



Night Hike

Program Goals:

Students will explore Upham Woods at night and learn about the special adaptations of nocturnal animals. Sensory awareness activities during the hike will teach students how to better use their night vision and other senses to navigate more comfortably in the dark.

Program Length: 45-90 Minutes

Ages: Grades 5th – Adult

Maximum Number of Participants: 20

Objectives:

After the hike, students will be able to:

- Identify three nocturnal animals and how they are adapted to the night.
- Explain what night vision is and how it works.
- Use all their senses more comfortably in the dark.

Wisconsin Standards:

A.12.1 Participate regularly in health-enhancing fitness activities such as games, sports, dance, outdoor pursuits, and other physical activities that contribute to the maintenance of wellness, independent of class requirements

B.8.3 Explain the importance of biodiversity

F.8.2 Show how organisms have adapted structures to match their functions, providing means of encouraging individual and group survival within specific environments

F.8.8 Show through investigations how organisms both depend on and contribute to the balance or imbalance of populations and/or ecosystems, which in turn contribute to the total system of life on the planet

Background:

Many wild animals at Upham Woods are active during the night, whether *nocturnal* (active only at night) or *crepuscular* (active only at dusk and dawn). By adapting to the night, these animals fill specific *niches* or roles in their habitats and reduce competition for resources among all animals. This allows diurnal and nocturnal counterparts with similar food sources like hawks and owls to live within the same habitat. Nocturnal animals at Upham Woods include mice, fox, shrews, opossums, raccoons, skunks, owls, bats, and many arthropods (insects, spiders, crayfish, etc.). Some animals like

birds and amphibians migrate at night with the change of seasons in search of breeding and feeding grounds. Deer and woodcocks are examples of crepuscular animals that are commonly active in early morning and evening. *Arrhythmic* animals like rabbits alternate active periods with rest, napping several times each day. Other more familiar animals seen during the day are *diurnal* like squirrels, songbirds and reptiles.

Nocturnal animals have physical and behavioral adaptations that increase survival in their nighttime habitats, including highly developed senses of smell, hearing and eyesight. Nocturnal animals may have bigger eyes and ears, moist noses, darker colors, more distinct vocalizations and quieter movements than their diurnal counterparts.

Most nocturnal animals have adapted protruding eyes and enlarged *pupils* that allow more light to enter the eye and give them *night vision*. Upon entering darkness, human pupils will immediately expand to let in 10 times more light. Within 5 minutes, a human's pupils are sensitive to 100 times more light. Full night vision is reached after 45 to 60 minutes, when our eyes let in one million times more light. By contrast, an owl's pupils respond in about half that time. In the back of our eyes is a thin layer of light sensitive cells called the *retina*. The retina is made of rod cells and cone cells. *Cone cells*, which are concentrated in the center of the eye, require light and allow us to see color and fine detail. *Rod cells* spread throughout the retina, giving us peripheral vision. Rod cells give us our night vision because they require low light and allow us to see shapes and shadows in the dark.

Preparation:

- Pick your route well in advance and hike it during the day to look for potential hazards on the trail. Also, hike it during the night to familiarize yourself with the terrain.
- Locate Night Hike box and inventory activity supplies.
- Prep your night hike bag with everything you need for the number of people on the hike.

Materials:

- One night hike bag
- Blindfold
- Owl calls (recordings or wooden owl call from "Discovering Owls" box)
- Matching pairs of sound shakers (One film canister per student)
- Crayons with wrappers removed and small pieces of scrap paper.
- Candle and matches

- Wintergreen Lifesavers
- A flashlight with red lens (red cellophane works well)
- Scent canisters
- Magic sniffing potion (bottle of water)
- Optional Materials:
 - A bag of textured materials such as fur, feathers, bone, shell, pine cones, etc.
 - Worry stones
 - Glow-n-the-Dark stars (Charged and ready)
 - Rope

Sample Lesson for 5th Graders (60 minutes):

- I. Introduction to nocturnal animals (10 minutes)
Optional activity: Bat and Moth
- II. Adjusting our senses to the dark:
Disappearing Head Trick (5 minutes)
- III. Listening for night sounds
 - A. Deer ears (5 minutes)
 - B. Owl calls (5 minutes)
 - C. Finding your mate – Sound Shakers (5 minutes)
- IV. Night vision
 - A. Can you see the color? (5 minutes)
 - B. Why pirates wear patches? (5 minutes)
- V. Sense of smell: Magic sniffing potion (5 minutes)
- VI. Conclusion: Creating a spark (5 minutes)

Introduction:

Experiencing nature at night can be fun and exciting. At night, the world is full of sounds and smells much different than the daytime. Different animals are awake. Temperature drops while humidity rises, so students should dress in warm layers. Students often have fears associated with darkness, so take time to recognize and ease these fears. Talk about how you developed a respect for the night. To ensure a safe hike, students should stay behind you and stick together in the dark, perhaps holding hands with a buddy. If a student or group is particularly nervous about hiking in the woods at night, have smooth stones or “worry stones” that they can place in their pockets and rub their worries away. Explain that in order to fully develop our night vision, students will not be allowed to use flashlights. A red filter on your flashlight will allow you to search your bag while retaining your night vision. Begin the hike by encouraging students to be quiet and listen for night sounds so as not to scare away any animals.

What animals might be active at Upham Woods at night? Introduce the words *nocturnal*, *diurnal* and *crepuscular*. Take a specific example and ask the group how this animal is able to survive at night.

If you were only active at night, how would you adapt? What would you change about your behavior or your appearance? Briefly discuss adaptations of nocturnal animals. (Example: Bats can see but they use echolocation in the dark to hear the things around them and find food.)

- *Bat and Moth Game:* This game is very similar to “Marco-Polo” and explains how echolocation works. One person is the bat and another is the moth. Both must stand in a circle made by the other players. The bat is blindfolded. The moth must say “moth” every time the bat says, “bat,” thereby simulating an echo. The object of the game is for the bat to rely only on sound to find and tag the moth. To add an extra challenge, add

trees or more moths and bats. The players in the circle must say “tree” every time the bat says, “bat.” A great game for early evening hikes. For more information on echolocation, see the *Bat Program*.

Adjusting our senses to the dark:

Our eyes can play tricks on us in the dark. As you begin the hike, students may notice that they need to rely more on their feet and less on their eyes to feel out the bumps on the trail. Following the trail can be difficult because our eyes can play tricks on us in the dark.

- *Disappearing Head Trick:* Pair up students and have each focus on his/her partner’s face. They will notice their partners’ heads begin to disappear. Simply shift your eyes back and forth to make the head reappear. (A less scary version of this is the Disappearing Thumb Trick.) Explain the differences between cones and rods and their different locations in our eyes. *What would happen if you stared straight ahead on the trail?* It would disappear because the cones in the center of our eyes need light to work. To avoid getting lost at night, use your peripheral vision, the rods around your eyes.

Listening for night sounds:

Why are some animals active at night and not during the day? Discuss competition for resources and predator-prey relationships. Many animals rely on the dark for protection from predators and have adapted a better sense of hearing to avoid danger. Likewise, nocturnal predators like owls and bats have a highly developed sense of hearing for hunting their prey. Many of these animals also use sound to communicate at night to find a mate, defend territory or find their young.

- *Deer Ears:* Ask the students to think of nocturnal animals with big ears. Bats and deer are common. Have students make “deer ears” by placing cupped hands behind their ears. Have the students alternate between deer ears and people ears. *Which gives us better hearing, big ears or small ears?*
- *Sound Shakers:* This activity will allow students to communicate in the dark by using their ears. *What animals communicate at night?* Frogs, insects and birds all call to attract a mate. The cicada is one type of insect that buzzes in summer to its mate. Ask the students to imagine themselves as different insects with specific calls. Give each student a sound shaker. Each student must find his/her mate by shaking the film canister and listening for a match. *What were some difficulties you experienced in finding your mate?* The night is full of sounds, but not all insects communicate this way. Moths use scents or *pheromones* to attract mates while lightning bugs flash light patterns.
- *Owl Calls:* Like nocturnal animals, we depend more on our sense of hearing to hear things we cannot see on the night hike. Depending on the season, Barred and Great Horned Owls can be heard at Upham Woods. Have a wooden owl call, a small tape player with recorded owls calls, or your best impersonation ready. Check out the Night Hike folder on either computer in the office for a

guide to night sounds. Here are some tricks to remembering the calls. Barred owls say, “Who cooks for you? Who cooks for you all?” Great Horned Owls say, “Whose awake? Me, too.” *Why do owls call at night?*

Remember owl prowl ethics when calling for owls. Do not call owls away from their nests in late winter nor attract big owls to prey on smaller owls. If you successfully attract an owl to the area, you may be able to spot it with your flashlight. For more information about owls, see the *Discovering Owls* lesson.

This same activity can be used to listen for frogs and toads in the spring and summer. Check out EEK! – Know Your Frogs @ <http://www.dnr.state.wi.us/org/caer/ce/EEK/critter/amphibian/frogident.htm>

Night vision:

How has your night vision changed since the night hike began? Are you able to make out different shapes? Can you see any colors? Many will believe they can see color, but the next activity will prove them wrong. Explain that light allows us to see color, referring back to cones in our eyes. Rods give us night vision but only allow us to see shades of gray.

- *Can you see color?* Give each student a piece of white scrap paper and an unwrapped crayon. Ask them to draw a picture of something they enjoy about Upham Woods. On the other side, write what crayon color they think they have. Return the crayons to the bag and have the students put their drawing in their pocket. At the end of the hike they can use a light to see if the color they wrote matches the color of the drawing.
- *Why do pirates wear patches?* No, this is not a joke about hooks. The answer is simple, the pirates cover one eye until they capture a boat. Then as they head into the dark black hull of the ship, they uncover their eye and search for hiding enemies or hidden loot. The story below gives students a chance to play with their night vision. Have the students sit in a circle and cover one eye with a hand. This is the patch that blocks out all light. Now light a candle and don you best pirate accent.

Once upon a time, there lived two rival pirates, Captain RedBeard and Captain BlackBeard. Both traveled far and wide throughout the Great Lakes in search of the lost treasure, but only one had the treasure map. Captain RedBeard took great care to protect the treasure map from Captain BlackBeard so that he might be the first to find the hidden treasure. On a night

much like tonight, Captain RedBeard went below deck to study his charts and treasure map, believing he was now only a few days’ journey away from the treasure. What Captain RedBeard did not realize was that Captain BlackBeard’s ship had been following him in the dark night, plotting to take over Captain RedBeard’s ship and steal the treasure map. At that very moment, Captain BlackBeard’s crew attacked, coming aboard the ship. Captain RedBeard heard the commotion above deck, quickly hid the map and waited for Captain BlackBeard below. As soon as Captain BlackBeard came into the light, Captain RedBeard blew out the candle, switched his eye patch to the other eye and used his night vision to fight poor Captain BlackBeard who was surprised by the candlelight and immediately lost his night vision. And that is why pirates wear patches.

Blow out the candle and have the students switch their eye patch. Look around. Now switch from eye to eye. *Which eye has better night vision, the eye with the patch or the eye that sees by candlelight?* It takes people about 45 minutes to fully gain their night vision, so pirates keep one eye in the dark, under a patch.

Sense of smell:

Nocturnal animals have adapted ways to better see and hear in the dark. Review these adaptations. *What are some other ways in which nocturnal animals have adapted to the dark?* Canines have adapted a strong sense of smell for hunting food and sniffing out danger in the dark. Fox, coyotes, and even pet dogs have cold, wet noses that attract and hold scent molecules, making them excellent odor detectors. These animals keep their noses to the ground or high in the wind following scent tracks as they hunt for prey.

- *Magic sniffing potion:* Pass around a mildly scented canister or natural object (garlic mustard, pine needles, etc.). Next, place a drop of water on each student’s finger to wet his/her nose. Snow is a good substitute in the winter. Again pass around the same object to be smelled. *Which gave a stronger sense of smell, a dry nose or a wet nose?*

Conclusion:

Review the nocturnal animals you discussed and any animals you heard. What is an example of a nocturnal adaptation? Think about our five senses and how we used our senses differently on this hike. Discuss night vision and how it changed from the beginning to the end of the hike. *What was one thing you learned or really enjoyed on the night hike?*

- *Creating a spark:* One fun activity to end a night hike is a story about Moon Rocks. *One of the first important people at Camp Upham Woods was Ranger Mac. This is a story that not many people know about him.*

One day, Ranger Mac was hiking across Black Hawk Island when he saw something strange in the distance. It was a mound of very white, very round rocks like nothing he had seen before, rocks so white they practically glowed. Ranger Mac had never noticed these strange rocks before, even though he had hiked this exact same trail the day before. He knew the rocks were rare, so he took some back to the mainland and put them in the nature center. A few days later, NASA scientists came to Upham Woods wondering if anyone had seen any of these strange rocks in the area. Ranger Mac took the scientists across the river in the barge and led them to the mound. The scientists began studying the rocks and quickly determined that the rocks were actually meteors that had fallen from space. The rocks were made of the same stuff found on the moon! Ranger Mac was delighted; moon rocks right here at Upham Woods! The NASA scientists loaded the rocks onto the barge and took them back to their laboratory, all except for the rocks in the nature center. Ranger Mac kept these rocks secret and studied them on his own. He even tried eating one and discovered a great secret! Each year, he would share his secret with new campers, and when Ranger Mac left Upham Woods, he left his secret moon rocks, too. I would like to share these moon rocks with you tonight and keep the secret alive. Please find a partner and hold out your hand. Place the moon rock in the back of your mouth and crunch down with your mouth open so your partner can witness the secret.

Give the students pieces of Wintergreen Lifesavers (Wintergreen Altoids also work, with an extra kick!). Students should try to dry their mouths before chewing to better their sparking ability. *Why does it spark?* It's called *triboluminescence* and is the result of fracturing sugar crystals. The spark is a safe and natural chemical reaction, giving off a small burst of energy that is visible to our eyes.

This is just one example of a night hike you can do. Remember to be creative and have fun! Adjust your hike depending on the season, length of program and the age of the group.

Additional Activities:

- **Feeling the Hike:** Discuss touch and how it will help on the hike. One example is to feel with your feet. Take the students off the trail. Does it feel different on versus off the trail? Feel around with your hands for any trees nearby. Ask the students to describe the tree bark.
Pass around the different touching materials in the bag. Ask the students to feel but not speak. At the end ask them to identify the items.
- **Constellations:** During the winter when the days are shorter, you might be able to stargaze. If properly dressed, students can lay down in the sandlot. Looking up in the sky, talk about constellations. Identify some for them and have them identify some for you. Find a story about your favorite constellation and share it with the students. For more information, see the *Star Stories* lesson.
- **Solo Walks:** Allow the students to spread out on the trail while you lead the way. Form a line and give each student a few feet of space. Walking in silence, the students will experience a sense of being alone in the woods. Remember to have an adult in the back to keep the group together. For a nervous group, use a rope that everyone can hold on to with a few steps between each student. This is a safe way to overcome fears of the dark and experience an oneness with the night. Glow-in-the-dark stars are also a fun way to leave a trail for the students to follow. The last person in line picks up the stars and returns them to you at the end of the hike.
- **Nighttime Poetry:** Ask the students to write one or two words on a scrap of paper to describing their feelings about the night. Read the words in random order to create a poem about the night. This activity can be used when discussing nighttime fears.
- **Precautionary Prey:** A great game for early evening hikes. Requires a blindfold and small stuffed toy. Have the students form a circle and remain as quiet as possible. The toy is the prey and one student is the parent in charge of protecting the prey. A parent is chosen and stands blindfolded in the middle of the circle with the toy at his/her feet. Another student from the circle is silently selected as the predator and must move quietly into the circle and try to capture the prey. *The object of the game:* the parent must listen and point at the predator before the predator captures the prey. If the parent successfully points, the predator is out and another predator is silently chosen. If the predator can capture the prey without being pointed at, the predator becomes the new blindfolded parent. Discuss nocturnal adaptations among predators and prey. *How do nocturnal animals sense danger in the dark aside from sound? How would the prey react in the wild to a predator approaching? What would happen if everyone were noisy during this game?*

References:

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