



Petroglyph Point and Owls

Overview

Students learn a brief history behind Petroglyph Point and the Barn Owls that currently live there. Students will learn owl adaptations and dissect an owl pellet.

California Science Standards

Grade 5: 6a.g.-L.S.

Oregon Science Standards

Grade 5: 1L.1, 2L.2, 3S.1

Grade 6: 2L.2

National Standards

Content Standard A:

Science as Inquiry

Content Standard C:

Life Sciences

Materials Included

- * Student Journal
- * Bone Identification Charts

Materials Needed

- * Glue
- * Black Paper
- * Owl Pellets

Activity Time

Preparation: 20 min.
Activity Time: 40 min.

Best Season

All Seasons

Vocabulary

- * Petroglyph
- * Pictograph
- * Adaptation
- * Food Web

Grade Level: 3rd-8th (O.S.S 5th-6th) (C.S.S: 5th)

Learner Objectives

Student will:

- Define petroglyph and pictograph
- Understand adaptation and provide four examples of Barn Owl adaptations
- Identify and classify bones

Background Information

Petroglyphs are art forms that have been carved or chiseled into the face of a rock; where as pictographs are painted onto the rock face. Lava Beds National Monument is one of the best places in California to see both forms of rock art. On Petroglyph Point there are over 5,000 petroglyphs carved and chiseled onto the cliffs with bone, antler or stick tools. While most petroglyphs created by southwestern groups of people are often related to hunting, the petroglyphs on Petroglyph Point uniquely focus on astronomical features and geometric patterns. Often times, rock art is associated with the supernatural and spiritual ceremony. It is impossible to know the meanings behind the rock art at Lava Beds National Monument as no ethnographic study of the Modoc peoples and culture was conducted before the Modoc War.

Prior to the draining of Tule Lake in the early part of the 20th century for agriculture uses, Petroglyph Point was an island within Tule Lake. Modoc peoples and their ancestors reached the island by canoes made from Tule reeds. Geologists studying Tule Lake believed that the water level of Tule Lake changed over the course of history. The petroglyphs on Petroglyph Point were likely to have been created by the Modoc people and their ancestors during three periods of drier climate and lower water levels: between 6,400 to 5,700 years ago, 4,500 to 2,600 years ago, and within the last 500 years. These different dry periods also explain the different levels of petroglyphs seen on the rock. Today, Petroglyph Point is no longer an island within Tule Lake, but an ideal nesting habitat for several species of resident and migrating birds at Lava Beds National Monument.

In the cavities, crevices, and atop Petroglyph Point 14 different species of birds have been recorded to roost and breed in the spring and summer months, including five raptor species: American Kestrel, Prairie Falcon, Red-tailed Hawk, Great Horned Owl, and Barn Owl. Lava Beds National

Background Information

Monument is home to a great number of raptors because of the large population of small mammals that live in the sagebrush steppe and western juniper woodlands, which provide an excellent food source. Of the raptors breeding at Petroglyph Point, Barn Owls nest and roost in the highest density. In the spring and summer 10 breeding pairs inhabit the rock. If you look above the whitewash 20 feet up Petroglyph Point it is possible to see the Barn Owls in their roosts.

A nocturnal species, Barn Owls hunt from an hour after sunset to an hour before sunrise. Barn Owls have evolved multiple adaptations for successful night time hunting in grasslands, deserts, marshes, agricultural fields, and even metropolitan areas. Although Barn Owls have smaller eyes compared to other species of owl, they have excellent low light vision. Barn Owl eyes are twice as sensitive to light as human eyes. Their heart-shaped face plays an important role in the birds nocturnal hunting. The dense, web-like feathers around the Barn Owls faces funnel sounds directly to their ear openings. Barn Owls have asymmetrical ear discs set at different angles giving them exceptional directional hearing. When hunting at night Barn Owls will use sound to pinpoint prey not only in the dark but also dense vegetation and snow! Barn Owls will memorize the different sounds that different prey make and will return to the same hunting spot until they are no longer successful at finding food.

Another adaptation that Barn Owls have to aid in nocturnal hunting is specially adapted primary, or flight, feathers. The primary feathers are covered with tiny hairs and a row of tiny hooks that muffles the sound of wing beats. Silent flight helps Barn Owls focus on sounds of potential prey and hunt without being heard. Large strong wings and powerful talons allow Barn Owls to capture prey that is larger and heavier than they are.

Rodents, shrews, bats, and rabbits make up the majority of a Barn Owls diet. Barn Owls swallow prey whole in one gulp, if it can fit. Otherwise prey is torn with the owl's sharp beak and eaten in pieces. Regardless if swallowed whole or in pieces Barn Owls consume all parts of their prey - hair and bones included. The indigestible parts of the prey (fur, feathers, bones, teeth) are compressed in the gizzard into a pellet. The pellet is regurgitated 12 to 24 hours after eating. Pellets vary in size and shape depending on the size of the owl: the larger the owl the bigger the pellet. Biologists use owl pellets to learn about an owl's diet as well as learn about the food web.

Petroglyph Point Breeders

- * Barn Owls
- *Great Horned Owl
- *Prairie Falcon
- *Red-tailed Hawk
- *American Kestrel
- *Cliff Swallow
- *White-throated Swift
- *Rock Pigeon
- *Common Raven
- *European Starlings
- *House Sparrows
- *Canada Goose
- *Rock Wren



Photo by Don Baccus

Barn Owl Pellet Retailers

Owl pellets can be ordered online.

You can order pellets through:
Pellet.com

Owl Brand Discovery Kits:
<http://www.obdk.com/>

Mountain Home
Biological: <http://www.pelletlab.com/>

Lesson Plan

Getting Ready!

1. Order Barn Owl pellets for student dissection. (See side panel on previous page for list of retailers.)
2. Read background information.
3. Make copies of the *Student Journal: Owls and Petroglyph Point* and *Skeleton Identification Keys*.

Discuss!

1. Discuss the cultural and historical importance of Petroglyph Point.
2. Explain to students that they will be going on a field trip to Petroglyph Point where they will investigate the rock art as well as the birds that live on the cliff.
3. Tell students that one of the birds found at Petroglyph Point is the Barn Owl.
4. Define adaptation for students and ask them to provide examples of Barn Owl adaptations. You may receive answers like talons, hooked beak, large eyes, etc.
5. Write Barn Owl adaptations on the board and discuss each one with students.
6. Share with students that Barn Owls, and all raptors, eat all parts of their prey. Ask students what they think happens to the parts that are not easily digestible?
7. Discuss with students the definition of an owl pellet.
8. Tell students that they will work in pairs or groups of three to dissect a Barn Owl pellet!

Investigate!

1. Have students work in pairs or groups of three.
2. Each student group should have copies of the student journal, identification charts, black construction paper, tweezers, magnifying glasses, and glue.
3. Have students pull apart the Barn Owl pellet with tweezers and separate bones and hair into two piles. The bones should be placed on the black construction paper for identification.
4. Have students record their observations as they pull apart the owl pellet.
5. Once all bones and hair are removed have students identify the animal bones using the bone identification charts to determine what type of bone and to what animal (bird, reptile, mammal) the bone belongs.
6. Tally each type of bone in the student journal.
7. Students should work together to try and reconstruct partial or

Protecting Rock Art:

The petroglyphs and pictographs at Lava Beds National Monument are part of the rich natural and cultural history that the National Park Service is mandated to protect. When visiting the monument it is important to help protect the rock images. Report any vandalism to a park ranger immediately.



Petroglyphs at Petroglyph Point
Photo by NPS

Adaptation:

Modifications, or changes, by which a species improves its condition in relationship to its environment over generations.

