CANADIAN WILDLIFE FEDERATION

15-30 minutes

How Does Echolocation Work?

Learning Objectives

1. We can explain the basics of echolocation.
2. We can understand how bats use echolocation to find food.

Method

Students act out the concept of echolocation by becoming “moths” and “bats” in a game of call and response.

Materials

- Blindfold

Background

Since bats are nocturnal (active at night) and have weak eyesight, they use their ears to help them navigate in the darkness and find food.

Echolocation is a technique they use to determine the location of things in their environment. Bats emit a series of high pitch calls and listen for the echoes reflected off nearby objects. The reflected sound travels in waves through the air to their ears. Depending on the location and intensity of the sound, their ears can usually determine the direction of the sound. This allows bats to fly at night, as well as in dark caves. It also allows bats to locate food, such as flying insects.

Other animals, such as dolphins and whales, also use echolocation.

In Advance

- Identify a flat, open space free of obstacles where you will be able to safely conduct the activity.

Safety

- Be aware of any hazards in the area such as rocks jutting out of the ground or low-hanging branches.
- Remind students to walk slowly to avoid tripping while blindfolded.

For additional resources visit:

CanadianWildlifeFederation.ca/Education

Activity

1. Bring the class to the location you chose for the game.
2. Ask:
    - What do you know about bats?
    - What time of day are bats the most active?
    - What do bats eat?
    - How do you think bats find their food?
3. Introduce the concept of echolocation.
    - Explain that some animals, such as bats, use sound to determine where things are in the dark.
    - Explain that bats can tell how far away something is by emitting a call and listening for the sounds as they bounce off nearby objects.
4. Tell students that they will be participating in an activity that illustrates the basic concept of how echolocation works.
5. Choose one student to play the bat in the first round – all other players will be moths to start.
6. Explain the game:
    - The “bat” will stand in one spot and put a blindfold over their eyes. Remind them not to peek!
    - “Moths” will each pick a spot around the playing area to stand in.
    - To begin the game, the bat will call out “echo!”. This simulates a bat emitting a call.
    - The moths will respond by calling out “location!”. This represents the sound bouncing of them.
    - The bat will now try to use the source of that sound to find their way to one of the moths. They should continue to call “echo” as they move, and moths should continue to respond so that they may be found.
    - Once the bat finds one of the moths, that round is complete.
7. Reset the game. Play as many more rounds as you like!
    - Switch up the roles each round so that other students have a chance to be the bat.
    - Suggest that bats cup their hands around their ears to mimic a real bat’s ears.
    - Similarly, moths may enjoy flapping their “wings” where they stand.

8. Discuss:
    - How did it feel to be the bat?
        - Was it easier to identify sounds that were closer to you or farther away?
        - Did you notice a difference in sounds when you had bat ears?
        - Was it easier to locate the moths with human ears or bat ears?
        - How do you think a bat's ears help with echolocation?
    - Can you think of any other animals that use echolocation?

Extensions

- Learn about bats found in your area. What type of habitat do they live in? What types of plants or animals do they eat?
- Draw a food chain that includes a bat and a moth. What does the moth eat? Does anything eat the bat?