

Echolocation Encyclopedia Article

Echolocation

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Echolocation

Echolocation is a physiological process that some animals use to gain information about their environment. By emitting and detecting its own sounds reflected from objects, animals can avoid obstacles, find food and communicate with others. Echolocation used by many types of bats, some whales and dolphins, as well as other mammals and birds.

The sounds transmitted by animals using echolocation are of a very high frequency, 1,000-200,000 hertz. These sounds are often beyond the audible range of humans, which is 20-20,000 hertz. The sounds of bats and whales can only be heard using high frequency sound detection systems.

The way echolocation works is the animal emits a high-frequency sound and then waits for it to bounce off an object. Some of the sound energy is absorbed by the object, some is transmitted and re-radiated on the other side of the object, and some is reflected or echoed back to the emitter. By interpreting returning echoes, animals can accurately identify the direction, distance, velocity and some aspects of the size of the object in their path. The bat can quickly identify and zero in on a mosquito, as well as avoid trees and other large objects while flying in total darkness. Likewise, a dolphin can detect a school of fish over 100 yd (91 m) away.