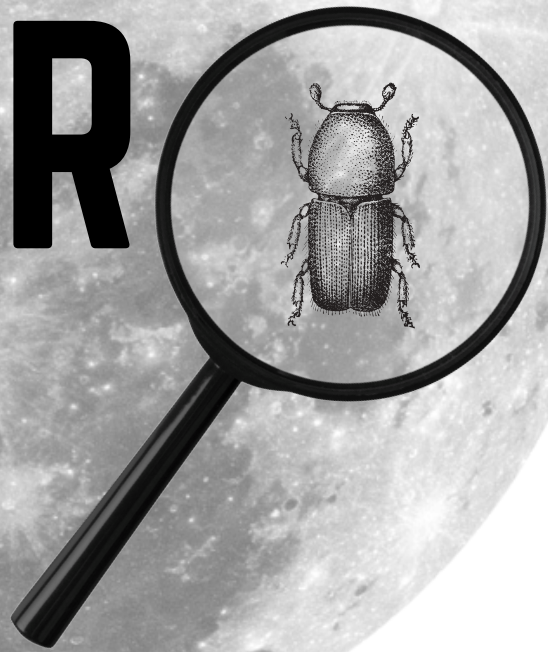


The Environmental Learning Center



NATURE NEAR YOU

Creatures of
the Night



Visit our website for more info:
<https://www.discoverelc.org/nature-near-you-kits>
Questions? Or to register for the virtual meetups,
e-mail education@discoverelc.org

Nature Near You Kits were made possible by generous support from:





The Environmental Learning Center

NATURE NEAR YOU

Creatures of the Night

Materials Included:

- Paper cups
- Paper tube
- Paper bowls
- Construction paper
- Origami paper
- Eye mask
- Chalk
- Pencil
- Key chain flashlight
- Owl pellet
- Owl pellet bone identification chart

When the sun sets and the animals that are awake during the day make their way to dens, nests, or other safe areas to rest for the night, other animals, well-adapted to living in the dark begin to make their appearance. The first to become active are the **crepuscular** animals, those that are awake at dawn and dusk. **Nocturnal** animals, those that are awake in the night, soon follow.

These crepuscular and nocturnal animals are uniquely adapted to finding food, avoiding becoming prey for another nocturnal hunter, and surviving in the darkness. In this Nature Near You kit, we invite you to learn more about the fascinating lives of the animals that are awake while we are sleeping. You will learn about some of the most famous night time animals and test your own senses' ability to adjust to life with less light.

VOCABULARY

- **Diurnal:** occurring or active during the day
- **Nocturnal:** occurring or active at night
- **Crepuscular:** occurring or active at dawn and dusk
- **Adaptation:** something that helps a living thing survive in its environment
- **Amplify:** to make louder
- **Echolocation:** an ability to find an object by bouncing sound
- **Night Vision:** The ability to see in low light conditions such as dusk and night
- **Dilate:** the widening of the pupils of your eyes
- **Bioluminescent:** a living organisms ability to produce light.

Happy Exploring!

The Environmental Learning Center

NOCTURNAL EARS: A DESIGN CHALLENGE

Many nocturnal animals depend on their sense of hearing to find prey, avoid getting eaten, and survive in the darkness. Using some nocturnal creatures' unique ears as inspiration, can you design a device that might help you hear better in the dark?

Materials Needed:

- Paper cups (provided)
- Paper tube (provided)
- Paper bowls (provided)
- Construction paper (provided)
- Scissors
- Tape or glue

Design Challenge Instructions:

For many years, people have been designing devices to help improve human hearing. Before the invention of the hearing aid, an ear trumpet was one such invention.



Using the materials provided (and some nocturnal animal inspiration), see if you can design a device that will help you to amplify sounds and hear what you might have otherwise missed. Then, test your invention and try to improve your design.

Photos of historic hearing devices from: Wellcome Library, London

Inspiring Ears

Nocturnal animals' ears are specially adapted to improve their hearing. From special shapes to unique placement, you may find inspiration in one of these animals for your own design.



Many nocturnal animals have very large or cup shaped ears to help them capture sounds.

Nocturnal animals may move their ears so they point in the direction from which the sound is coming.



Some animals, such as owls, have one ear much higher than the other, which helps the owl figure out the origin of a sound.



The Environmental Learning Center

ECHOLOCATION

Many animals will use sound to "see" when it is dark outside. Much like sonar, these creatures will make a noise that bounces back to them, informing them about their surroundings. This technique is called **echolocation** and is used by bats to catch flying insects once the sun goes down.

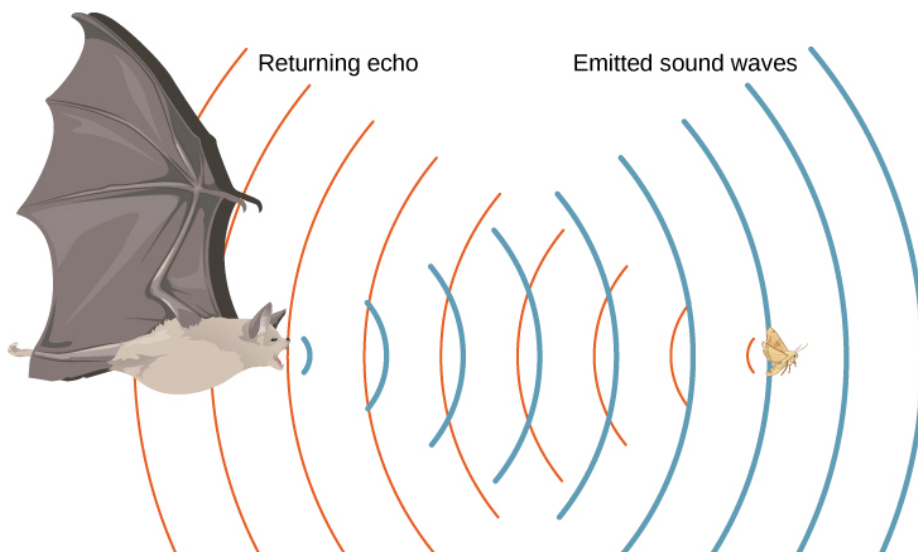


Materials Needed:

- Eye mask(provided)
- Hard surface (like a textbook)
- Soft surface (like a pillow)

Instructions:

1. Ask a friend or adult to help you with your echolocation experiment.
2. Put on your mask and make sure you can't see anything.
3. Have your helper snap around you to see if you can locate where they are snapping.
4. Now have them hold up different objects, like the pillow.
5. Make noises (chirps, snaps, clicks) and see if you can guess if the object they are holding is hard or soft. How does the sound change?



Echolocation

- Bats are known to move their ears when they echo-locate much like humans move their eyes when they are watching something.
- Their ears are sometimes compared to satellite dishes, rotating to catch a signal.
- Bat echolocation are quick, high-frequency clicks that are usually too high-pitched for humans to hear.
- This ability is so fine-tuned that a bat can detect something as tiny as human hair.
- Some humans who are blind have learned the ability to echolocate, moving their whole head to receive the sound since we can't move our ears.
- Daniel Kish, a blind man, most famously uses this ability to ride a bike. You can watch this amazing feat online.
- The skill of echolocation can be learned by just about anyone, as long as you're willing to practice!

The Environmental Learning Center

HOP, SKIP, JUMP

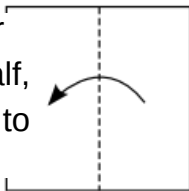
The majority of frogs are nocturnal, and although you may not be able to see them at night, you can definitely hear them. This chorus of croaking is unique to each frog species, and you can identify them by their unique ribbit. Follow the sound of their voice, until you spot them hopping. See if you can tell how far they jump. This can be another useful way to identify the frog, with some frogs jumping up to 60 times their body length! In this activity you will create an origami frog and see how far your own frog can jump!

Materials Needed:

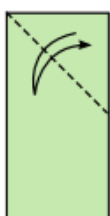
- Origami paper (provided)
- Ruler (optional)

Instructions:

1. Fold your paper in half, being sure to line up the corners.



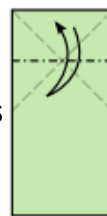
2. Fold the top right corner down to align with the side edge. Unfold.



3. Do the same with the left corner. Unfold.



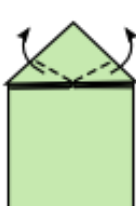
4. Fold the top down so that the crease intersects through the X. Unfold.



5. At the center line, fold the outer edges in to meet.



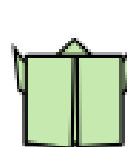
6. Fold the top two flaps upwards, at an angle to create the front feet.



7. Fold the bottom half so that the sides meet in the middle. And fold up



8. Fold the square on top in half, so that the top meets the bottom.



Florida Frogs



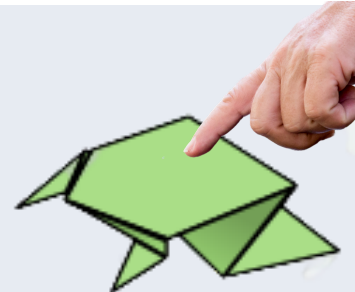
Barking tree frogs
can jump up to 30 inches.



Spring peepers
can jump up to 17 inches.



Cricket frogs
can jump up to 75 inches.



Press the back of **your frog** to see how far it can jump

To identify Florida frogs based on their ribbit, visit the website below:

<https://www.floridamuseum.ufl.edu/science/florida-frog-calls/#:~:text=They%20call%20out%20for%20breeding,Florida%20Museum%20of%20Natural%20History.>

The Environmental Learning Center

NIGHT VISION

Owls, panthers, raccoons and possums are **nocturnal** and have specially adapted eyes to help them see in the dark. Usually their eyes are large and round, allowing for a bigger pupil to let in what little amount of light there is. Once the light enters the eye, a special reflective surface bounces light around inside, increasing what they can see! In this activity you will test the dark adaption of your own eyes.

Materials Needed:

- Chalk (provided)
- Cement sidewalk/driveway
- Timer (optional)

Explore:

1. Look in the mirror at your eyeball.
2. The dark circle at the center is your pupil and will change size depending on how much light there is around you.
3. In bright situations your pupil will be small, letting in less light and in dark situations, your pupil will grow large to let in more light.
4. Glance at the light in the room, and quickly turn back to the mirror to watch your pupils change size.

Instructions:

This activity will explore how well your eyes adapt to the dark. This activity is timed, so either be ready to count or have an adult with you to set a timer. Note: you cannot look at a phone or screen in between each attempt.

1. Begin by getting permission from an adult to draw on the concrete near where you live.
2. Decide what nocturnal animal you are going to draw from the list at the right, and maybe do a practice sketch. You will be drawing this animal four times once you go outside.
3. When you are ready, stand in a bright part of your home for 20 seconds.
4. After 20 seconds have passed go outside and immediately start drawing your animal on the concrete with one of your pieces of chalk. Try to add as much detail as possible.
5. Once you are finished, have your helper set their timer for 2 minutes.
6. After the 2 minutes are up, choose a different color of chalk and draw your animal again using as much detail as possible.
7. Repeat this activity 2 more times, with 2 minutes rest in between.
8. Inspect your drawings with a flashlight or in the morning, and see how well your eyes adapted to the dark. How did your drawings change between each attempt? Why?

Why do their eyes appear to shine?



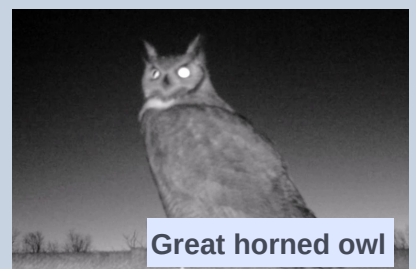
Florida panther



Opossum



Raccoon



Great horned owl

Note: This activity is best done with an adult.

The Environmental Learning Center

FIREFLIES

In the darkness, it can be difficult to locate others, but fireflies have developed a unique way to communicate and find each other in the night. Fireflies flash a **bioluminescent** code to each other that allows each species of firefly to find others of the same species. In this activity, create your own code to see if you can communicate in the dark using only a single light.



Materials Needed:

- Key chain flashlight (provided)
- Pencil (provided)

Instructions:

1. Create and write down a code or a pattern in which you will turn your key chain flashlight on and off. This code will be the answers to questions you may be asked.. Your code might include short and long flashes or different numbers of flashes to mean different answers.
2. Practice creating your answer codes with your key chain flashlight.
3. Find a dark, indoor area. Have someone ask you a question that can be answered using the codes you have created.
4. If you would like, create additional codes and practice your communication in the dark.

Answer	Code
Yes	Example: Short Flash, Off, Short Flash, Off, Short Flash, Off
No	
Maybe	

Bioluminescent Beetles

Although most commonly called fireflies (or sometimes lightning bugs), these insects are not flies at all but rather a type of beetle. What makes fireflies unique, however, is their bioluminescence, or their ability to make their own light. Other living things that are bioluminescent include some species of jellyfish, worms, bacteria, fish, and even sharks!

There are thousands of species of fireflies, and each species produces its own pattern or code of flashing light. Using a special organ called a lantern, which is located on its abdomen, a firefly will start and stop its light in the pattern unique to its species to let others know it is there.



Note: This activity should be done indoors to avoid interfering with firefly communication. For more information on fireflies and light pollution, visit: firefly.org/light-pollution.html

The Environmental Learning Center

OWLS

Owls are expert nocturnal hunters, with eyes and ears well adapted to detecting mice and other prey in the dark. Due to their special feathers, they are able to fly silently to catch their prey. Complete this owl pellet dissection to explore what an owl has been eating.



Materials Needed:

- Owl pellet (provided)
- Owl pellet bone identification chart (provided)
- Newspaper or paper towels (optional)

Origin of an Owl Pellet

Owls are predators that eat lizards, birds, snakes, fish, frogs, mice and other rodents, and more. When owls eat, they will devour everything- including things that are not easily digestible, such as fur, feathers, and bones.

These indigestible parts are pressed into a pellet and expelled through the owl's mouth.



Instructions:

1. Clean the area where you will be doing your dissection and, if desired, cover the area with newspaper or paper towels. Please note that owl pellet dissection can be very messy!
2. Carefully unwrap your owl pellet. Take some time to observe its appearance. Think about the following:
 - a. *How large is your owl pellet? What color is your pellet?*
 - b. *Do you see any signs of fur or feathers?*
 - c. *What do you predict you will find inside?*
3. Use your fingers to gently break open your owl pellet, keeping in mind that many of bones that you find inside may break easily. If you are having trouble breaking open your owl pellet, it might be helpful to spray it with a little bit of water.
4. Working carefully, continue to break your owl pellet apart and remove the fur from the bones that you find. Use your bone identification chart to help identify what you found.
5. After you have completed dissecting your owl pellet, take some time to think about the following:
 - a. *Based on your observations, what do you believe this owl may have been eating?*
 - b. *Why do you think it important to understand what owls eat?*

Note: Although commercial owl pellets are sterilized, it is always a good idea to wash your hands after completing an owl pellet dissection.