



Introduction to Sonar & Sound

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Date:

Objective:

To get the student thinking about the "who, what and where" of Sonar and what Sonar actually is.

Vocabulary Words:

Sonar - Sounding Navigation And Ranging - A device, or an organ in animals, that uses sound in water to detect objects. Sonar has two modes of operation: Active and Passive modes that will be discussed later.

Materials:

Background Information:

We've all heard the word Sonar used to describe how animals "hear" and "locate" each other, avoid obstacles and find food. But, have you ever wondered exactly what Sonar is?

In the following lessons and activities I hope to explain what Sonar is, how animals and the US Navy use Sonar and perhaps give you a desire to learn more on your own.

Think about the last time you heard the word Sonar, was it in reference to porpoises? Bats? Where else? Have you ever wondered what Sonar is? Let's try to answer that question.

Sonar, as defined in the vocabulary section above is short for Sounding Navigation And Ranging. Simply put, it's a method, device or organ that emits Sound and listens for an echo to

determine where and how far an object is. Once an echo is received, it's just a matter of determining the direction the object is and how far away it is (Range) so you can Navigate better to avoid or intercept the object. I should note that there is another version of Sonar that only listens for noise. In this case no sound is generated by the source (device or organ) and the sound source (object) can only be located by direction, distance (Range) can not be determined.

Now you may ask yourself "how does sound travel in water"? I've been swimming and only hear muffled sounds when underwater. Well, specialized equipment is needed to decipher what all those muffled sounds mean. Water just happens to be a very good conductor of sound - water conducts sounds almost as well as your telephone but the specialized equipment (Sonar) is needed to translate that sound.

Activity Instructions:

Conclusion/wrap up:

There are 2 lessons that follow:

Acoustic Properties General - An introduction to sound and how water conducts sound.

Acoustic Properties Advanced - A more in-depth discussion of what effects salinity, temperature and depth have on sound transmission.

There are also 5 activities available for you to experiment with sound:

Activity 1 - Listen to sounds travel underwater

Activity 2 - See the sound

Activity 3 - Experimenting with sound waves

Activity 4 - Echo location (active Sonar)

Activity 5 - Echo location (passive Sonar)

Further Investigations:

Sources: