



Welcome to Owls from the Inside Out!

We are excited to be working with you and your students in our new Interactive Media Education program at the Ann Arbor Hands-On Museum. This kit includes everything you need for your program:

- List of targeted MI Curriculum Framework Benchmarks
- Background information on owls
- Materials
- Safety information
- Directions for set up
- Tips for helping us to facilitate the program during the event

After you have read the Teacher's Guide, we would be happy to answer any questions you still have. Thank you for your participation, and we look forward to working with you!

Michigan Curriculum Framework Benchmarks addressed in Owls from the Inside Out

- SCI.I.1.E.1 Generate reasonable questions about the world based on observation
- SCI.III.2.E.1 Explain characteristics and functions of observable body parts in a variety of animals
- SCI.III.2.E.4 Compare and contrast food, energy, and environmental needs of selected organisms
- SCI.III.4.E.2 Explain how physical and/or behavioral characteristics of organisms help them to survive in their environments
- SCI.III.5.E.1 Identify familiar organisms as part of a food chain or food web and describe their feeding relationships within the web.

Background information

This videoconferencing program is appropriate for Grades 3-6 and focuses on owls, their physical characteristics and feeding behavior, and how their characteristics and behaviors have adapted them for their way of life. Owls will also be used to illustrate a food chain and the role that avian predators have in an ecosystem. The owl pellet dissection activity will allow students to determine the diet of a barn owl and introduce students to skeletal anatomy and prey identification. You may wish to share the vocabulary and/or background information with your students to help them prepare for the program.

Vocabulary:

<i>Bird of prey</i>	Any member of a group of birds that kill and eat other animals for their food. They are characterized by a sharp, hooked beak and strong, sharp talons, as in hawks and owls (also called raptors.)
<i>Carnivore</i>	An animal that eats meat
<i>Nocturnal</i>	Active at night rather than during the day
<i>Predator</i>	An animal that hunts, kills and eats other animals
<i>Prey</i>	An animal that is killed and eaten by another animal
<i>Talons</i>	The claws on the toes of a bird of prey

Additional Information:

Owls are nocturnal hunters and are very well adapted for this way of life.

Talons are composed of hard keratin surrounding a living, growing core and are designed for catching and killing prey. They are powered by a tendon that runs from the foot along the back of the leg to where it attaches to a muscle above the ankle. The firm grip of the tendons means an owl doesn't need to rely on muscular strength to carry off its prey.

Flight Feathers have an unusual structure that allows owls to fly silently. Most birds' primary wing feathers are smooth-edged. In an owl's flight feathers, the leading edge is comb-like, minimizing noise by disturbing the flow of air around the wings. An owl's flight feathers also have a velvety surface and fringes on the back edges that also help to muffle noise.

Like other raptors, owls have **hooked beaks** that are used for tearing food. An owl's beak consists of keratinized skin covering bone. Owls often consume smaller prey whole, but larger prey is ripped apart with the beak. When an owl swallows its prey whole, there is a large amount of indigestible material such as fur, bones, and feathers. Small bones are digested and the owl uses the calcium, the rest is regurgitated as a pellet.

The placement of an owl's **ears** is asymmetrical allowing depth perception in hearing. Looking at an owl's skull you can see this asymmetrical placement. Facial disks further aid in hearing because of their parabolic dish shape that funnels sound waves to the ears.

An owl's **eyes** are proportionally large compared to head size. Owls have a keen sense of site because of the large number of light receptor cells (rods) in their retinas, allowing for excellent night vision. Owls have very few cone cells that distinguish color. Eyes that are positioned in front, not on the side like most birds, provide owls with binocular vision and depth perception. Their eyes are fixed in their sockets and they cannot move them around like our eyes can. Instead owls have extremely flexible necks and can turn their heads 270 degrees.

When owls hunt for food, they do not waste time chewing it, so owls usually swallow their prey whole. The fur and bones of the prey cannot be digested and are regurgitated about 12 hours after the meal in the form of an **owl pellet**. These pellets are uniformly dark gray and measure from one and one half to three inches long and three quarters to one inch in diameter. They typically include bones, fur and feathers. These pellets can be taken apart and examined

to find out what types of animals the owl eats. Owl pellets can be found on the floors of abandoned buildings, beneath a grove of tall trees, or under other structures that offer shelter from inclement weather. Other species of birds also cast pellets, including eagles and hawks as well as smaller birds like robins and sparrows.

Materials (for a class of 30)

Provided in Kit:

- 15 owl pellets – students will work in pairs
- 15 plastic forceps
- 15 wooden probes
- 15 Paper plates
- Skeleton diagram sheets
- Bone sorting charts

Provided by classroom:

- *Optional* – hand lenses or magnifying glasses

Safety Information

All the owl pellets in this kit have been heat-treated to sterilize them, but we recommend these precautions:

- **If a student is allergic to animals or animal fur, it would be best to get permission from the parent/parents.**
- **As with every science project, have students wash their hands with soap and water after the program.**
- **Clean up the work area with a commercial cleaning solution or create your own using a bleach and water mixture.**

Set Up Instructions

BEFORE the scheduled lab time:

- Divide the students into lab partners and distribute materials into dissection kits.

Each pair of students should have:

- 1 owl pellet
- 1 plastic forcep
- 1 wooden probe
- Paper plate
- Skeleton diagram sheet
- Bone sorting chart

Program Facilitation Tips

During the Owls from the Inside Out videoconference, AAHOM educators will direct students through the experiments and discussion. Our owl expert from the **Howell Nature Center** will answer questions and present live owls and owl specimens, such as bones and feathers, that will give students more insight about the physical characteristics of these amazing birds.

- I. Welcome
- II. Introduction to how owls are adapted to their way of life
- III. Owl pellet dissection
- IV. Discussion
- V. Questions and conclusions

Review the **Videoconferencing Facilitation Tips** *before* your program. Remember, teachers **are required to remain in the classroom** during the presentation. If you have teacher's aides or parent helpers, ask them to join as well – the more hands the better ☺! While the AAHOM educators are leading the program, please help us by:

- Familiarizing yourself with the kit materials and preparing your classroom ahead of time using the *Set Up Instructions* provided in the Teacher's Guide
- Distributing and/or supervising materials
- Keeping students on task by encouraging them to “stop, look and listen” and follow the hands-on procedures just as the leader explains them
- Assisting students with the hands-on activities and experiments when necessary
- Facilitating interaction with the AAHOM staff (i.e. help us to identify students who wish to ask or answer a question).

We encourage you and the students to participate in the activities, ask questions, provide feedback when the leader requests it, and most of all, HAVE FUN!

Contact Information

If you have any questions or concerns regarding the content of the class, please contact

- Patricia Ferrer Beals (Interactive Media Educator) – 734.995.5439, pferrer@aahom.org

Resources

Web-sites:

Owls

<http://eduscapes.com/42explore/owls.htm>

Owl Cam

<http://www.owlcam.com>

Books and Periodicals:

Winged Silence Great Gray Owls. By Lynne Warren: National Geographic Magazine, February 2005

All About Owls by Jim Arnosky; ISBN: 0-5904-6790-5

Owls: Who are they? By Kila Jarvis; ISBN: 0-8784-2336-2

The Barn Owl by Bert Kitchen; ISBN: 0-7534-5171-9

Owls: a Wildlife Handbook by Kim Long; ISBN: 1-5556-6200-5

The Book of North American Owls by Helen Roney Sattler; ISBN: 0-3956-0524-5