

Birds of Prey Lesson Plan

Goal: Have the students develop awareness, appreciation, and concern for local avian wildlife.

Objectives:

1. Identify adaptations that make birds of prey unique
2. Identify their role in the ecosystem
3. Discuss human threats to birds of prey and how to minimize these threats

Materials:

1. Copies of “Test what you know about Birds of Prey” True/False quiz
2. Barred Owl wing
3. Hawk foot with talons
4. Owl skulls
5. Pellet display

A. What are birds of prey? Basic description

- 4 general characteristics:
 - a. Meat-eaters (carnivore)
 - b. Hooked beaks
 - c. Strong feet with nails (talons)
 - d. Exceptional vision
- Ask students for examples of birds of prey
 - a. Owls, hawks, eagles, osprey

B. True/False Quiz and discussion of Adaptations

- a. Directions for T/F quiz: Read first statement aloud (or ask student to read). Instruct students to stand up if they think the statement is true or stay seated if they think the statement is false. After students have “voted,” tell everyone to sit and begin discussion of answer. Discuss answer after each statement.
- b. Eyesight
 - i. Have better eyesight than humans, but do not have color vision, with the exception of bald eagles
 - ii. Can see a dime at the other end of a football field
 - iii. Owls have better night or dim light vision; however they can see fine during the day
 - iv. Hawks have better day vision
 - v. Owls with yellow eyes function better at night; brown eyes are crepuscular in hunting (hunt at dawn and dusk)
 - vi. Nictating membrane (2nd eyelid come from inside/across eye when grabbing prey; white/clear color). This membrane protects the eye from injury by prey.
 - vii. Owls eyes are fixed in skull and must move whole head to see side to side and up and down (“head bobbing”).
 - viii. The larger the owl the farther they can turn their head around. Larger owls can turn their heads about 270 degrees (have students picture a pizza and remove 2 slices). Smaller owls can turn their heads about 245 degrees (remove 3 slices of pizza).

- c. Hearing
 - i. Very good hearing
 - ii. Ear are openings covered by feathers and look like holes
 - iii. Ear openings (for birds of prey, except owls) are across from one another. Owls ears are ASYMMETRICAL (best example is barn owls). This helps them get an auditory map of where they are hunting and their prey based on the difference in time in how long it takes the sound to get to each ear.
- d. Smell
 - i. All birds of prey lack a sense of smell.
 - ii. One reason they can eat a variety of food. Example: great horned owls are one of the most common predators for skunks.
 - iii. If a baby is found, humans may put it back up in the nest (contrary to popular belief). This is true for all birds, not just birds of prey.
 - iv. Beaks do have nose holes (falcons have the biggest nose holes to allow enough air in to keep them from passing out when diving at high speeds).
- e. Beak
 - i. Hooked and used for ripping meat
 - ii. Falcons are the only birds to have a notch to the sides of the upper beak (purpose is to snap the spinal cord of its prey)
- f. Feathers
 - i. Vary in size and color for camouflage for their specific habitat
 - ii. Owls have a leading edge of their feathers that is serrated. Air passes quietly through these serrations so owls can sneak up on prey
 - iii. Hawks have a smooth leading edge. This is for greater power strokes while flying. Noisy flyers.
 - iv. Owls have feathers down to their talons (keeps prey and parasites from harming the bird), hawks have scales (evolved from reptiles)
 - v. Males and females colored the same
 - vi. When it is cold outside, the feathers are puffed out and warm air is trapped underneath the feathers (insulation)
- g. Bones
 - i. Strong skeleton
 - ii. Most bones are hollow or partially hollow
 - iii. Having a strong, but lightweight frame allows the birds to be light enough to get off the ground and stay in flight, but strong enough to support their large flight muscles and protect inner organs.
- h. Feet/Talons
 - i. Talons are very sharp; need to wear thick gloves for protection
 - ii. Bone crushing strength
 - iii. Talons made of keratin (same material in human hair and fingernails)
- i. Pellets
 - i. Birds of prey can swallow small prey items whole; bigger items are picked/torn apart using the beak
 - ii. Pellets are indigestible material from prey items (bones, fur, feathers, nails)
 - iii. Pellets are regurgitated every 8-10 hours (before a meal)

- iv. Bones are packed inside the pellet, surrounded by fur, so that the throat is not injured when passing the pellet
- v. Some bones are digested for calcium
- vi. Pellets can be examined to determine diet

C. Threats to birds of prey

a. Road kill

- i. All birds of prey will go after road kill, especially if another animal is not already on the road kill.
- ii. Birds of prey do not have peripheral vision (ability to see to either side of head without turning head), so they do not see cars approaching when focused on road kill. Can hear cars coming, but may not correctly judge how fast they are approaching. Many birds are clipped by the windshield as they try to start flying away.
- iii. Older groups - Development pressure on habitat. Discuss urban sprawl and the benefit of smart growth.

b. Imprinting

- i. Young birds of prey need to be with their parents to learn various hunting techniques. They learn by observing their parents. If a bird of prey is taken by a human before it learns these skills, it will not be able to survive well on its own in the wild.
- ii. See information sheet: "What to do if you find an injured bird."

D. Pellet dissection

a. Materials

- i. Pellets (one for every 2 students)
- ii. Plates
- iii. Toothpicks
- iv. Magnifying glasses
- v. Bone identification charts

b. Review what pellets are (info above)

c. Help students identify bones using the identification chart

d. Discussion questions

- i. Why do scientists study pellets?
- ii. Why don't pellets have bones sticking out?
- iii. Are there bones from more than one animal?
- iv. Where do you think your owl was hunting?
- v. What role does the owl play in the food web?
- vi. Assuming two pellets are produced every day, how many animals does the owl eat in one year?