3.7 Read

How Do Dolphins Communicate?

Sometimes, when people cannot see each other but know that someone is close enough to hear, they use their voices. The sound of a human, or an elephant, travels well through the air. When marine mammals communicate, the sounds they make must be able to travel well through the water. Marine mammals have developed many different ways to communicate in a water environment.

How Do Dolphins Use Sound to Communicate?

To survive, dolphins must be able to keep in touch with other members of their pod, identify and avoid obstacles and predators in the ocean, and find food. Their environment requires that they communicate in ways other than just visual communication. The ocean can be dark and murky, and finding food, ocean hazards, or other dolphins through sight alone is not always possible.

Dolphins must be able to communicate in dark, murky areas of the ocean.
Dolphins use clicks, whistles, squeaks, and trills to communicate. These kinds of sounds travel well through water. One specific type of click is called a “sonar click.” (Sonar stands for “SOnund NAviGation and Ranging.” You will read more about sonar later in this section.) Sonar clicks allow dolphins to communicate with echolocation. Echolocation works just like an echo. When a dolphin makes a sound in the water, the sound waves move through the water and hit an object. The sound waves then bounce off the object and travel back to the dolphin. The dolphin hears the returning sound wave. The time it takes for the sound wave to travel out and come back gives the dolphin information about the size, shape, speed, distance, and direction of objects in the water. Echolocation is very accurate. Dolphins are so good at using echolocation that they can even use it to tell the difference between types of fish.

In water, the molecules are closer than they are in air, therefore sound travels almost five times faster in water than it does in air. This helps dolphins receive information more quickly than if they were sending the sounds through the air.

Marine mammals have excellent hearing. The ocean is a noisy place. Many creatures make sounds. People have also added many sounds to the ocean. Dolphins can distinguish those sounds from one another. They can hear the echoes of their own clicks, and they can hear the clicks of other dolphins. They can use the clicks of other dolphins to find them. By using their excellent hearing, dolphins can find food, avoid obstacles, find other dolphins, and avoid some dangers.

Dolphins use sound in other ways, too. Each individual dolphin has its own “signature whistle.” A mother dolphin will repeat this signature whistle over and over to her newborn. The calf becomes able to identify its mother’s special sound. When a dolphin mother is separated from her calf, she whistles her sound. Because the calf can recognize the sound, it knows where to find its mother.
What Are Some Other Ways Dolphins Communicate?

Dolphins are mammals and must breathe air to survive. To get air, they must return to the water surface. In the brighter ocean near the surface, dolphins often use sight and touch, as well as sound, to communicate with one another. Dolphins can be seen leaping high into the air. They also slap their flippers or tails on the surface of the water. Using this body language, dolphins can alert others to danger and possible food sources, or can tell others they want to play.

Stop and Think

1. What are some ways dolphins communicate with one another?
2. People communicate about a variety of things. What do you think are some things dolphins communicate about?
3. How does a dolphin’s environment affect how it communicates?

Humans also Use Echolocation

Echolocation is a very important tool for marine mammals and some other mammals, such as bats. Scientists also use echolocation, called sonar. Oceanographers are scientists who study the ocean.
Because parts of the ocean are very deep and dark, these scientists cannot explore it themselves. However, they can make accurate images of what the ocean floor looks like using sonar. This allows them to study underwater mountains and ridges. Sonar use also allows oceanographers to find sunken ships.

As mentioned, sonar stands for “SOund NAvigation and Ranging.” Scientists send out sound waves from the water and measure the time it takes for each one to return. Each measurement is recorded. When the measurements are put together, they create an image of what is on the ocean floor. Sonar has expanded scientists’ ability to see where they have never seen before.

Sonar can also be used by ships to see other ships, find obstacles in the water, and even find fish. Since World War I, in 1915, nations have used sonar on naval ships to find and intercept enemy vessels. Unfortunately, these uses of sonar have been linked to deaths of marine mammals around the world.

Although scientists do not understand why, it is clear that some types of sonar used by these ships interfere with the echolocation of marine mammals. Scientists have found several cases of whales having beached themselves after having been exposed to the sonar of ships.

**beached** (beaching, to beach): when a marine mammal that cannot live out of the water strands itself on land, usually a beach.
Revise Your Explanation

You have just read more about how dolphins communicate and what scientists know about dolphin communication. With your group, look back at your Observing and Interpreting Animal Behavior pages. Look at your original interpretations of dolphin communication. Now, with your new science knowledge, reinterpret the behavior you saw in the video.

Go back to your explanation on your Create Your Explanation page. First, add the science you just learned to the science knowledge box. Then, check to make sure your claim is still accurate. If your claim does not match the science you have read, revise it. Next, support your claim with your new science knowledge.

Rewrite your explanation to make it more complete. Include in your explanation how the dolphin’s body structure and environment influence its communication. The dolphin’s environment includes the dark area under water as well as the sunlit area on the surface of the water. Be sure to include both of these areas in your explanation. Remember that an explanation is a statement that connects a claim to evidence and science knowledge in a logical way. Write your explanation so that it tells why your claim is accurate. Be sure your explanation matches the science you just read. Make sure your claim now matches what you have learned. If it does not, revise your explanation. Use the information from your reading about dolphin communication to support your revised explanation. You might need to write an explanation that has a few sentences rather than just one long sentence. The goal is to tie everything together and help others understand why your claim is true.

Communicate

Share Your Explanation

Share your new explanation with the class. When you share your explanation, tell the class what makes this revised explanation more accurate than your earlier one. As each group shares their explanation, pay special attention to how the other groups have supported their claims with science knowledge. Ask questions or make suggestions if you think a group’s claim is not as accurate as it could be or if the group has not supported their claim well enough with observations and science knowledge.

As a class, work together to develop your best explanation of what affects how dolphins communicate.
Update the *Project Board*

As you read more about how dolphins communicate, you may have thought of new questions you want to ask. Add what you learned from your reading to the *Project Board*. Make sure you add evidence to support any new science you learned. Also, think about how this learning will help you answer the Big Question, *How do scientists answer big questions and solve big problems?* As your teacher records this information on the big *Project Board*, add the information to your own *Project Board* page.

**What’s the Point?**

Echolocation and sonar both rely on sound waves being sent out, bounced off objects, and returned. The way the sound comes back helps determine the shape and location of an object. Dolphins use echolocation. Sets of sonar clicks make it possible for a dolphin to find food, other dolphins, and hazards in the water. Echolocation is very important for dolphins because ocean water can be murky and dark. Other forms of communication are not as effective in that environment.

Sonar is also a tool used by scientists to “see” into the deep and dark parts of the ocean. Sonar uses sound waves to create an image of the ocean floor, fish, and objects in the ocean, such as sunken ships. Naval vessels use sonar to find and intercept other ships. Scientists think there are times when the sonar from these ships interferes with the echolocation of marine mammals.

*This dolphin is using echolocation to identify an object inside a box.*