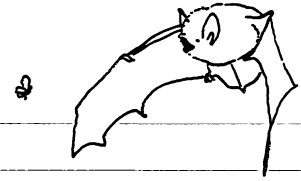


Echolocation

Locating by Echoes



Echolocation is a method of sensory perception by which certain animals orient themselves to their surroundings, detect obstacles, communicate with others, and find food. In echolocation a series of short, high-pitched sounds are emitted by an animal. These sounds travel out away from the animal and then bounce off objects and surfaces in the animal's path creating an echo. The echo returns to the animal, giving it a sense about what is in its path.

Echolocation is used by most microbats. Each species of microbat that uses echolocation has its own unique sound that is produced in the voice box. The frequencies of these sounds extend beyond the range of human hearing. One species of megabat, the Egyptian Fruit Bat, uses tongue clicks to echolocate.

The sounds are emitted in short pulses which are repeated at varying rates. These rates vary from one pulse per second to several hundred per second when a bat is close to a target. By listening to and analyzing the echoes from these pulses, a bat can determine an object's size, shape, direction, distance, and motion. This echolocation system is so accurate that bats can detect insects the size of gnats and objects as fine as a human hair.

Most echolocating bats appear to emit signals through their opened mouths. Knowing this helps to explain why many photographs of bats show them in flight with their mouths open. Other species emit their signals through their nostrils. These bats fly with their mouths closed but usually have elaborate facial characteristics such as nose leaves which help direct the sound pulses.

Scientists would like to know more about how bats use echolocation so they can help blind people detect objects with sound.

