

Wolf Ridge Environmental Learning Center
6282 Cranberry Rd, Finland, MN 55603 • 800-523-2733 (MN, WI) • 218-353-7414



OWL PELLETS

Evening Activity



Dissecting a sterilized owl pellet.

OWL PELLETS

WOLF RIDGE CLASSES:

Animals:

Animal Signs
Beavers
Birds
Small Mammals
Snowshoe Hare
White-tailed Deer
Wildlife Management

Plants:

Forest Ecology
Plant Study
Trees and Keys
Wetlands Ecology

Aquatics:

Lake Study
Stream Study
Fisheries Management
Frozen Lake Study

Earth Science:

Acid Rain
Geology
Weather

Human Culture and History:

Living Lightly
Nature's Timing
Ojibwa Heritage
Ojibwa Snowshoe
Seeds of Change
Voyageur Life

Personal Growth:

Adventure Ropes Course
Rock Climbing

Group Building:

Basic Survival
F.I.R.S.T. Games

Outdoor Recreation:

Beginning Orienteering
Competitive Orienteering
Canoeing
Cross Country Skiing
Superior Snowshoe
Superior View Hike

Evening Activities:

Astronomy
Block Printing
Creative Expressions
Creature from Wolf Lake
Dream Catchers
Lake Superior Game
Night Hike
Owl Pellets
Paper Making
Star Lab
Woodland Art
Volleyball

Naturalist Presentations:

Bats
Fur Trade
History of the North Shore
Logging Camp Life
Raptors
Wolves

Class Description: An Evening Activity

Students will learn about the adaptations of barn owls and their role in the food web. By dissecting sterilized owl pellets, they find and rebuild a skeleton of a small mammal, which can be identified, glued onto a card, and taken home.

Total time: 1.5 hours

Audience: 4-20 students, 4th grade through adult

Activity level: easy

Travel: none

Total uphill travel: none



About Wolf Ridge

Wolf Ridge is an accredited residential environmental education school for persons of all ages. We offers immersion programs which involve direct observation and participation in outdoor experiences. Wolf Ridge programs focus on environmental sciences, human culture and history, personal growth, team building and outdoor recreation.

Our Mission

To develop a citizenry that has the knowledge, skills, motivation and commitment to act together for a quality environment.

What We Do

We meet our mission by:

- Fostering awareness, curiosity and sensitivity to the natural world.
- Providing lifelong learning experiences in nature.
- Developing social understanding, respect and cooperation.
- Modeling values, behaviors and technologies, which lead to a sustainable lifestyle.
- Promoting the concepts of conservation and stewardship.



Wolf Ridge Campus

Photo by Jim Brandenburg



Wolf Ridge

Environmental Learning Center

6282 Cranberry Road

Finland, MN 55603-9700

800-523-2733 (MN,WI)

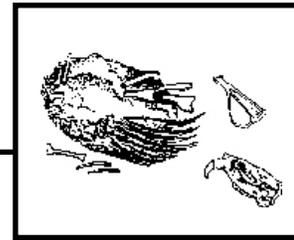
218-353-7414

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Wolf Ridge is an equal opportunity educator and employer.

OWL PELLETS



OUTLINE:

I. Set-up (10 min.)

II. Introduction (5 min.)

- Greeting
- Learn Names
- Behavior Guidelines
- Class Overview
- Assess Learner Level

III. Barn Owls (5 min.)

IV. Owl Pellets (1 hr, 15 min.)

- Step 1: Dissecting a Pellet
- Step 2: Building a Skeleton
- Step 2: Story Writing

V. Conclusion (5 min.)

VI. Video Option (20 min.)

VII. Clean-up (10 min.)

VIII. Appendices

- Equipment
- Resources
- Risk Management
- Glossary
- Appendices
 - Owl Pellet Mystery Workbook



CONCEPTS:

1. A food web is more stable than a food chain.
2. There is life found in every possible niche (habitat and role) on earth.
3. Predator/prey relationships are an example of coexistence in a balanced ecosystem.
4. All living things acquire physical and behavioral adaptations to be successful in their environment.



OUTCOMES:

Upon completion of the Owl Pellets Evening Activity students will be able to:

1. Identify the role and adaptations of owls in the ecosystem.
2. Clarify the concept of a food web.
3. Dissect an owl pellet.
4. Identify small mammal skulls and bones using a bone identification chart.



MN GRADUATION STANDARDS:

Wolf Ridge has aligned the Center's entire curriculum to Minnesota Department of Education Academic Standards. The Center maintains a curriculum standards matrix for the following subject areas:

- Science
- Mathematics
- History and Social Studies
- Arts
- Language Arts

The Matrices are organized by grade level and subject area, listing Strand, Sub-Strand, Standards, and Benchmarks. Every class addressing a benchmark is also noted. As the primary student audience at Wolf Ridge is from 4th-12th grade, the matrices address these grade levels. Teachers may request that their students focus upon a specific benchmark while attending Wolf Ridge.

Copies of our matrices are available on the Wolf Ridge web site at www.wolf-ridge.org, found under the "Education" menu. If you cannot access the matrices via the website, request a printed copy by calling 218-353-7414 or e-mailing us at "mail@wolf-ridge.org".

Revised February 2009

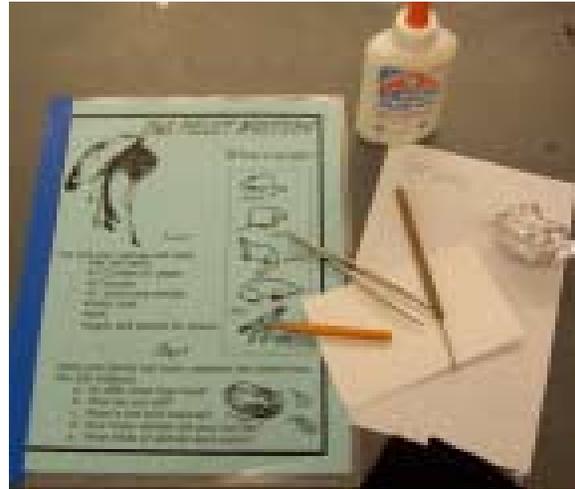
Each group of two will need:

- Owl Pellet
- Mystery Workbook
- an owl pellet
- 1/2 sheet of paper
- 2 forceps
- 2 dissecting needles
- index card
- glue
- paper and pencils for stories

I. Set-up (10 min.)

Arrange tables so that pairs of students can work together on one pellet. At each station, lay out the station materials (see sidebar). In the front of the classroom, display the 3-4 posters. Hang the owl wing on the wall. Sample skeletons should be set out on each table. If using the video, roll in the tv/vcr and get the video ready to go.

Read through the background information on pellets, to help answer questions the students may have.



II. Introduction (10 min)

Greeting/Grabber

As students enter, have them seat themselves in pairs at a station.

Learn Students' Names

Take a few minutes to learn the names of your students and welcome them individually to the class. Repeat their names and strive to use them in every communication.

Set Behavior Guidelines

Discuss clearly and specifically which behaviors you expect from your students during the next 1.5 hours. Explain the need for respect; for you, for each other, for the equipment.

Overview of the Class and Concepts

Students will sit tight for the first 10 minutes while the role and adaptations of barn owls are discussed. After a brief demonstration, students will be given an hour to dissect their pellets and reconstruct skeletons. Finally they will consider the interaction of owls and their prey, and write a short story about it.

Assess Learner Level

During the introduction find out what the students already know about owls and their habits. Ask questions to determine what students know about food webs and why and how owls form pellets.

III. Barn Owls (5 min)

Owls, like other birds of prey, catch and eat other animals for their food. Unlike the others, however, many are nocturnal, or active at night, and stay here all winter long (they have feathered feet to stay warm).

Since owls hunt at night, their eyes contain only rod cells, which gather more light than cone cells, but cannot distinguish colors. So owls see only in black and white, but they could read a newspaper a mile away by the light of a candle (if they could only read). Owl eyes take up so much room in their heads that there is no room for muscles, so owls cannot move their eyes to look around. That is why they turn their whole heads, and can see all the way behind themselves. They cannot, however, turn their heads in a complete circle (only about 3/4 of the way.)

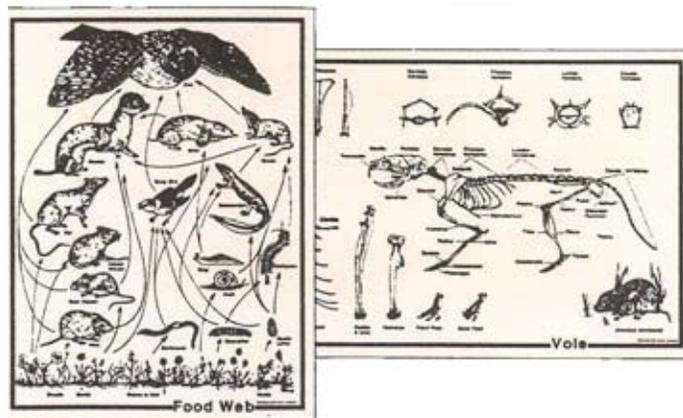
An owl's ears are so sensitive that they can hunt in complete darkness where even they cannot see. The feathered facial disk gathers sound waves, and uneven ears hear sounds at slightly different times, which helps the owl determine exact distance and direction of sound. Silent wings, with soft feathered edges to glide noiselessly through the air, allow them to sneak up on prey as well as hear while they are flying.

Owls hunt mostly small mammals, birds and invertebrates like insects and worms, which they usually swallow whole. Bones are not digestible, and would puncture the soft, curved intestines of the owl if passed through the digestive tract. So the bones, along with fur or feathers, are formed into a ball or pellet by the gizzard muscles and passed back up the tough, straight esophagus to be cast out twelve hours later. Pellets (or "castings" to falconers) may include bones, teeth, hair, feathers, scales or insect skeletons. They also provide homes for clothes moths, carpet beetles and fungi. You may even find droppings, cocoons or exoskeletons from these animals.



These pellets are collected in the wild from Barn Owls (*Tyto alba*), which do not live in northern Minnesota. (They are most likely from northwestern Washington state.) Barn owls feed in open fields and often roost in barns, steeples or caves where pellets can be easily collected. These pellets are then dried and heat sterilized, and shipped to Wolf Ridge for you.

Assessment
(Outcome 1 & 2)



CONCEPT:
All living things acquire physical and behavioral adaptations to be successful in their environment.

CONCEPT:
There is life found in every possible niche (habitat and role) on earth.

CONCEPT:
A food web is more stable than a food chain.

CONCEPT:
Predator/prey relationships are an example of coexistence in a balanced ecosystem.

TEACHER NOTE:
Use the barn owl posters, wing and pellets as props during your introduction.



IV. Owl Pellets (1 hr, 15 min.)

Step 1: Dissecting a Pellet

Direct students to work together in pairs to discover what is hidden in their pellets. Using fingers, forceps and the dissecting needles, carefully separate the bones from the soft material in your pellet. Sort the bones into piles according to type, and put all the hair fluff in another pile on a piece of paper.

As students dissect their pellet, help them answer the following questions:

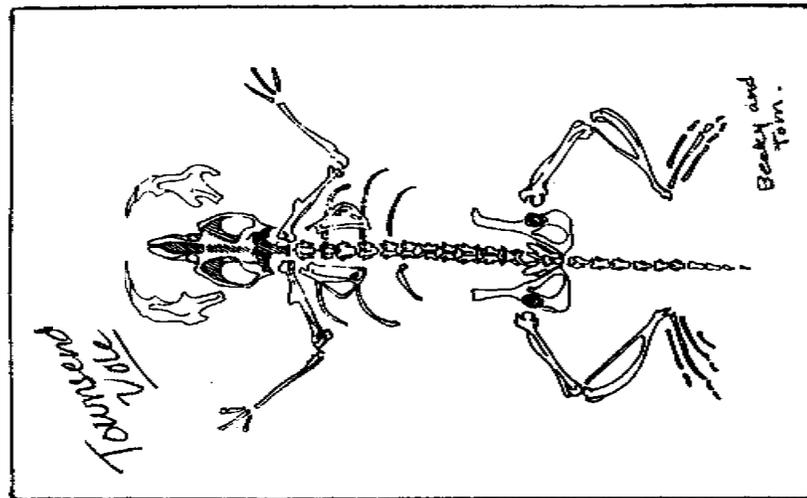
- Do owls chew their food?
- How can you tell?
- What is the soft material?
- How many animals did your owl eat?
- What kinds of animals were eaten?

Assessment (Outcome 3)

Step 2: Reconstructing a Skeleton

Have students choose one of the skulls from their pellet. They should reconstruct a skeleton of that animal, using the skeleton/bone sorting chart in the Mystery Booklet to help them find the correct bones and locations. They should glue the bones in place on an index card. Have students write their names and the kind of animal on the card. Students can draw in any missing bones with their pencils.

Assessment (Outcome 4)



Step 3: Story Writing

Students should use the food web poster to help them determine the predator/prey relationship of the owl and their animal. Each pair of students should write a story about their animal's life and death, and the importance of both of them to the ecosystem.

Assessment (Outcome 2)

Fred the dead and the unlucky mole, Claw, went for a walk in the woods one day. They heard some squawking but didn't think anything of it. It was already sundown when we got lost. We were getting worried about the squawking because it started to get louder. All of a sudden we heard a swooping sound and Fred ducked but the owl, yes owl, got him. I started to run, but I couldn't get away. He got me, but I was surprised to be swallowed whole. A couple hours later we were dead, but I was told in Animal Heaven that after we were swallowed, we were regurgitated, or puked out in an owl pellet. Someone was walking through the forest and picked us up. Now we were glued to a piece of paper and not put together right. Oh, well! No one's perfect.

Lori and Kristi's project.

V. Conclusion (5 min.)

Offer students a chance to read their stories if they want. Discuss what was learned today about the adaptations and roles of owls and their prey.

Assessment (Outcome 1 & 2)

At the end of the conclusion, students should help the instructor clean up and put the equipment away.

VI. Option

While students are dissecting their owl pellets, you may choose to show the video on Barn Owls, which located in the kit. It is 20 minutes long.

VII. Clean-up (10 min.)

Each student should carry left over bones and hair to the wastebasket. Tools must be cleaned and placed in their containers. Replace all items neatly in bin. Return to kit room along with posters and TV.

Wash hands and table tops with soap and water after class. Stack tables and chairs and close windows.

VIII. Appendices

• Equipment

owl pellets
1/2 sheets of paper and index cards
forceps and dissecting needles
glue
paper and pencils for story
Sample Skeleton
Owl Pellet posters
Barn Owl wing
"Ridge" notes for instructors

• Resources

- Pellets, Inc. PO Box 5484, Bellingham, WA 98227-5484, 206-733-3012. (Barn owl pellets, kits, posters)
- Acorn Naturalists, 17300 East 17th St, #J-236, Tustin, CA 92680, 1-800-452-2802 (Barnowl pellets, kits, posters, books, etc.)
- References
 1. Owl Pellet Kit, Pellets, Inc.
 2. Audubon Society Encyclopedia of North American Birds, @ 1980, ISBN 0-394-46651-9.

• Safety Management

Instructor will adhere to all safety practices designated by this lesson plan or updated by Wolf Ridge staff. Instructor will carefully monitor students for safe and responsible use of forceps and tweezers. A first aid kit and telephone are available in the kit room. Any safety or risk concerns should be brought to the attention of the Wolf Ridge permanent staff. Unsterilized owl pellets may carry the risk of salmonella; our pellets **are** heat sterilized. It is suggested, however, that all participants wash their hands and table tops with soap and water at completion of class.

• Glossary

Bird of prey: A bird which catches other living animals to eat.
Cone cells: Light receptor cells in the eye which detect color, but are not very sensitive to low light.
Esophagus: The thick, straight, muscular tube down which food passes from the mouth to the stomach.
Gizzard (Stomach): The muscular first part of a bird's stomach, which often contains gravel to help digest food.
Nocturnal: Active at night.

Pellet: A compact ball of indigestible material, formed in and cast up from the stomach of a bird, which contains bones, teeth, claws, exoskeletons, etc from animals which the bird ate.

Proventriculus (Prestomach): Glandular second part of a bird's stomach, containing gastric enzymes that break down proteins such as meat.

Rod cell: Light receptor cells in the eye which are extremely sensitive to low light, but which do not detect colors.