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Echolocation©

We humans are lucky enough to be able to run to the grocery store when we need food, but how do animals feed themselves? Animals like bats and dolphins have limited sight capabilities, so they use sound to find their next meal! Let's learn about **echolocation**!

Supplies:

- Handheld mirror
- Flashlight

Instructions:

For this experiment, you will need a minimum of 3 people. One person will be our dolphin looking for dinner (flashlight); one person will be the ocean wall (mirror); and one person will be dinner!

1. Shine your flashlight in the direction of the mirror
2. When the light hits the mirror, angle the mirror so that the light reflects onto your "dinner".
3. Once you have successfully caught your, "dinner", everyone rotate & change roles.
 - dolphin becomes ocean wall
 - ocean wall becomes dinner
 - dinner becomes dolphin
4. Repeat the activity until everyone has had a chance to play each role.

The Science Behind It:

The ocean is the largest habitat for life on earth! How many types or kinds of oceans does the earth have? Five: Pacific, Atlantic, Indian, Arctic and the Southern. Oceanography is the study of the oceans.

How about a scientist who studies marine animals? They are called Marine biologists. Marine biology is the study of animal and plant life in saltwater ecosystems. What kinds of animals live in the ocean? What kinds of mammals live in the ocean? How about a whale or dolphin? (A dolphin is a type of whale.) Scientists put these animals in a special group called CETACEA (sey-tay-sha).

How do dolphins find food? By using **Echolocation**. Echolocation is still being studied further today and there is much that scientists still do not understand. What they have discovered is that the sound is a unique tool for hunting and for communication. Think of it as an ability to never have to use your eyesight, but still know what was in front of you.

Dolphins ability to echolocate, or determine the location of objects by their echoes, is a highly specialized faculty that enables dolphins to explore their environment and search out their prey in a watery world where sight is often of little use.



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REAL WORLD RELEVANCE

As sound travels four and a half times faster in water than in air, the dolphin's brain must be extremely well adapted in order to make a rapid analysis of the complicated information provided by the echoes. Sometimes scientists will call it sonar. Dolphins send out a series of clicking sounds. All of these clicks and whistles are created by squeezing a tiny jet of air under high pressure between small sacs just below the blowhole out of the top of the "head". As soon as an echo is received, the dolphin generates another click. The time lapse between click and echo enables the dolphin to evaluate the distance between it and the object; the varying strength of the signal as it is received on the two sides of the dolphin's head enable it to evaluate direction. By continuously emitting clicks and receiving echoes in this way, the dolphin can track objects and zoom in on them.

The dolphin "head" is called the melon. The melon is a large lens shaped organ made of fatty tissue. The melon focuses the sound so that they are emitted in a narrow beam. The sound bounces off the object and returns to the dolphin like an echo. The sound travels very fast in the water. When the sounds hit a fish or some coral they bounce back as an echo. Not only that, but they can create an acoustical picture of their environment. They can even tell the difference between different species of fish, talk about picking out your dinner!