

## Photo Description



This image shows a snake slithering across dried corn stalks and wood mulch on the ground. You can see the snake's scaly skin with a pattern of light and dark colors that helps it blend in with its surroundings. The snake's long, thin body is perfectly shaped for moving through grass, leaves, and other natural materials in its habitat.

## Scientific Phenomena

Anchoring Phenomenon: Why does a snake have scales and patterns on its skin?

Snakes have scales and special skin patterns for two important reasons. First, scales are tough, overlapping layers that protect the snake's body and help it move smoothly across rough ground, rocks, and plants. Second, the snake's coloring and patterns help it hide from predators and sneak up on prey—this is called camouflage. The brown and tan colors in this photo match the dead leaves and wood, making the snake hard to see. This is an example of how animals' body features help them survive in their environment.

## Core Science Concepts

1. Animal Adaptations: Snakes have special body features (scales, patterns, body shape) that help them live in their environment and survive.
2. Camouflage and Survival: The snake's coloring helps it blend in with dead leaves and wood, protecting it from predators and helping it hunt for food.
3. Skin and Protection: Scales are a special covering that protects the snake's body, keeps it from drying out, and helps it move through its habitat.
4. Habitats and Living Things: Snakes live in places with shelter like leaf piles, fallen wood, and thick grass where they can hide and find food.

### Pedagogical Tip:

Second graders learn best through observation and direct experience. Before showing this image, consider having students observe pictures or videos of snakes in their natural habitats multiple times. This repeated exposure helps them notice details like scale patterns and color variations. Encourage students to draw what they observe—drawing is a powerful tool for developing observational skills at this age.

### UDL Suggestions:

To support diverse learners, provide multiple ways to explore this concept: (1) Representation: Show high-quality images and videos of snakes in different habitats; use tactile models or textured materials so students can feel scales; (2) Action/Expression: Allow students to demonstrate understanding by creating camouflaged animals using colored paper, moving like snakes, or sorting animal pictures by habitat; (3) Engagement: Connect to student interests by asking "Where might you find a snake in YOUR neighborhood?" and celebrating all correct answers.

## Zoom In / Zoom Out

### Zoom In: Inside the Snake's Skin

If we could use a special microscope to look very, very close at a snake's scales, we would see that each scale is made of tiny cells all packed together. Under the scales, there is skin underneath, just like you have skin under your fingernails! The scales are made of a material called keratin (the same stuff your fingernails are made of). These tiny cells work together to create a hard, waterproof layer that keeps the snake safe and stops it from drying out. Scientists who study snakes under microscopes can see patterns in the cells that help them identify different snake species!

### Zoom Out: The Snake in Its Ecosystem

This snake is part of a much bigger living community called an ecosystem. The snake eats small animals like mice, insects, and other creatures. At the same time, larger animals like hawks, owls, and foxes hunt the snake for food. The dead leaves, wood, and plants in this habitat provide shelter and hunting grounds for the snake. When the snake dies, it becomes part of the soil and helps plants grow. The snake is connected to everything around it—the plants provide shelter, the animals it eats give it energy, and predators keep the snake population balanced. This whole system depends on each living thing doing its job!

## Discussion Questions

1. Why do you think this snake's colors are brown and tan instead of bright red and yellow? (Bloom's: Analyze | DOK: 2)
2. What does this snake need to survive in its habitat, and how do its scales help it? (Bloom's: Understand | DOK: 2)
3. If this snake lived in the snow instead of near leaves, how might its appearance be different to help it survive? (Bloom's: Evaluate | DOK: 3)
4. What other animals do you know that have special colors or patterns to hide in their environment? (Bloom's: Remember | DOK: 1)

## Potential Student Misconceptions

### Misconception 1: "Snakes are slimy."

Clarification: Many second graders think snakes feel wet and slimy like frogs or fish. In reality, snake scales are dry and smooth, almost like the texture of a leather belt or a basketball. Scales help keep the snake's moisture inside so it doesn't dry out. If students have the opportunity to feel a snake (safely, under adult supervision) or touch a textured model, they'll discover that snakes feel quite different from what they imagined!

### Misconception 2: "Snakes are mean or dangerous and should be killed."

Clarification: Second graders often fear snakes and think they're all dangerous. The truth is that most snakes are shy and try to avoid people. Snakes are actually very helpful because they eat rodents that can damage crops and spread disease. Snakes are an important part of nature, and we should respect them and let them live safely in their habitats.

### Misconception 3: "A snake's pattern stays the same its whole life."

Clarification: While a snake's basic color pattern doesn't change dramatically, snakes shed their skin several times a year as they grow. After shedding, the new scales underneath are often brighter and clearer until they age. Some students might think the pattern disappears or completely changes; help them understand that shedding is a natural process that helps snakes grow and stay healthy.

## Extension Activities

1. Camouflage Hunt: Hide pictures of animals around the classroom with backgrounds that match their colors (e.g., a green frog on green paper, a brown rabbit on brown paper). Have students search for the hidden animals and discuss why they were hard to find. Then, repeat the activity with mismatched backgrounds (e.g., green frog on red paper) to show how camouflage protects animals.
2. Design Your Own Snake: Provide students with paper strips, markers, and colored pencils. Have them design a snake that would blend into a specific habitat you choose (forest, desert, grass, snow). Students draw the snake and then place it on a background to show how well it hides. Display all designs and discuss which ones have the best camouflage.
3. Texture Exploration: Collect safe, tactile materials (tree bark, sandpaper, fabric, plastic scales, etc.) that show different textures. Have students touch each material and discuss how snake scales feel similar to some of these textures. Then, create a "Scale Feel Box" where students reach in without looking and guess what material they're touching, connecting texture to snake adaptations.

## Cross-Curricular Ideas

### Math Connection: Measuring and Comparing

Have students measure the length of the snake in the photo using a ruler or string, then compare it to familiar objects in their classroom (pencils, their arm span, the classroom door). Create a simple bar graph showing "How Long Are Different Animals?" by comparing snake length to other animals like worms, lizards, and snakes of different species. This builds measurement skills and number sense while reinforcing animal facts.

### ELA Connection: Story and Description Writing

After observing the photo, have students write or dictate a short story titled "A Day in the Life of a Snake" or create descriptive sentences using sensory words (rough scales, hidden in leaves, quick movements, brown colors). Students can illustrate their writing and share it with the class. This combines science observation with creative writing and vocabulary development.

### Art Connection: Camouflage Collage

Provide students with torn pieces of brown, tan, and gray paper or magazine cutouts of natural materials. Have them create a collage background that represents a snake's habitat, then cut out a snake shape and glue it on top. Challenge them to make the snake "disappear" as much as possible into the background. Display finished artwork and discuss which snakes are hardest to see and why their camouflage is most effective.

### Social Studies Connection: Where in the World?

Show students a world map and discuss where different snakes live (deserts, forests, grasslands, swamps). Have students mark on a simple map where snakes are found and talk about how people in different parts of the world interact with snakes differently. This builds geography awareness and cultural understanding while reinforcing habitat concepts from science.

## STEM Career Connection

### Herpetologist (Her-puh-TAH-luh-jist)

A herpetologist is a scientist who studies snakes, lizards, frogs, and other reptiles and amphibians. These scientists observe how snakes move, what they eat, where they live, and how they survive in different habitats. They might work at zoos, nature centers, universities, or in the wild to protect snakes and teach people that snakes are helpful and important. Some herpetologists even discover brand-new snake species that no one has ever seen before!

Average Annual Salary: \$45,000–\$65,000 USD

### Zoo Keeper or Wildlife Educator

Zoo keepers take care of snakes and other animals at zoos and nature centers. They feed the snakes, clean their habitats, keep them healthy, and teach visitors (like you!) all about why snakes are amazing and how to respect them. Zoo keepers help people understand that snakes are not scary—they're fascinating creatures with special adaptations. Some zoo keepers also help rescue injured wild snakes and release them safely back into nature.

Average Annual Salary: \$28,000–\$38,000 USD

### Wildlife Biologist

A wildlife biologist studies how animals like snakes live in nature and how they fit into their ecosystems. They count snakes in forests, track where they go, study what they eat, and figure out how to protect them when their habitats are in danger. Wildlife biologists might work for state parks, national forests, or environmental organizations to make sure snakes and all wildlife have safe places to live.

Average Annual Salary: \$48,000–\$70,000 USD

## NGSS Connections

### Performance Expectation:

2-LS1-1: Plan and conduct investigations to provide evidence that plants get the energy they need to grow chiefly from light energy. (Note: This standard focuses on adaptations and animal structures that help survival.)

### Relevant Standard:

K-LS1-1: Use observations to describe patterns of what plants and animals need to survive.

### Disciplinary Core Ideas:

- 2-LS2.A - Food Webs (snakes are predators in food webs)
- 3-LS3.B - Variation of Traits (snake color and pattern variations)
- 3-LS4.C - Adaptation (scales, camouflage, body shape)

### Crosscutting Concepts:

- Structure and Function - Scales help snakes move and stay protected
- Patterns - The pattern on the snake's skin matches its environment

## Science Vocabulary

\* Scales: Tiny, tough, flat pieces that overlap on a snake's skin to protect its body and help it move.

\* Camouflage: Colors and patterns on an animal's body that help it blend in with its surroundings so it can hide or hunt.

\* Adaptation: A special body part or behavior that helps an animal survive in its home.

\* Habitat: The natural home or place where an animal lives and finds food and shelter.

\* Pattern: Repeated shapes, colors, or marks that you can see on an animal's skin or fur.

## External Resources

### Children's Books:

- Snakes by Gail Gibbons (nonfiction introduction to snakes)
- The Year of the Snake by Theresa Volpe Holley (story with facts about snakes)
- National Geographic Little Kids First Big Book of Animals (includes snake section)

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Teacher's Note: This lesson connects directly to students' natural curiosity about animals and their environment. Second graders benefit from seeing real snakes (if available through a local nature center or zoo visit) or high-quality videos. Always prioritize safety and emphasize that snakes are important parts of nature and shouldn't be harmed.