Anole

Life Science | Lesson Guide

4th Grade

Photo Description

This lizard is showing off its bright orange throat flap called a dewlap. The lizard has gray and brown spotted skin that helps it blend in with rocks and dirt. When the dewlap is extended, it creates a colorful display that other lizards can see from far away.

Scientific Phenomena

The Anchoring Phenomenon is animal communication through visual displays. This lizard is extending its dewlap (throat flap) as a form of communication, likely to establish territory, attract a mate, or warn competitors. The bright coloration contrasts sharply with the lizard's camouflaged body, making it highly visible when displayed but easily hidden when retracted. This behavior demonstrates how animals use specialized body structures and behaviors to send specific messages to other members of their species.

Core Science Concepts

1. Animal Communication: Animals use different body parts and behaviors to send messages to other animals of the same species
2. Adaptation: The dewlap is a specialized structure that helps the lizard survive by communicating without making sounds that might attract predators
3. Camouflage vs. Display: The lizard's body shows two opposite survival strategies - blending in with gray/brown coloration and standing out with bright orange signaling
4. Structure and Function: The dewlap's design (bright color, extendable flap) directly relates to its job of visual communication

> **Pedagogical Tip:**
>
> Have students practice extending and retracting their own "dewlaps" using colored paper fans to understand how this structure can be hidden or displayed as needed.

> **UDL Suggestions:**
>
> Provide multiple ways for students to demonstrate understanding by allowing them to create visual displays (drawings), physical demonstrations (acting out dewlap displays), or written explanations of how the lizard communicates.

Zoom In / Zoom Out

1. Zoom In: At the cellular level, specialized muscles control the extension and retraction of the dewlap, while pigment cells called chromatophores contain the orange coloration that makes the display so visible.

2. Zoom Out: This communication behavior connects to the larger ecosystem where multiple species compete for territory, mates, and resources, and efficient communication helps maintain population balance and reduce unnecessary physical conflicts.

Discussion Questions

1. "What advantages might a lizard have by using visual signals instead of sounds to communicate?" (Bloom's: Analyze | DOK: 3)

2. "How do you think the lizard's dewlap display compares to ways humans communicate without words?" (Bloom's: Compare | DOK: 2)

3. "What would happen if all the lizards in an area had the exact same dewlap color and pattern?" (Bloom's: Hypothesize | DOK: 3)

4. "Why might it be important for the lizard to be able to hide its dewlap when not using it?" (Bloom's: Evaluate | DOK: 2)

Potential Student Misconceptions

1. Misconception: "The lizard is angry or trying to hurt something."
Clarification: The dewlap display is communication, not aggression. It's more like waving hello or putting up a sign than fighting.

2. Misconception: "All lizards have the same colored dewlaps."
Clarification: Different lizard species have different colored dewlaps, and sometimes only males have bright colors while females have different patterns.

3. Misconception: "The dewlap stays out all the time."
Clarification: Lizards can control when to show their dewlap, extending it only when they need to communicate, then hiding it for camouflage.

Cross-Curricular Ideas

1. ELA - Animal Communication Stories: Have students write a short narrative from the perspective of the lizard, describing what message it's trying to send with its dewlap display. Students can create dialogue between two lizards communicating with each other, integrating descriptive language about colors and movements.

2. Art - Color Mixing and Design: Students can experiment with mixing paints or colored pencils to match the orange, yellow, and red colors of the anole's dewlap. They can then design their own imaginary animal "signal flap" with unique colors and patterns, explaining what message their design would communicate.

3. Math - Measurement and Comparison: Students can measure the length and width of the lizard's body compared to the size of its extended dewlap using a ruler or comparative ratios. They can create bar graphs comparing dewlap sizes across different lizard species shown in pictures.

4. Social Studies - Animal Territories and Communities: Connect the lizard's territorial communication to human communities by discussing how people use signs, flags, and symbols to mark territory and communicate important messages (street signs, flags, logos). Students can research how different cultures use visual symbols to communicate.

STEM Career Connection

1. Herpetologist (Reptile Scientist): A herpetologist is a scientist who studies reptiles and amphibians like lizards, snakes, and frogs. They observe how these animals behave in nature, learn about their communication methods, and work to protect their habitats. Some herpetologists work in zoos, museums, or universities. Average Salary: $54,000 - $65,000 per year

2. Animal Behaviorist: An animal behaviorist studies how animals act and communicate with each other. They watch animals in the wild or in controlled settings to understand why animals do certain things, like displaying their dewlaps. This helps scientists understand animal needs and create better care for animals in zoos and sanctuaries. Average Salary: $48,000 - $70,000 per year

3. Wildlife Photographer: A wildlife photographer takes pictures and videos of animals in nature to share with the world. They need patience, good camera skills, and knowledge about animal behavior to capture amazing moments like an anole displaying its dewlap. Their photos help people learn about and care about protecting animals and their habitats. Average Salary: $38,000 - $75,000 per year

NGSS Connections

- Performance Expectation: 4-LS1-2: Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways
- Disciplinary Core Ideas: 4-LS1.D Information Processing
- Crosscutting Concepts: Structure and Function, Systems and System Models
- Science and Engineering Practices: Developing and Using Models

Science Vocabulary

* Dewlap: A flap of skin under an animal's throat that can be extended to show bright colors for communication
* Adaptation: A special feature or behavior that helps an animal survive in its environment
* Camouflage: Colors or patterns that help an animal blend in with its surroundings
* Territory: An area that an animal claims and defends as its own space
* Visual display: Using body movements, colors, or shapes to send messages to other animals
* Species: A group of animals that are similar and can have babies together

External Resources

Children's Books:
- Lizards by Nic Bishop
- What Do You Do With a Tail Like This? by Steve Jenkins and Robin Page
- National Geographic Readers: Lizards by Laura Marsh