

## Using Speed to Estimate Distance and Time

The speed of sound in air is about 330 m/s. Sound travels faster in water than it does in the air. The speed of sound in water is about 1,500 m/s.

Sonar is used in water to both detect and estimate the distances to objects. For example, a submarine can use its sonar units to pick up the sounds of another vessel's engine and propellers and then estimate the distance to that vessel.

Use the information to answer these questions. Circle your answers.

1. A car is 1,500 m away from you. The driver blows the horn. How long does it take the sound to reach your ears?  
A. about 1 second                      C. about 4.5 seconds  
B. about 3 seconds                      D. about 6 seconds
2. A submarine's sonar unit sends out a signal that bounces off another vessel and returns to the submarine in a round-trip time of 4 seconds. How far is the other vessel from the submarine?  
A. about 1,500 m                      C. about 4,500 m  
B. about 3,000 m                      D. about 6,000 m
3. A submarine sends a sonar signal to another submarine that is 8,000 m away. What is the time span between the sending of the signal and its return to the sonar unit?  
A. about 2.7 seconds                      C. about 10.7 seconds  
B. about 5.3 seconds                      D. about 21.3 seconds



**Notes for Home:** Your child learned about estimating time and distance using speed.

**Home Activity:** With your child, research dolphins' sonar systems. Then together write and solve problems involving dolphins and their sonar.