**Lesson 1: All About Owls**

**Lesson Summary:**  This lesson helps students to understand the physical and behavioral adaptations of owls, how these adaptations help them survive and how these adaptations affect what they eat.

**Materials:**

* Tennis ball
* Smooth rope
* Frayed rope
* Pens/Pencils/Paper
* All About Owls PPT

**Knowledge and Skills developed:**

* Recognize talons, hooked beak, big eyes, frayed feather tips, off set ears, and camouflage as essential adaptations for survival.
* Recognition of an owl as a carnivore.
* Recognize that different species of owls live throughout Oregon.

**Next Generation Science Standards**

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| **Practices** ☐Asking questions ☐Developing and using models ☐ Planning / carrying out investigations ☐Analyzing / interpreting data ☐Math / computational thinking  **x** Constructing explanations ☐Engaging in argument from evidence ☐Obtaining / evaluate / communicate | **Crosscutting Concepts** ☐ Patterns **x** Cause and effect: Mechanism / explanation ☐ Scale, proportion, and quantity  **x** Systems and system models  **x** Energy / matter: Flows, cycles, conservation ☐Structure and function ☐Stability and change |
| **Disciplinary Core Ideas and Concepts**  3-LS4.C: Adaptation  3-LS4.D: Biodiversity and Humans  MS-LS2.A: Interdependent Relationships in Ecosystems | |

**Environmental Literacy Strands**

1. Understand the physical and biological world and our interdependent relationship with it

3. Sense of place, region, nation, and global community

**Teacher Background Information:** Although there are many types of owls that live in many different environments, owls share several structural and functional adaptations that attribute to their success as a species. These adaptations allow owls to survive and reproduce within their habitats.

The way of life that a species, such as an owl, pursues within its habitat is called a niche. In other words, a niche is the role that a species plays in its habitat. An organism’s niche is composed of both biotic and abiotic parts. Some biotic factors that help define a niche are food sources and predators. Each species needs a specific type of food, and this is also true for different owls. Some larger owls may hunt small mammals, while smaller owls may eat insects. Temperature, the amount of sunlight, and water are abiotic factors. The snowy owl can thrive in arctic environments, whereas the burrowing owl is much more suited to high desert areas. All of the biotic and abiotic factors taken together help define an organism’s niche. In order to survive and thrive in their environments, owls possess multiple physiological adaptations that make them effective predators. Variations of these adaptations also allow owls to live in different climates and regions, from old forests to arctic tundra, and consume different types of food.

Owls also interact with other species, and these interactions can influence their success in an environment and role in the overall ecosystem. Owls are predators, which means that they hunt and eat smaller prey, such as small mammals and other birds. They may also compete with other species for resources and territory.

**Introduction:**

Let students know that they are going to learn about some amazing nighttime hunters that live throughout Oregon, owls. Tell them that they will discover their special adaptations and learn about what they eat.

**The Core Lesson:**

1. Gauge how many students have seen owls before.

* Ask students to raise their hands if they’ve ever seen an owl?
* Where have you seen this animal?
* What time of day was it? (talk about diurnal/nocturnal)

1. Use the “Lesson 1: Owls” PPT to talk about owl adaptations. Talk about the word adaptation, ask students if they have any cool adaptations or built-in tools they use each day to find food or eat their food?
2. Tell students that they are going to discuss what special built- in hunting tools owls have. Project a picture of an owl and encourage students to make observations**.** Have students talk with a partner and identify at least 2 built-in “tools” that the owl might use to hunt with. Have students share the owl’s hunting “tools” they observed and record them onto the board.
3. Continue through the “Lesson 1: Owls” PPT to talk about each of the “tools” that an owl would use for hunting.

* **Talons**--what are these sharp talons for?
* **Beak**—what does this type of beak do? Does it look like the type of beak a pigeon has?
* **Skull & tennis ball**
  + Emphasize that owls primarily hunt at night.
  + Point out the huge amount of space an owl’s eyes consume in the skull.
  + If our eyes were proportional to our heads - the way an owl’s eyes are - our eyes would be at least as big as tennis balls, if not bigger!
  + Their eyes can’t move—thus bigger eyes, and why they move their heads so far around!
* **Off-set ears**---The “horns” on a great horned owl are actually not its ears. These horns are just long feathers used mainly for camouflage. The owl’s ears are offset on either side of the head right behind the eyes.
  + Have students hold one hand above their left ear and one hand below their right ear. This is about were an owl’s ears are found.
  + Owls can hear a prey animal up to a mile away!
  + Offset ears allow the owl to ***triangulate*** sound and determine with incredible accuracy the distance to the animal.
  + This is important because if the owl misses catching something by even an inch, it will go hungry.
  + Owls ears have flaps that allow as much sounds in as they need.
* **Demonstrate triangulation**– Select two students – who will be the “ears” - from opposite sides of the classroom. Have them stand and close their eyes.
  + - Select a student to be the mouse by tapping them on the shoulder (you don’t want the ‘ears’ to hear who is the mouse).
    - Tell the ‘ears’ that when they hear a mouse squeak, they need to point in the direction of the sound WITHOUT opening their eyes.
    - Have the student mouse squeak.
    - Have the ‘ears’ keep their hands up & pointing. Allow them to open their eyes.
    - Demonstrate how with only one ear, you can determine the DIRECTION of the sound, but not the DISTANCE. The mouse could be any student sitting in the direction that the ‘ear’ is pointing.
    - Have the students imagine following a line from both the ears. Where do they cross? Right over the mouse! X marks the spot, thus you have demonstrated triangulation.
* **Frayed feathers/Silent Flight –** Owls can fly without making a noise. How do they do it? Owl wings are specially adapted and are not the same as the wings of other birds, which make noise in flight.
  + Demonstrate the difference between the two types of wing with the two pieces of rope (one frayed, one smooth).
  + First, swing the smooth rope. You should be able to hear it whistle. Birds that have smooth edges to their wings & feathers, like this rope, will make noise.
  + Now swing the frayed rope. It should be quiet. An owl’s wings may look worn on the edge; but that ‘rough’ or ‘frayed’ edge actually helps them fly QUIET – just like the rope.
  + Why would silent flight be important for an owl?

4.) Have students take a guess or make a hypothesis about what they think owls eat. Have them consider the owl’s “tools”/adaptation they just observed.

* Write up their answers on the board in a column next to their “built-in tools”/adaptations
* Compare food hypotheses with tools—do they seem to make sense? Does an owl need talons to eat a banana? How about seeds? Would they need to fly silently to catch an apple?

5.) Ask students, “do all owls eat the same food?“ Tell them that they are going to do an activity to learn more about how owls are specifically adapted to live in their individual environments and to eat different prey items.

6.) Show students pictures of the different species of owls found in Oregon. Ask the students to discuss in pairs the similarities and differences of the owls. Have students imagine the place where each owl lives. Ask students to think about how each owl looks and whether features help it to live where it lives. Talk about the different adaptations of each owl species.

7.) Divide students into pairs or groups and let them know that they are going to choose an owl species that they are interested in and “Fact Sheet”. Provide them with the Oregon Department of Fish and Wildlife Facts for Kids handout and any other useful resources. Have students include on their Fact Sheet:

* The specific elements of their owl’s habitat:
  + Where does it live?
  + How much space does it need?
  + What does it eat?
  + Who eats it?
  + Who in the ecosystem would be affected if this owl were no longer there?
* 1 interesting fact about their owl
* One question that they have about their owl

9.) Have students display Fact Sheets and share with one and other what they have learned about owls and where they live. Discuss how each environment has characteristic life forms that have adapted to climate, kinds of available food, and other factors. Emphasize that all animals are adapted to live in their environment.

**Resources:**

**Adapted from:**

*Whoo’s for Dinner?* Audubon Society of Greater Denver and

*What Bear Goes Where?* Project Wild K-12 Curriculum & Activity Guide

*2012 Santiam Stewards Outdoor School Guide*, US Forest Service

