

Activity Framework

Purpose

Learn what owls eat and their unique digestion process by dissecting pellets that contain undigested prey pieces.

Activity Outline

- Fact or Fiction (optional) _____ (5 min)
- Introduction _____ (10 min)
- Materials and Instructions _____ (10 min)
- Dissection _____ (1 hour)
- Cleanup _____ (10 min)

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Quick Tips

1. This evening activity is highly independent for students. The main role of chaperones is to monitor for safe use of tools and asking prompting questions, examples of which can be found later in this activity guide.
2. To reduce cost, you can have multiple students share a pellet for dissection.
3. The pellets are completely sterilized using an autoclave so students can also use their hands to dissect the pellets. Because they are fully sterile, we do not have gloves to provide for dissection.
4. To avoid distractions, do not hand out the pellets and dissection tools to students until you have given all directions.

Materials

In Kits (4):

- Tweezers (25)
- Probes (25)
- Owl Pellets (25)
- Pencils (25)
- Glue bottles (12) in small tub
- Bone charts (10)
- Skull keys (10)
- Owl wing (in box)
- Owl talon
- Hawk and owl pellet samples
- Rodent skeleton display
- Owl calls CD
- 3x5 index cards
- Data sheets in folder

Not found in kits:

- Replacement owl pellets (found in blue buckets)
- Replacement index cards and data sheets (found in restock tub)
- CD player (found in kit room)

Fact or Fiction (optional)

Time: ~10 minutes

Read aloud the following “Fact or Fiction” statements that relate to owls and have students answer *Fact* or *Fiction* as a group. They can answer by a show of hands or by holding up one finger for *Fact* and two fingers for *Fiction*.

- The Screech Owl’s call sounds like a loud “screech.”
 - ◇ **Fiction:** Despite its name, the Screech Owl’s call does not sound like a “screech.” Its primary call sounds like a horse’s mournful whinny.
- Owls can turn their heads all the way around.
 - ◇ **Fiction:** All owls have eyes that are fixed in their sockets, so they must be able to turn their heads to see in different directions. However, they can only turn their heads about 270 degrees, or $\frac{3}{4}$ of a circle.
- Owls can’t smell.
 - ◇ **Fact.** Owls, like most other birds, do not have well developed sense of smell. That comes in handy for Great-horned Owls when they hunt skunks!
- All owls hunt at night.
 - ◇ **Fiction.** Northern Hawk Owls and Great Gray Owls hunt primarily during the day.
- If owls were the size of humans, their eyes would be the size of golf balls.
 - ◇ **Fiction.** Owl eyes would be the size of grapefruits.
- Owls have about 2,000 feathers.
 - ◇ **Fiction.** Owls have about 7,000 feathers.
- Owls have 3 eyelids.
 - ◇ **Fact.** Owls have a nictitating membrane that covers their eyes to protect them from branches and twigs when they dive down for their prey.
- Owls don’t have very good hearing.
 - ◇ **Fiction.** Owls have the best hearing in the bird world. They have one ear higher than the other to allow them to pin point the source of the noises around them.
- Like myths and legends imply – owls are very wise.
 - ◇ **Fiction.** While owls are not “dumb,” they are not very wise. Be-

cause of how much space their eyes take up in their skull, there is not much room for a brain.

- Owls have 2 stomachs.
 - ◇ **Fact:** When owls eat, their food goes to a primary stomach (also called the proventriculus) first that dissolves and breaks up the prey, then the food moves up to the muscular stomach (also called the gizzard). The gizzard catches claws, bones, teeth, fur, and feathers; the animal parts that owls cannot digest. The gizzard will also grind up the meat of the prey and pass it on to the small intestine. The gizzard will then press the hair, fur, and feathers around the bones to form a pellet.

Introduction

Time: ~10 minutes

Explain to students that owls are birds of prey, better known as raptors. *What adaptations allow raptors to successfully hunt? What allows them to be successful nocturnal hunters?*

- Owls are a type of carnivorous bird called raptors.
- Other raptors include hawks, eagles, falcons, and ospreys.
- Most raptors hunt small mammals, birds, amphibians, reptiles, and larger invertebrates.
- All raptors possess similar adaptations that allow them to hunt: they are strong and agile fliers, they have keen eyesight to locate prey, strong legs and talons for capturing prey, and hooked bills to tear flesh.
- **Although owls share these characteristics, they have adapted to their nocturnal lifestyle. Other species of raptors are active primarily during the day so they have not evolved these specialized adaptations to be active at night.**
 - ◇ Eyesight: much larger eyes that contain a lot of rods (light sensing cells) than other raptors allow for more light to enter, making it easier to see at night.
 - ◇ Hearing: an asymmetrical skull shape allows them to pinpoint where sounds are coming from.
 - ◇ Silent flight: a large wing surface area allows them to fly at prey with minimal wing beats. When they do flap, they have comb-like serrations at the ends of their wing feathers to break up air flow and muffle sound. *You can show students these serrations on the owl wing in the kit.*

Turn and Talk: what can the contents of owl pellets tell us about owls? What can they tell us about the area they are living in?

Facilitation Note

If the students have already attended a raptor program, you can gloss over “what makes a raptor a raptor” unless you feel the students need a quick review. The most important piece of content is their nocturnal adaptations which are bolded to the left.

Materials and Instructions

Time: ~10 minutes

Students should already have index cards, data collection sheets, pencils and glue in front of them. Before handing out pellets and the dissection tools (probes and tweezers), establish the following rules and guidelines:

- If students are sharing a pellet with another student, establish that they should take turns with dissection and recording.
- *You will receive some tools for dissection. The pellets are also fully sterilized so you can use your hands for dissection as well. When using the tools, please handle them with care.*
- *The index cards and glue are for putting those skeletons together. There are probably more than one animal in each pellet so each person can work on putting their own skeleton together. You can reference the skeleton in the kit to see how one way to put the skeleton together on your card. Please write your name on your index card.*
- *Completed skeletons can be taken home or thrown away.*
- *Bone charts and skull keys are for identifying the animal skeletons inside your owl pellet. The data sheets are for recording data about each student's pellet and class-wide data as well.*

Optional Activity

While students dissect, you can play the Owl Call CD on the provided CD player.

Optional Activity

Have students come up with a short story about the animal they found in the pellet and the owl that ate it. They can focus on the animal's life, habits, habitat, death, and its importance to the ecosystem it lived in.

Dissection

Time: ~1 hour

As students dissect their pellets, sort the bones they find, and glue them to their index cards, roam the room and react to what they find alongside them. You can also ask some questions to glean what they think about their finds. Some example questions include:

- Is anything in your pellet unusual or unidentifiable?
- Why do you think owls need to regurgitate the materials in their pellets?
- What could happen to an owl if it tries to digest one of these bones?
- What can the contents of your pellet tell us about the owl's life? What about the prey animal's life?

When students have found all the skulls in their pellets, at the bottom of their data sheets, they can tally the class total for and percentage of the kinds of animals found.

- What do these percentages tell us about where these owls live?
- Why do you think there is more of one kind of animal than others?

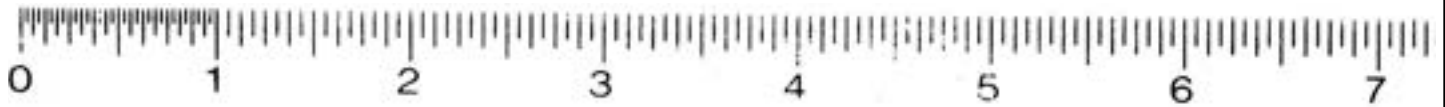
Cleanup

- Throw hair and any unwanted bones in the garbage.
- Collect tweezers, probes, pencils, and glue. Place them in their respective containers.
- The foil that was covering the pellets can be recycled in one of the DC lobbies.
- Place bone and skull keys in their appropriate binders.
- Students can keep their index cards with bones glued to them or throw them away.

Owl Pellet Dissection Data Sheet

Record the following data **before** dissecting your pellet:

How long is your pellet? _____ in. How wide is your pellet? _____ in.



What is the general color of your pellet? _____

While dissecting, record the following data, using the bone charts and skull guides to help:

Number of skulls:

- _____ Rat
- _____ Shrew
- _____ Mole
- _____ Bird
- _____ Other
- _____ **Total**

Number of other types of bones:

- _____ Ribs
- _____ Jaws
- _____ Pelvis
- _____ Scapula
- _____ Humerus
- _____ Vertebrae
- _____ Other

Using the skulls found in your pellet, if owls form one pellet each day, how many animals would your owl eat...

...in a week? _____ ...in a month? _____ ...in a year? _____

Record the following data from the **whole class**:

Number of skulls:

- _____ Rat
- _____ Shrew
- _____ Mole
- _____ Bird
- _____ Other
- _____ **Total**

Percentage of the owls' diet:

- _____ % Rat
- _____ % Shrew
- _____ % Mole
- _____ % Bird
- _____ % Other