiny cells that produce pigments (colored chemicals). These pigment cells contain molecules that absorb and reflect different colors of light. The tan and brown colors we see are created by pigment molecules that reflect those wavelengths of light while absorbing others. Over many generations, snakes that inherited genes for producing "habitat-matching" pigments survived better, so these genes became more common in the population. Students can't see individual pigment cells with their eyes, but they're responsible for the camouflage pattern we observe!

Zoom Out: Ecosystem & Food Web Level

This single snake is part of a much larger ecosystem connected to many other organisms. The snake lives in a corn field (or similar agricultural habitat) where it hunts small rodents and insects that eat the plants. Predators like hawks and foxes hunt the snake. The dried corn stalks and wood chips provide shelter not just for the snake, but for hundreds of other small creatures. If we zoom out further, we see how human farming practices, weather patterns, and seasonal changes all affect whether this habitat supports snakes and their prey. Understanding the snake's adaptation helps us see how all organisms in an ecosystem depend on each other and their environment for survival.

Discussion Questions

1. Why do you think this snake's coloring is similar to the dried corn and wood chips around it? (Bloom's: Analyze | DOK: 2)
2. If this snake lived in a green forest with leaves and grass instead of dried stalks, how might its coloring be different, and why? (Bloom's: Evaluate | DOK: 3)
3. How would a snake's life be different if it had bright red and blue stripes instead of brown and tan coloring? (Bloom's: Evaluate | DOK: 3)
4. What other animals or plants do you know that use camouflage to survive? How does their camouflage work? (Bloom's: Apply | DOK: 2)

Potential Student Misconceptions

Misconception 1: "The snake changed its color to match the habitat."

Scientific Clarification: The snake didn't change its own color during its lifetime to match its surroundings. Instead, snakes with coloring that naturally matched this type of habitat were more likely to survive and have babies. Over many, many generations, snakes with better-matching colors became more common in this habitat. This is natural selection, not the snake's choice or ability to change.

Misconception 2: "Camouflage only helps animals hide from predators."

Scientific Clarification: While hiding from predators is one important use of camouflage, it also helps snakes hunt their prey! When a snake is camouflaged, small animals like mice and insects can't see it coming, making it easier for the snake to catch its food. Camouflage helps with both survival (avoiding being eaten) and feeding (catching meals).

Misconception 3: "All snakes in the same species look exactly the same."

Scientific Clarification: Even within one species of snake, individuals can have slightly different shades of brown, different pattern sizes, or different scale textures. This variation exists in all populations. Some snakes match their habitat better than others, and those with better camouflage are more likely to survive. This is why we see biodiversity even within a single species.

Extension Activities

Activity 1: Camouflage Hunt

Create a classroom "habitat" using craft paper or bulletin board paper in various colors (tan, brown, green, blue). Cut out small paper snakes in different colors and have students hide them in the habitat. Then challenge classmates to find the snakes. Discuss which colors were hardest to find and why. This hands-on experience reinforces how camouflage makes survival easier or harder.

Activity 2: Design Your Own Adapted Organism

Provide students with a specific habitat scenario (Arctic tundra, rainforest, desert, ocean) and have them design a fictional animal with adaptations suited to that environment. They should draw their organism, label its adaptations, and explain how each adaptation helps it survive. This encourages creative thinking while reinforcing adaptation concepts.

Activity 3: Adaptation Research Poster

Assign small groups different animals that use camouflage (leaf-tailed gecko, Arctic hare, grasshopper, flounder fish, walking stick insect) to research. Have them create a poster showing the animal, its habitat, and how its camouflage works. Groups can present findings to the class, building knowledge of diverse adaptations across species.

Cross-Curricular Ideas

ELA Connection: Descriptive Writing & Observation Journals

Have students write a detailed "field guide entry" describing the snake in the photo as if they were wildlife biologists. Challenge them to use sensory words (rough scales, earthy colors, still body) and explain the snake's adaptations in clear, scientific language. Students could then read their entries aloud and compare how different classmates described the same snake, reinforcing that observation and description are key scientific skills.

Math Connection: Camouflage Efficiency & Data Analysis

Conduct the "Camouflage Hunt" activity (from Extension Activities) and collect data on how long it takes students to find snakes of different colors in different habitats. Create bar graphs or picture graphs showing which colors were hardest to find in which habitats. Students can calculate percentages (e.g., "75% of snakes were found in under 30 seconds") and discuss what the data tells us about camouflage effectiveness.

Art Connection: Habitat & Adaptation Design

Have students create mixed-media artwork showing an organism and its habitat, emphasizing how the organism's appearance matches its environment. Provide natural materials (dried leaves, twigs, sand, bark) alongside colored paper and markers. Students can create a three-dimensional diorama or collage that demonstrates camouflage. This reinforces structure-function relationships while developing artistic skills.

Social Studies Connection: Human Impact on Habitats

Discuss how farming, construction, and development change natural habitats where snakes and other animals live. Show before-and-after photos of landscapes (forest to farmland, wetland to parking lot). Have students research how habitat loss affects snakes and other wildlife in your region. They could write a persuasive letter to local officials about protecting natural spaces, connecting science to civic responsibility and community stewardship.

STEM Career Connection

Herpetologist (Reptile & Amphibian Scientist)

Herpetologists study reptiles like snakes, lizards, turtles, and amphibians like frogs. They observe animals in the wild or in laboratories to understand how they survive, what they eat, how they reproduce, and how they're affected by environmental changes. Some herpetologists work to protect endangered snake species or teach people that snakes are helpful animals, not dangerous ones. They might work in zoos, universities, nature centers, or for government wildlife agencies. Average Salary: \$45,000–\$65,000 per year

Wildlife Habitat Specialist

Wildlife habitat specialists design and manage natural areas to support animals like snakes and their prey. They might restore wetlands, plant native vegetation, remove invasive species, or create wildlife corridors so animals can move safely between habitats. They use science to understand what each animal needs to survive and then work with landowners and communities to protect those spaces. Average Salary: \$42,000–\$58,000 per year

Ecologist

Ecologists study how organisms interact with each other and their environment—like how snakes fit into food webs, how camouflage affects survival rates, or how habitat changes affect animal populations. They collect data in the field, analyze it, and write reports that help governments and organizations make decisions about protecting nature. Some ecologists work for universities, government agencies, or conservation nonprofits. Average Salary: \$50,000–\$75,000 per year

NGSS Connections

Performance Expectation:

5-LS4-1: Analyze and interpret data from fossils to support an explanation for changes in organisms over time. (Note: While this PE focuses on fossils, the image supports the broader standard about adaptation and evolution.)

Disciplinary Core Ideas:

- 5-LS3.A Inheritance of Traits—Organisms have traits inherited from parents; camouflage traits are passed down through generations.
- 5-LS4.A Variation of Traits—Different individuals within a species have different trait variations; some snakes are lighter or darker.
- 5-LS4.C Adaptation—Organisms have adaptations that help them survive in their environment.

Crosscutting Concepts:

- Patterns — Camouflage patterns match environmental patterns.
- Structure and Function — A snake's scale structure and coloring serve the function of survival.
- Cause and Effect — Environmental pressures cause organisms to develop specific adaptations over time.

Science Vocabulary

- * Adaptation: A special trait or behavior that helps an organism survive and reproduce in its environment.
- * Camouflage: Coloring, patterns, or shapes that help an animal blend in and hide in its surroundings.
- * Natural Selection: The process where organisms with helpful traits are more likely to survive, reproduce, and pass those traits to their young.
- * Scale: A small, flat plate that covers and protects a snake's skin.
- * Predator: An animal that hunts and eats other animals for food.
- * Habitat: The place where an organism lives that provides food, water, shelter, and space.

External Resources

Children's Books:

- Snakes by Gail Gibbons (informative picture book with detailed illustrations of snake anatomy and behavior)
- The Snake Book by Angela Wilkes (interactive exploration of snake adaptations and habitats)
- Camouflaged Creatures by Janet Halfmann (explores camouflage across multiple animal species)

Teacher's Note: This lesson uses a real-world phenomenon (a snake in its habitat) to build understanding of adaptation as a survival strategy. By grounding abstract concepts in observable evidence, you help students develop scientific reasoning skills aligned with fifth-grade standards.