

## 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.

### 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

### YouTube Videos:

- "Brown Pelican Plunge Diving" - Amazing slow-motion footage showing how pelicans dive and use their pouches to catch fish ([https://www.youtube.com/watch?v=QNNI\\_uWmQXE](https://www.youtube.com/watch?v=QNNI_uWmQXE))
- "How Do Pelicans Fly?" - Educational video explaining pelican flight adaptations and group flying behaviors (<https://www.youtube.com/watch?v=7LcUOEP7Brc>)