**Echolocation and SONAR[[1]](#footnote-1)**

Adams, W.K.

Students explore the speed of sound by experiencing the delay for sound to reach them when they know a noise has been made. They will explore what it feels like to find objects without sight.

|  |  |  |
| --- | --- | --- |
| **Science Topics** | **Process Skills** | **Grade Level** |
| Echoes | Observing | 1-2 |
| Echolocation | Predicting |  |
| Speed of sound | Scientific Inquiry |  |
|  | Comparing |  |
|  | Classifying |  |
|  | Communicating |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Time Required** | | | |
| **Preparation** | **Set-Up** | **Activity** | **Clean-Up** |
| None | None | 30 minutes | 10 minutes |

|  |
| --- |
| **Learning Goals** |
| **Students will be able to…** |
| * describe the limits of the size and distance that dolphins and bats can echolocate |
| * describe the limits of the size and distance that humans can locate visually |

|  |  |  |
| --- | --- | --- |
| **Materials** | | |
| **In the Kit** | **Not in the kit** | **Optional** |
|  | At least 8 people |  |
|  | A large open space |  |
|  | Your imagination! |  |

|  |
| --- |
| **Introduce the Activity** |
| Explain that the class will be going outside and be sure to identify any safety concerns that may exist. |

|  |
| --- |
| **Doing the Activity** |
| **Fish Finding Game** |
| 1. Groups of 8-10 students will work together for this activity. One student will be a dolphin, 3 will be fish, and the rest will be objects  * The dolphin **must** keep their eyes closed the whole time. * Objects are to lay, sit or stand in one place. * Fish move around **slowly**, winding in and out of objects. |
| 1. The dolphin tries to locate fish while avoiding objects    * The dolphin makes a sound, “beep,” and any object or fish in front of the dolphin is required to respond.   Objects will say, “object”  Fish will say, “fish”   * + When a Fish is tagged, that fish becomes a dolphin, and the dolphin becomes a fish.   **NOTE:** If the dolphin is having trouble locating fish, or if the fish are misbehaving, have the fish move one step per beep or have them stand still. |
| 1. Discuss the following questions with the students: 2. What can the dolphin do to make their job of fish finding easier? 3. Does it help if they beep more often? |

|  |
| --- |
| **Explanation** |
| In-depth background information for teachers and interested students. |
|  |
| Key Lesson Terminology |
| * Echoes – reflections or repetitions of sound waves. Echoes can be produced and heard by clapping hands or shouting in a large empty room with hard walls or in a cave for example. |
| * Echolocation – a method used to detect objects by producing a specific sound and listening for its echo. |
| * Speed of Sound – the speed at which sound travels. This is very important for scientist who study sound. In air, sound travels 343 meters in 1 second (767 miles per hour), but in water sound travels 1500 meters in 1 second (3350 miles per hour). Compare these speeds to cars traveling on the highway at 65 miles per hour. |
| * SONAR – Sound Navigation And Ranging, is the process of listening to specific sounds to determine where objects are located. |

1. This activity can stand-alone or be done with other echolocation activities. We do it on the same day as the Speed of Sound activity. [↑](#footnote-ref-1)