

Nocturnal Nation

SDH 2017

OVERVIEW:

Nocturnal animals can be fascinating! Using minimal props and an amazing evening hike, students have an opportunity to understand, appreciate, and feel comfortable in the nighttime environment we traditionally shy away from.

OBJECTIVES:

Students will be able to:

- ✓ Identify local nocturnal animals and their adaptations
- ✓ Describe the relationships nocturnal animals have with the ecosystem
- ✓ Give examples of environmentally responsible choices related to nocturnal animals

VOCABULARY:

Asymmetrical Hearing Cones Crepuscular Diurnal
Nocturnal Rods

NEXT GENERATION SCIENCE STANDARDS:

- ✓ Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors affect the probability of successful reproduction of animals. (MS-LS1-4)
- ✓ Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. (MS-LS1-5)
- ✓ Cause and effect relationships may be used to predict phenomena in natural systems (MS-LS1-8)

MATERIALS:

Flashlight

Strips/Squares of colored paper

PROCEDURES:

1. Introductory Activity: Color Blind at Night (found in activity glossary)
 - A. In a dark location, pass out paper and have students share with a partner the color they see. Keep lights off.
 - B. Debrief: What is active at night? (Our imaginations! But also, for this class - nocturnal animals). Which animals are active in the San Bernardino National Forest at night? (raccoons, flying squirrels, bats, owls, rodents) Tell students that this slip of paper will help them understand the adaptations animals have to survive in the night.
 - C. Ask students what **nocturnal** means.
 - D. Explain the difference between nocturnal (active at night), **diurnal** (active during the day), and **crepuscular** animals (active during dusk and dawn).
2. Visual/Auditory Adaptations of Nocturnal Animals Discussion
 - A. Night-time animals have a much higher density of **rods** in their eyes and daytime animals have a much higher density of **cones**. Have students try and report the color of their friend's jacket. Is the color bolder in a well lit area or in the dark? - great for black and white vision, good at distinguishing contrast. **Cones**- great for color vision and detail.
 - B. Using your flash light, this is a good time to quickly reveal the actual color of the paper from the opening activity.
 - C. Big eyes mean bigger pupils, allowing the animal to capture more scattered light. Pupils dilate as animals are in the dark longer.
 - i. Activity: One-Eyed Jack Story (found in activity glossary)
 - ii. What adaptation do humans have to help us see better at night? (pupils dilate) How was your vision between the two eyes? (eye covered during story: lighter, but blurry; uncovered eye: dark, sharper) Why? How do some animals adjust their pupils even more quickly than humans? (cats, slit pupil more effective)
 - D. Have students hypothesize other senses that would be heightened in nocturnal animals (hearing).

- E. Ask students if they know about **asymmetrical hearing**. Explain that it is when ears are placed at varying heights on the skull. For example, saw-whet owls in the San Bernardino forest have this adaptation, allowing them to judge depth perception through hearing, which means they can hunt in complete darkness. Not all owls have this adaptation though. Great horned owls lack it, which means they must have at least slight ambient light to hunt.
3. Experiment: Solo Walk
- A. Facilitate 'walk'.
 - B. Debrief: How was walking in the forest at night different than during the day? Focus on sensory awareness.
 - C. Discuss what students heard, saw or felt. Encourage students to hypothesize and make predictions about their findings. Discuss trust and how active imaginations can get in unfamiliar, yet safe, environments.
4. Wrap Up
- A. [What?] Concisely review the major points of the lesson, all the way back from the introductory activity.
 - B. [So what?] What was important for you to discover from the lesson? Why was it important for all of us to take this class?
 - C. [Now what?] What can you now do with this information? What changes can you make in your life? What can you teach to others? Who will you tell? What will you say?
 - D. Pass out beads after all students have contributed.

THINGS TO THINK ABOUT:

Special Needs and Weather: Just like any night time activity, you need to be aware of students getting cold and scared. Make sure they are dressed warmly, bring blue pads if needed and have students walk with a buddy to avoid falls and being frightened.

Time Fillers: You can add other activities from the Activity Glossary to fill time or hike a little further.