

Amazing Echolocation

Echolocation is a technique used by bats, dolphins and other animals to determine the location of objects using reflected sound. Basically, the animal emits a sound and then listens and learns from the sounds echo. Animals that use echolocation have special body parts that help them emit and gather specific information.

Echolocation allows animals to move around, hunt, and thrive in a world of pitch darkness. Animals can navigate, hunt, identify friends and enemies, and avoid obstacles all by utilizing the sound of an echo.

Why did echolocation evolve?

For some animals “seeing” extremely well in darkness gave them an edge. This adaptation may have allowed animals to hunt and live where others could not.

For bats the skill likely developed so they could locate night-flying insects that birds can’t find.

For dolphins and toothed whales, echolocation enables them to see in muddy waters or dark ocean depths and may have evolved so that they can chase and hunt deep-diving species.



How do bats use echolocation?

Bats make high pitched sounds in their larynxes (part of the throat) and emit them through their mouths. They then hear the high-pitched clicking sounds off objects with their specialized ears. Through this method of listening for echoes, the bats learn an amazing amount about their environment.

Fortunately, the sounds the bats emit are too high-pitched for humans to hear – some bats chirps are as loud as a jet engine 90 feet away!

Bats can detect an insect up to 15 feet away, work out its size and hardness, and which way it is moving. They can sense and avoid wires as fine as human hairs. As a bat closes in for the kill, it cranks up its calls to pinpoint the prey.

To avoid being deafened by its own calls, a bat turns off its middle ear just before calling, restoring its hearing a split second later to listen for echoes.



How do dolphins use echolocation?

Just like bats, dolphins and whales use echolocation by bouncing high-pitched clicking sounds off objects, which actually works really well underwater. They make sounds by squeezing air through nasal passages. These soundwaves pass into the forehead, where a big blob of fat focuses them into a beam.

If the echolocating call hits something, the reflected sound is picked up through the animal's lower jaw and passed to its ears. Echolocating sounds are so loud that the ears of dolphins and whales are shielded to protect them. Dolphins and whales use this method to work out an object's distance, direction, speed, and size.

Using echolocation, dolphins can detect an object the size of a golf ball about the length of a football field away – much further than they can see. By moving its head to aim the sound beam at different parts of a fish, a dolphin can even differentiate between species.