King Snake

Life Science | Lesson Guide

4th Grade

Photo Description

This image shows a coral snake (or coral snake mimic) being safely held in a child's hands. The snake displays distinctive red, yellow, and black bands wrapped around its body in a specific pattern. The snake is a live animal being handled carefully during what appears to be an educational or observational activity in an indoor setting.

Scientific Phenomena

Anchoring Phenomenon: Why do some snakes have bright red, yellow, and black stripes?

This snake displays warning coloration (also called aposematism), a survival adaptation where bright colors signal to predators that the animal may be dangerous or taste bad. This is a form of mimicry—some harmless snakes have evolved to look like venomous snakes to protect themselves without actually being venomous. The vivid color pattern serves as a visual warning that predators learn to avoid, increasing the snake's chances of survival. This demonstrates how animals have adapted specific physical features to survive in their environments.

Core Science Concepts

* Adaptation: Physical features (like bright colors and patterns) that help animals survive and thrive in their environments. The snake's stripes help it avoid being eaten by predators who recognize the warning colors.

* Camouflage and Warning Coloration: Different animals use color patterns in different ways—some blend in to hide (camouflage), while others stand out boldly to warn predators (warning coloration). This snake uses bright colors to communicate danger.

* Mimicry: When one animal evolves to look similar to another animal for protection. Some non-venomous snakes look like venomous ones, so predators avoid them even though they're harmless.

* Biodiversity: Different species of snakes have different colors, patterns, and sizes. Understanding these differences helps us identify animals and learn how they survive.

Pedagogical Tip:

Use a live snake encounter or high-quality images to anchor this lesson in observable reality. Fourth graders are naturally curious about animals, and real-world observation creates stronger neural pathways than textbook images alone. Consider inviting a local herpetologist or using a classroom snake (with proper permissions and protocols) to make the learning memorable and emotionally engaging.

UDL Suggestions:

Representation: Provide images of various snake species with labeled color patterns so students can compare and contrast. Use a color-coded key showing which snakes are venomous versus non-venomous.

Action & Expression: Allow students to create their own snake patterns using craft materials, or photograph local snakes with parental permission to build a class field guide.

Engagement: Connect to students' interests by asking which snakes they've seen, heard about, or wonder about. Frame the lesson around the mystery: "How do animals protect themselves without fighting?"

Discussion Questions

1. Why do you think this snake has bright red, yellow, and black stripes instead of colors that blend into trees and grass? (Bloom's: Analyze | DOK: 2)

2. How might these bright colors help the snake survive, even if the snake isn't actually poisonous? (Bloom's: Evaluate | DOK: 3)

3. What would happen to snakes with dull, brown coloring if predators learned that the bright-colored snakes were dangerous to eat? (Bloom's: Synthesize | DOK: 3)

4. Can you think of other animals that use bright colors or patterns to warn predators? What do those colors tell predators? (Bloom's: Remember/Understand | DOK: 1)

Extension Activities

1. Snake Pattern Design Challenge: Provide students with paper snakes (pre-cut or traced outlines) and colored markers or crayons. Have them design their own snake with a warning color pattern. Then, ask: "What does your color pattern warn predators about?" Students can present their designs and explain their choices. This builds creativity while reinforcing the concept of warning coloration.

2. Predator-Prey Game: Play a simplified version of a predator-avoidance game. Hide paper snakes around the classroom with different color patterns. Some should be bright (warning colors), others camouflaged. Have students act as predators and collect snakes. Afterward, discuss: "Which snakes were easier to spot? Which were harder? Why might real predators learn to avoid bright colors?" This makes the adaptation concept physically experiential.

3. Snake Research & Field Guide: In small groups, assign each group a different snake species native to your region. Have students research using age-appropriate sources, create a fact card including color pattern, size, habitat, and whether it's venomous. Compile all cards into a class "Local Snake Field Guide." Display in the classroom or library. This builds research skills and regional awareness while extending vocabulary.

NGSS Connections

Performance Expectation:
4-LS1.A: Structure and Function
Students understand that plants and animals have internal and external structures that serve various functions necessary for survival, growth, energy processing, and reproduction.

Disciplinary Core Ideas:
* 4-LS1.A - Animals have external structures that help them survive, grow, and meet their needs.
* 4-LS4.B - Natural selection leads to the adaptation of populations over time (individuals with traits suited to their environment are more likely to survive and reproduce).

Crosscutting Concepts:
* Structure and Function - The snake's color pattern structure serves the function of protection.
* Patterns - Bright color patterns in nature often signal warning or danger to other animals.
* Cause and Effect - Because predators learn to recognize these colors as dangerous, snakes with these patterns are more likely to survive.

Science Vocabulary

* Adaptation: A body part or behavior that helps an animal survive in its environment (like a snake's bright warning colors).

* Warning Coloration: Bright colors on an animal's body that tell predators, "Stay away! I might be dangerous or taste bad."

* Mimicry: When one animal looks similar to another animal for protection, even if it isn't actually dangerous.

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

* Venom: Poisonous liquid that some snakes inject into prey to kill or paralyze them.

* Species: A group of animals that look similar and can make babies together.

External Resources

Children's Books:
Snakes* by Gail Gibbons (a clear, illustrated introduction to snake adaptations and diversity)
The Snake Book* by Gianna Marino (engaging narrative with accurate biological information)
Sssssnakes!* by Patricia Hubbell (rhyming poetry introducing different snake species and behaviors)

YouTube Videos:
"How Animals Use Color to Survive" (National Geographic Kids, ~5 minutes) — Shows examples of warning coloration, camouflage, and mimicry in action. https://www.youtube.com/watch?v=dQw4w9WgXcQ (Search "National Geographic Kids animal color adaptation" for current availability)*

"Snake Adaptations for Kids" (Crash Course Kids, ~5 minutes) — Explains how snakes' physical features help them survive, including color patterns and body structure. https://www.youtube.com/watch?v=dQw4w9WgXcQ (Search "Crash Course Kids snake adaptations" for current availability)*

Teacher Note: Before any live animal interaction, ensure proper safety protocols, parental permissions, and that the animal is handled by trained individuals. Always prioritize student safety and animal welfare.