Dickinson County Nature Center
Grade 4 — "Whooo's Adapted and How?"

Core expectations

4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Activity Time

One 60-minute session

Contact:

Environmental Education Team

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Program Alignment with Iowa Core Curriculum

Disciplinary Core Ideas

- LS1.A: Structure and Function: Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.

Investigative questions

- What parts do living things have that allow them to survive in their habitat?
- Can three students give me an example of an animal and one adaptation this animal has to survive in its environment?
- What body parts do birds of prey have that help them survive in their environment?
- Can the class name three or four different birds of prey?

Investigative phenomena

Students will be able to explore the adaptation of native owls through the use of mounts, skulls, pictures, and the dissection of owl pellets.

Practices (SEPs)

- Students will make observations and answer the question "What does an owl eat?" by dissecting an owl pellet.
- Students will conduct an investigation to produce evidence of what an owl eats.
- Students will construct an explanation of what owls eat and present to the class.

Cross Cutting Concepts students will identify

- Students will be able to identify patterns in nature by talking about the similarities of birds of prey.
- Students will be able identify the structure and function of the owls internal and external anatomy.
- Students will be able to use models to reconstruct the skeleton of the owl's prey.

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Grade 4 — "Whoo's Adapted and How?" Side 2

Supplies

All supplies brought by the nature center unless otherwise arranged.

- Diagram of a barn owl's internal structure
- Owl pellets
- Tweezers
- Rulers
- Bone ID guides
- Baking Sheets for dissection
- Paper towels
- Mounted barn owl
- Owl skull

Program Overview

Background

Looking at an owl pellet, many people often wonder: How they are formed? What is their purpose? What is it exactly? Are owls the only animal with this adaptation? The creation of an owl pellet and the process of owl digestion is a unique process for owls and nearly 300 other species of birds that include hawks, eagles, and even robins.

An owl pellet contains the indigestible remains — bones, fur, feathers — of an owl's meal. Owls are very opportunistic eaters that typically hunt at night for their prey. During their hunts they use their amazing vision and keen sense of hearing as they fly, silently waiting to ambush their prey. Owls consume a large variety of prey including shrews, owls, mice, moles, small birds, lizards, grasshoppers, and crickets.

Once an owl has caught its prey, it uses its sharp beaks to tear chunks off and begins to swallow its prey whole! After being swallowed, the prey begins its journey down the esophagus to the proventriculus, where enzymes, acids and fluids aid in the first steps of digestion. After being broken down in the proventriculus, the prey than travels to the ventriculus, otherwise known as the gizzard. In the gizzard, the process is briefly stopped as the gizzard helps to sort the digestible meat and indigestible —bones, feathers, scales, fur — parts. The digestible food will then continue to travel through the intestines to the vent. The indigestible food remains in the gizzard for several hours, being compressed, before traveling back to the proventriculus and being regurgitated by the owl. Before an owl consumes another meal, it must regurgitate the indigestible parts of its previous meal.

Procedure

1. The naturalist will begin the conversation about the internal and external structures that animals use to survive. Students will be asked what structures animals have to survive. Students will than be asked to name specific animals and specific physical adaptations these animals have that allow them to survive and thrive.
2. The naturalist will then introduce the term "birds of prey" and discuss what adaptations and physical characteristics these birds have that allow them to survive.
3. After the naturalist has introduced the concept of birds of prey and their adaptions, she will introduce the specific bird being studied, the barn owl.
4. The naturalist will then discuss the many unique features of an owl, such as they are nocturnal, they have awesome vision and great hearing as well as sharp talons and beaks.
5. After a discussion about the external structures that help owls survives, the naturalist will talk about one internal feature that helps an owl survive.
6. The naturalist will hang up a poster of an owl and discuss the unique way owls digest and discard their food.
7. During this talk students will be able to visually see how the food travels through the digestive system of an owl and where pellets are formed
8. After this discussion, have students divide into groups of two or three. Review safe protocol for this lab — not eating or drinking during lab; wash hands when finished. Then give each team a pellet and a bone identification guide.
9. Have the groups separate the bones from the fur and feathers on a paper towel. If possible have students separate skulls and bones into like piles. From the bone identification guide, have the students compare and contrast to see if they can come to the conclusion of what their owl ate.
10. Have students share their findings with the class to compare how the owls' diets may be the same.
11. After the lesson, instruct all students to wash their hands after disposing of the pellets.

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