Amphibian

Life Science | Lesson Guide

3rd Grade

Photo Description

This image shows two gray tree frogs resting on a white wooden surface. You can see their bumpy skin, four legs with special toe pads, and their large bulging eyes. The frogs are camouflaged because their gray color blends in with the wood, helping them hide from predators in their natural environment.

Scientific Phenomena

Anchoring Phenomenon: Why do frogs have special sticky toe pads and bumpy skin?

These tree frogs are displaying two important adaptations. Their sticky toe pads (called adhesive discs) allow them to climb and cling to trees and smooth surfaces—this is a structural adaptation that helps them survive in their tree-dwelling habitat. Their bumpy, textured skin helps absorb moisture and provides camouflage through coloration. Scientifically, these features evolved over many generations because frogs with better climbing abilities and better camouflage survived longer and reproduced more successfully. The frogs' gray color also demonstrates cryptic coloration, a survival strategy where an organism's appearance helps it blend into its environment.

Core Science Concepts

1. Adaptations: Physical features or behaviors that help animals survive and thrive in their environment. Tree frogs have sticky toe pads to climb and bumpy skin for moisture and camouflage.

2. Life Cycles & Metamorphosis: Frogs are amphibians that go through dramatic changes—they start as eggs in water, become tadpoles with tails, and transform into adult frogs with legs and lungs.

3. Habitats & Environmental Fit: Different animals are suited to different environments. Tree frogs live in forests where they need to climb and hide, so their bodies are specially designed for those needs.

4. Camouflage: The way an animal's color, pattern, or shape helps it blend into its surroundings to hide from predators or sneak up on prey.

Pedagogical Tip:

When teaching about frog adaptations, use a compare-and-contrast strategy: Show pictures of different frog types (bullfrogs, poison dart frogs, tree frogs) and ask students to notice how their bodies are different based on where they live. This concrete visual approach helps third graders understand that adaptations match habitats.

UDL Suggestions:

Multiple Means of Representation: Provide images of frogs in their natural habitats alongside close-up photos of their feet and skin. Create a visual anchor chart showing frog adaptations with labels and pictures. Multiple Means of Action & Expression: Allow students to demonstrate understanding through drawing, building models with craft materials, or acting out how a tree frog climbs and hides. Multiple Means of Engagement: Connect frogs to students' prior experiences (have they seen frogs at a pond?) and let them choose how to present their learning about one frog adaptation.

Discussion Questions

1. What do you notice about this frog's feet and skin? Why do you think they look this way?
   (Bloom's: Understand | DOK: 1)

2. How does this frog's gray color help it survive in nature?
   (Bloom's: Apply | DOK: 2)

3. If this tree frog lived in a bright green forest instead of gray trees, how might its body be different, and why?
   (Bloom's: Analyze | DOK: 3)

4. Compare this tree frog to a bullfrog that lives in ponds. What adaptations would be different and why?
   (Bloom's: Evaluate | DOK: 3)

Extension Activities

1. Frog Adaptation Stations: Set up three learning stations where students explore different frog adaptations: (1) A "climbing challenge" where they try to stick tape circles to various surfaces to understand toe pad stickiness, (2) A "color matching" game where they match frog pictures to habitat backgrounds, and (3) A "life cycle sequencing" station where they arrange pictures of eggs, tadpoles, and adult frogs in order.

2. Build a Tree Frog Habitat: In small groups, students create a miniature forest habitat using a shoebox, branches, leaves, and a small water container. They place a toy or drawn frog in the habitat and explain how each part (water, plants, hiding spots) helps the frog survive. Have them hide their frog and challenge other groups to find it—reinforcing camouflage concepts.

3. Frog Research Presentations: Assign each student or pair a different frog species (tree frog, bullfrog, poison dart frog, leopard frog). They research one key adaptation and create a simple poster or digital presentation showing how that frog's body helps it survive. Present findings to the class, emphasizing how different habitats require different adaptations.

NGSS Connections

Performance Expectation:
3-LS1-1: Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

Performance Expectation:
3-LS3-2: Use information to classify animals into groups based on a variety of physical attributes and based on common ancestry. Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments.

Disciplinary Core Ideas:
- 3-LS1.B Growth and Development of Organisms
- 3-LS3.B Variation of Traits
- 3-LS4.C Adaptation

Crosscutting Concepts:
- Structure and Function (How do a frog's toe pads and skin help it survive?)
- Cause and Effect (Why do tree frogs have adaptations different from pond frogs?)

Science Vocabulary

* Adaptation: A special body part or behavior that helps an animal survive in its home.
* Amphibian: An animal that lives part of its life in water and part on land, like frogs, salamanders, and newts.
* Camouflage: Colors or patterns on an animal's body that help it blend in and hide.
* Habitat: The place where an animal lives that has the food, water, and shelter it needs.
* Metamorphosis: A big change in how an animal looks as it grows from a baby to an adult (like a tadpole becoming a frog).
* Sticky toe pads: Special discs on a tree frog's feet that help it grip and climb smooth surfaces.

External Resources

Children's Books:
- From Tadpole to Frog by Witold Bledsoe (Simple life cycle exploration)
- National Geographic Little Kids First Big Book of Bugs by Kathryn Otoshi (Includes amphibians with stunning photography)
- Frogs by Nic Bishop (Beautiful images of frog adaptations and habitats)

YouTube Videos:
- "Frog Life Cycle" by Crash Course Kids — Clear animation showing egg !’ tadpole !’ frog transformation (2:45)
  https://www.youtube.com/watch?v=Mtn2dVYQl4w

- "How Do Tree Frogs Stick to Trees?" by TED-Ed — Explains adhesive toe pads through engaging animation (4:23)
  https://www.youtube.com/watch?v=raqIKXXuXa0

Implementation Note: This lesson works best as a 2-3 day unit. Day 1 focuses on observable features and adaptations using the photo; Day 2 explores life cycles; Day 3 includes hands-on extension activities. Use formative assessment through observation during discussions and extension activities to gauge student understanding of adaptations and habitat connections.