

Exploring the Food Chain through Owl Pellet Dissection

Section 1

Situation: Hamilton County is a rural community with a single public elementary school which serves approximately 600 youth. The Title 1 school serves youth from limited income households with a demographic breakdown of 56% white, 30% black, 12% Hispanic and 2% other. School enrichment programs provide me the opportunity to serve youth of all races, ethnic groups, and genders. Many families do not have adequate transportation or funds to travel to our office for programs. Delivering 4-H programs at the school provides youth the opportunity to experience 4-H equally. This program was developed in 2022 and continues to be popular with teachers, youth, and parents. The lab has been delivered yearly to 5th grade youth since 2022, delivered at a nature camp at a local state park, and for a community club.

Owl pellet dissection labs provide youth the opportunity to practice observation skills, work in pairs to accomplish a common goal, complete a lab report, and present their findings orally. Although the program focus is the owls' role in the food chain and the environment, workforce preparation skills are woven into the program. This aligns with the needs of the community as indicated by the advisory board and a needs assessment. I introduce career options and engage youth in brainstorming career choices that include teaching, studying ecosystems, protecting species and habitats, ornithology, and communicating about nature.

Objectives and Educational Standards:

- 1) Provide an interactive learning experience to teach predator/prey relationships, the food chain cycle, and the importance of indicator species.
- 2) Give 5th grade students the opportunity to use microscopes for a dissection lab.
- 3) Introduce the importance of the following workforce skills: observation, data collection, teamwork, and written reports.
- 4) Introduce 4-H in the classroom to encourage youth participation in day camps and clubs.

The following educational standards for 5th grade science are from CPalms, the Florida Department of Education's online toolbox. These are some of the standards that we cover.

- 5) Energy flows from the sun through producers to consumers.
- 6) Animals interact with and depend upon each other and their environment to satisfy their basic needs, like food and shelter.
- 7) When the environment changes, differences between individuals allow some plants and animals to survive and reproduce while others die or move to new locations.
Example: owls enlarge their hunting territory, and their diet may change in response to an environmental change that limits their prey selection.

Program timeline:

September	Meet with lead teacher to review 5 th grade science standards and provide an overview of the owl pellet dissection program.
October	Correspond with teachers to schedule science lab dates.
November	Contact school to order owl pellets.
January	Coordinate with 4-H volunteers to assist with labs.
February	Finalize lesson plan, gather materials, prepare worksheets.
March	Provide the teachers with pre-lab materials. Deliver the program.

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Implementation: With the assistance of a 4-H volunteer, I deliver the owl pellet dissection lab to 100% of all 5th grade classrooms in 2024. Students learn about the food chain, owls as an indicator species, predator & prey relationships, and practice recording data during the dissection lab.

Methods: The program is delivered in-person in classrooms at the elementary school. Volunteer support is essential to help with the group food chain activity, assist with the dissection and identification of prey, and teach students how to use the microscopes.

The program begins with an introduction to the food chain and predator/prey relationships by a volunteer. I introduce new terms like apex predator and indicator species, and we engage the students in small group activities to identify the food chain cycle for various plant and animal species represented on laminated cards. Students discuss ecosystems and animal habitats as they connect their cards in a food chain. Owls are introduced with video clips, discussions about preferred burrows/homes, and sound bites.

Following the introduction of two owl species, the Great Horned Owl and the Barn Owl, we transition to the dissection lab. Students work in pairs to dissect their owl pellet, record their findings, and report to a volunteer or teacher the results of their observations. Accuracy is emphasized for all measurements, and detailed descriptions are required. Due to the length of time for delivery of the program, including owl pellet dissection and microscope use, we extend science class time, and teach the program over the course of a week to reach all 5th grade youth

In every class, there are youth that are reluctant to participate at first, but 99% of all youth are engaged in the dissection process by the end of the lab. Those youth that are reluctant to touch the pellet are soon eagerly sharing their “finds.” Prior to this lab, very few of our 5th grade students have ever used a microscope. I purchased six stereo microscopes and a camera adaptor to use for this program in 2022. In addition to the bones and fur from the owl pellet, we provide students with a wide range of natural items to examine. Their excitement is contagious during the microscope portion. Lab reports are submitted to the teacher. I review the program success with my volunteer and the teachers to adapt the program as needed for the next year.

Section 2

Evaluation: Teacher feedback, observational data collected throughout the labs, completed lab reports, and student feedback are reviewed to help inform adjustments to program plans.

Results: Student participation and answers, observational data, and completed lab reports reveal the following:

- 100% understood the importance of observation skills, accurate measurements, and data collection
- 99% participated in the dissection lab
- 98% of all youth utilized a microscope for the first time
- 95% of youth agree that teamwork is an important skill to develop
- 95% indicated understanding of the food chain, the flow of energy, and environmental impacts on plants and animals.

Number of student participants in 2024 = 138 (unduplicated).

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Knowledge gained, exposure to science through the dissection lab, and the excitement about the predator/prey study are a few of the positive results of this program. However, the best evidence of impact often happens outside of the school setting. Examples: On several occasions I have been approached in town (at the grocery store) by a student pulling a parent forward to introduce me as the “4-H lady that brings owl pellets to class.” It is rewarding to hear from parents at school meetings that their student told them about 4-H and the owl pellet lab. This program has increased knowledge of 4-H in the school and community. It has resulted in six new members joining 4-H clubs. Additionally, following the first year, the school began purchasing the owl pellets for me to use in the classrooms.

Collaboration:

Collaboration is important to define a program that meets the science standards for youth and engages teachers in 4-H school enrichment programs. Working with teachers allows me to identify topics of interest and areas of need for 4-H school enrichment programs. Building trust, identifying shared priorities, and designing impactful programs together ensure that our partnership continues for the benefit of our youth. Time spent reviewing and adapting the program also ensures that the program remains meaningful and essential. This year, school administrators were invited to visit and observe the lab. Their enthusiasm helped promote 4-H school enrichment activities to other grade level teachers. Because of the successful collaboration with the 5th grade lead science teacher, I received permission to present another program to 6th grade youth. The relationship established with the 5th grade science team helped open the door to provide a life skill program for middle school youth.

Section 3

Program need:

Our elementary school is a Title 1 school. Our community has few extracurricular activities for youth, and many cannot attend 4-H club meetings at our office because of transportation limitations. Providing the owl pellet dissection lab for 5th grade students has resulted in an opportunity to engage youth in 4-H who may never experience a traditional club meeting.

Continuation plan and innovation:

This program will continue in spring 2025. Students now anticipate the 4-H team each spring with our plush owls, microscopes, owl pellets, and food chain materials. I will meet with the lead science teacher again in fall 2025 to schedule our labs for 2025 - 2026. Additionally, this successful owl pellet dissection program resulted in a request from two teachers to discuss 4-H school enrichment ideas for the 2025-2026 school year. Innovation is thinking *outside the box*, combining creative ideas with genuine needs, and improving relationships to foster continued growth. This program has allowed me to meet a need for 5th grade students in the form of an interactive science lab, while growing 4-H school enrichment programs.

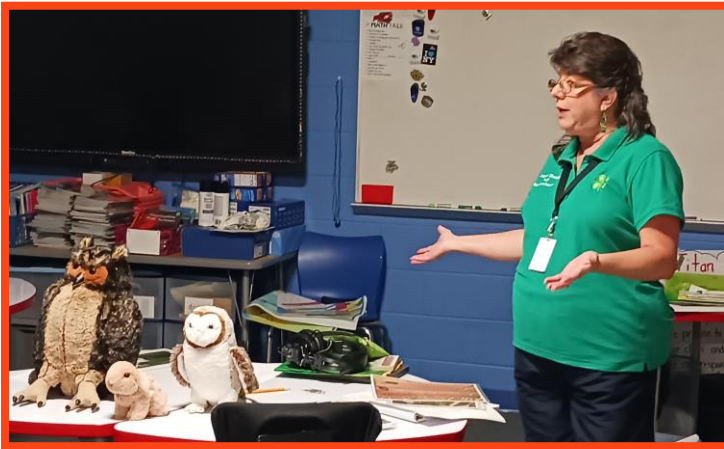
Owl Pellet Dissection

Hamilton County Elementary School



Lab materials

Using a chart to identify the bones found in the pellet.

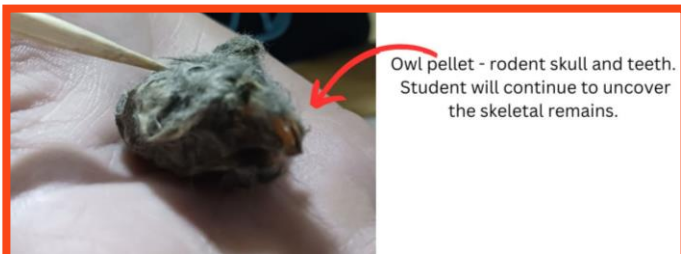
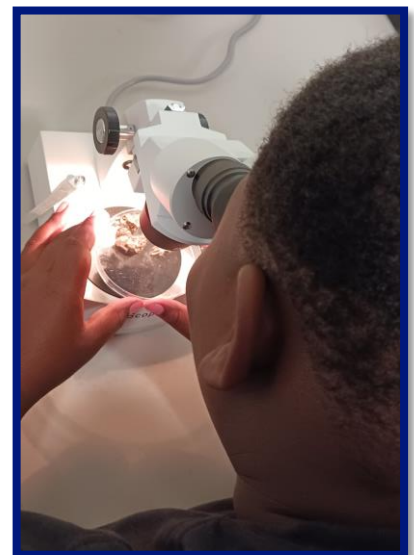


Volunteer teaches 5th grade students about the food chain.



Students work in pairs to complete the dissection and the lab report.

Students use microscopes for “up-close” observation.



Owl Pellet Lab - Observations



Students _____ and _____

Date _____ Teacher _____

- 1. Examine the materials and tools on your table.** Check the list on the board to make sure you and your partner have all the necessary items before the lab begins.

Once you have verified you have all necessary items, check this box ☐

- 2. Measure the length and width of your owl pellets in centimeters.**

Length of your owl pellet _____

Width of your owl pellet _____

Mass of your owl pellet _____

- 3. Carefully examine the exterior of the pellet.**

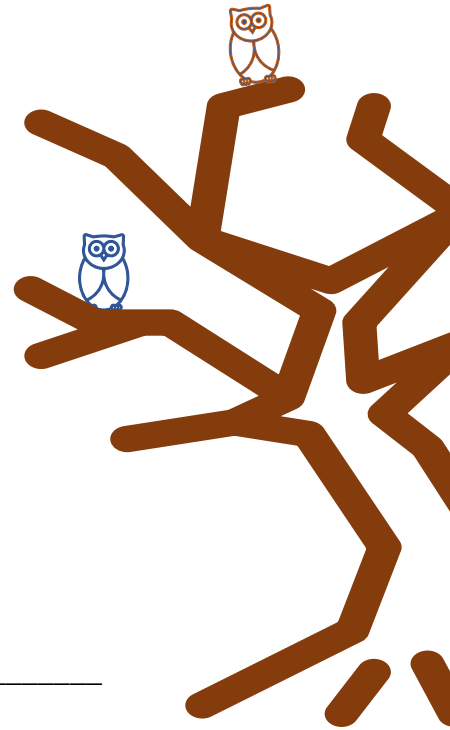
Do you see any signs of fur? _____

Do you see any signs of feathers? _____

Do you see any seeds? _____ Do you see any signs of grass? _____

What else do you observe about your owl pellet? _____

Draw a sketch of your owl pellet:



Owl Pellet Lab - Observations



Write a description of your owl pellet. Be thorough, including information from your examination. Use complete sentences.

- 4. Examination:** The 4-H agent will talk you through the lab. You will carefully use a wooden probe to break apart the owl pellet and observe what you find. Using tweezers and a probe, expose the bones for identification. Use the bone diagram to identify the bones and complete table below:

Owl Pellet Results Table

Bone Type	Animals Identified	Number Found
Skull		
Jaw		
Scapula		
Forelimb		
Hindlimb		
Pelvic Bone		
Rib		
Vertebrae		
Unknown		