

# Bat and Moth



**Grade:** 1

**Length:** 5-20 minutes

**Big Ideas:** Adaptations

**Topic:** Predator and prey interactions

## **Summary:**

Students will explore the adaptations bats use to find their prey and the strategies moths use to avoid being captured and eaten using an active game.

## **Standards:**

K-2 Standard 4 – Life Science

*Students will gain an understanding of Life Science through the study of changes in organisms over time and the nature of living things.*

Objective 1: Communicate observations about the similarities and differences between offspring and between populations.

*2. Analyze the individual similarities and differences within and across larger groups.*

Objective 2: Living things change and depend upon their environment to satisfy their basic needs.

*1. Make observations about living things and their environment using the five senses.*

## **Essential Questions:**

- How do an animal's adaptations help them survive?
- How does the environment effect how an animal lives?

## **Enduring Understandings:**

- Adaptations can help an animal find food or avoid being food.
- Animals that are active at night have different adaptations than animals that are active during the day.

## **Objectives:**

- Students will work as a group to model how bats use echolocation.
- Students will be able to describe the different adaptations of a bat.

## **Materials:**

- Blindfold
- Flat area with no tripping hazards

## **Background Information:**

- There are 1,100 species of bats worldwide, making up a quarter of the world's mammals.
- Bats can live more than 30 years and can fly at speeds of up to 60 miles per hour.
- During hibernation, bats can survive in freezing temperatures, even after being encased in ice.
- The world's largest bat is the "flying fox". It has a wingspan of up to 6 feet.
- The world's smallest bat is the bumble bee bat of Thailand, which is smaller than a thumbnail and weighs less than a penny.
- Most bat species are threatened or endangered due to habitat loss and the introduction of a fungus that causes White Nose Syndrome. White Nose Syndrome causes bats to wake up from hibernation too early, when there is not enough food available, and they starve. (Spooky Science: Bat Trivia, The Nature Conservancy, <https://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/arizona/top-10-bat-facts.xml>)
- Luna Moths have evolved tails that confuse bat echolocation. Experiments were conducted with Luna moths with intact wings and with the tails removed. Removing tails did not appear to compromise moth flight performance, but during bat attacks, 35% of intact moths were caught versus 81% for those with clipped tails. (Barber JR, Leavell BC, Keener AL, et al. Moth tails divert bat attack: Evolution of acoustic deflection.)

**Key Vocabulary:**

- Adaptation: Is something that helps an animal live in its environment/home.
- Echolocation: Is when animals use sound and echoes to find the location of objects.
- Predator: An organism that primarily obtains food by the killing and consuming of other organisms.
- Prey: An organism that is hunted or killed by another animal for food.
- Nocturnal: An animal that is active at night.
- Diurnal: An animal that is active during the day.

**Procedure:**

1. Have the students form a circle.
2. Ask the students what they know about bats and how they find their food.

3. Using the Bat Fact Sheet, and the background information, introduce bats and their adaptations.
4. Tell the students they will be trying to catch food the way a bat would.
5. Choose one student to be the bat and another to be the moth, bring them inside the circle.
6. Explain that the bat's goal is to tag the moth, and the moth's goal is to avoid being tagged. The bat will be blindfolded, and must find his/her way by saying "bat", and the student playing the moth will have to respond each time with "moth" just like the game, Marco Polo. The students around the circle will act as trees. Whenever the bat gets close to the trees, they will say "tree".
7. Play multiple rounds, ask the students what strategies they used to catch the moth or avoid being caught by the bat, explain the animals use similar strategies in the wild.

**Additional Notes:**

- Add a new element to the game by having the students around the circle say "tree" whenever the bat says "bat". Ask the students if this makes it more difficult for the bat to catch its prey. What is easier: foraging for food in an open field or in dense woods?
- You can add in more moths for an extra challenge. The bat has to catch them all!
- The student playing the bat can say "bat" as many times as they wish.

## **Bat Fact Sheet**

- Bats have wings! They are the only mammals capable of flight.
- Bats use echolocation to find their food.
- Animals that use echolocation make a sound and then listen for the echo to bounce off of objects around them.
- At night, bats are constantly eating; they can eat over a thousand mosquitoes in an hour!
- Bats are nocturnal; they only come out at night.
- Bats hibernate! They go to sleep all winter.

*Fold along the line!*

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