

## Problem Solving Activity: IN SEARCH OF BURIED TREASURE

**BACKGROUND:** The Sea Queen, a research ship, has dropped anchor in an area where treasure is believed to have been lost on the ocean floor. Here, however, the ocean floor is too deep for divers to explore. So instead, the scientists onboard send out a series of sound waves at different locations around the ship. Sound waves travel at 1.5 km/sec (1500 m/sec) in ocean water. When a sound wave reaches the ocean floor, it bounces back to the ship, where it is recorded. Each sound wave travels the same distance on the way up from the ocean floor as it does on the way down.

After a long day, the researchers have gathered many pages of data describing the sound waves. Now it is time to call in an expert to interpret the data.

**TASK:** As the expert in acoustics, it is your job to figure out the depth of the ocean at each point in the area surrounding the ship.

- Decide what other measurement you will need to accomplish your task.

On board the ship is a map of the ocean floor. The map is made on the basis of the measurements taken before the treasure was lost.

- How can you use the map to find the treasure?
- Do you think you will be able to find the lost treasure?

**NOTE:** Formula:  $\text{Distance} / \text{Time} = \text{Speed}$

