Pelican

Life Science | Lesson Guide

3rd Grade

Photo Description

This brown pelican sits on a wooden post near the ocean. It has a huge yellow and black beak that looks like a big pouch. The bird's body is covered in gray and brown feathers, and it has webbed feet for swimming.

Scientific Phenomena

The anchoring phenomenon shown here is structural adaptation for survival. This pelican's enormous beak with its expandable throat pouch (called a gular pouch) is specifically designed for its feeding strategy. When pelicans dive into water, the pouch expands to scoop up fish and water - up to 3 gallons! The bird then drains the water out while keeping the fish inside. This specialized structure allows pelicans to be highly successful fish-eating birds in coastal environments.

Core Science Concepts

1. Body structures help animals survive - The pelican's large beak pouch, webbed feet, and waterproof feathers are all adaptations that help it catch fish and live near water.

2. Animals have different feeding strategies - Pelicans are plunge-divers that use their specialized beaks to scoop fish from the water, unlike other birds that might hunt differently.

3. Habitat shapes animal features - Coastal and marine environments have influenced the pelican's evolution, resulting in features perfect for ocean fishing.

4. Form follows function in nature - Every part of the pelican's body has a specific job that helps it survive in its environment.

Pedagogical Tip:

Use hand gestures and body movements when teaching about pelican adaptations. Have students cup their hands to mimic the pelican's pouch or pretend to dive like a pelican. This kinesthetic approach helps cement understanding of structure-function relationships.

UDL Suggestions:

Provide multiple ways for students to show their understanding of animal adaptations: drawing and labeling pelican parts, acting out feeding behaviors, creating a pelican fact book, or building a model pelican beak. This allows students with different strengths to demonstrate their learning.

Zoom In / Zoom Out

1. Zoom In: The pelican's feathers have a microscopic structure with tiny barbs and hooks that lock together, creating a waterproof barrier. Special oil glands near the tail produce oil that the pelican spreads on its feathers during preening to maintain waterproofing.

2. Zoom Out: Pelicans are part of coastal food webs, helping control fish populations while serving as indicators of ocean health. Their presence signals a healthy marine ecosystem, and their nesting colonies contribute to nutrient cycling on coastal islands through their droppings.

Discussion Questions

1. How does the pelican's beak help it get food that other birds cannot catch? (Bloom's: Analyze | DOK: 2)

2. What would happen if a pelican tried to live in a desert instead of near the ocean? (Bloom's: Evaluate | DOK: 3)

3. Which body parts of this pelican are most important for its survival, and why? (Bloom's: Evaluate | DOK: 3)

4. How are a pelican's feet different from a robin's feet, and why? (Bloom's: Compare | DOK: 2)

Potential Student Misconceptions

1. Misconception: "Pelicans store food in their pouches like chipmunks store nuts in their cheeks."
   Reality: Pelicans use their pouches only for catching fish, then swallow the fish right away. The pouch is not a storage container.

2. Misconception: "All birds that live near water look the same."
   Reality: Water birds have many different adaptations - pelicans have pouches, ducks have flat bills, and herons have long thin beaks, each designed for different ways of getting food.

3. Misconception: "The pelican's beak is just really big for no reason."
   Reality: The large beak with its pouch is perfectly designed for the pelican's diving and scooping feeding strategy.

Cross-Curricular Ideas

1. Math - Measurement & Data: Have students measure the length of a pelican's beak using string or rulers, then compare it to other bird beaks (like a robin or hummingbird). Create a simple bar graph showing beak lengths of different birds. This connects to 3.MD.B.3 (representing and interpreting data).

2. ELA - Informational Writing: Students write a "Day in the Life of a Pelican" narrative, describing what the bird does from sunrise to sunset using their knowledge of pelican adaptations and behaviors. They can illustrate their writing with labeled diagrams, connecting to 3.W.3 (narrative writing).

3. Social Studies - Coastal Communities: Explore how pelicans and fishing are connected to coastal towns and economies. Discuss why some communities have pelicans in their area and how these birds are protected by laws. Students can locate coastal regions on a map where pelicans live.

4. Art - Nature Observation Drawing: Students create detailed sketches of the pelican's features, focusing on the beak, feathers, and feet. They can use colored pencils to show the color patterns and then label the adaptations they observe, combining art with scientific observation skills.

STEM Career Connection

1. Wildlife Biologist: Wildlife biologists study animals like pelicans in their natural habitats. They watch how birds live, what they eat, and how they survive. They help protect birds and their homes (habitats) so pelicans and other animals stay healthy. They might work near oceans, in nature centers, or for organizations like the National Audubon Society. Average Salary: $63,000 USD/year

2. Ornithologist (Bird Scientist): An ornithologist is a special scientist who studies birds. They learn everything about how birds are built, why they have different beaks and feathers, and how they raise their babies. Some ornithologists travel the world watching birds and taking pictures to understand them better. Average Salary: $65,000 USD/year

3. Conservation Officer: Conservation officers protect animals and natural areas like beaches and wetlands where pelicans live. They make sure people follow rules that keep animals safe, and they help remove trash from habitats so birds can live healthy lives. Average Salary: $58,000 USD/year

NGSS Connections

- Performance Expectation: 3-LS4-3: Construct an argument that some animals form groups that help members survive.
- Disciplinary Core Ideas: 3-LS4.C - Environmental changes affect organisms, and 3-LS4.B - Sometimes differences give individuals advantages in surviving and reproducing
- Crosscutting Concepts: Structure and Function and Cause and Effect

Science Vocabulary

* Adaptation: A special body part or behavior that helps an animal survive in its home.
* Habitat: The natural place where an animal lives and gets everything it needs.
* Webbed feet: Toes connected by skin flaps that help birds swim and walk on sand.
* Gular pouch: The stretchy throat bag that pelicans use to scoop up fish.
* Predator: An animal that hunts and eats other animals for food.
* Waterproof: Something that keeps water from getting through, like a raincoat.

External Resources

Children's Books:
- Pelican by Edith Thacher Hurd
- About Birds: A Guide for Children by Cathryn Sill
- Beaks! by Sneed Collard III