



Sound Energy and Waves

1. Circle **T** if the statement is TRUE or **F** if it is FALSE.

- T F a) Sound carries air from the source of sound to our ears.
- T F b) Sound is caused by vibrating objects.
- T F c) Sound can travel across empty space.
- T F d) High pitch means a sound is loud.
- T F e) Sounds are carried by waves.
- T F f) Waves move water across the ocean.

2. Use the words in the list to answer each question. Use a dictionary to help you.

- | | | |
|-----------|-----------|------------|
| amplitude | frequency | wavelength |
| medium | density | source |
- a) Which is short when frequency is high?
 - b) What tells how loud a sound is?
 - c) Sound waves are areas of high and low
 - d) High pitched sounds have a high
 - e) What do we call the place where a sound begins?
 - f) What do we call the material that sound travels through?

Sound Energy and Waves

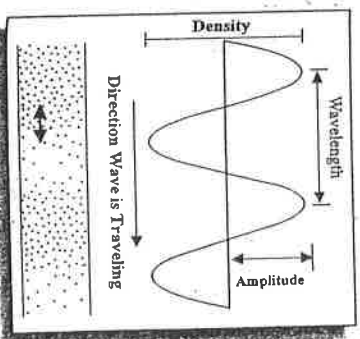
Some kinds of energy are moved, or transferred, by waves. Waves traveling across water transfer energy. This wave energy is what moves surfers toward the shore. The energy in ocean storm waves can cause a lot of damage.

It is important to understand that the energy moves, and the wave shape moves, but the water does not move along with the wave. The water moves in up-and-down circles, but it is not transferred with the wave. Think about the little waves that move away from a pebble dropped into a pond. If those waves were moving the water away from the center, a hole would appear where the pebble sank.

The material that a wave moves through is called its **medium**. All kinds of waves transfer energy, but the medium is never transferred with the wave.

Not all waves look wavy. **Sound** travels in waves through the air and other materials, but we cannot see them. Sound waves are areas of **high density** and **low density** air traveling away from the **source** of the sound. To picture sound waves, think of bands of thicker and thinner air.

If we could see air particles when a sound wave passes, they would look like the dots in the picture. Air particles move back and forth in the direction the wave is moving, but they do not move with the wave.



The graph below the picture shows how air density changes as a sound wave passes. Notice that the graph does look like a wave. The picture also shows some words that tell a lot about a wave. The **amplitude** is the height of the wave measured from the middle to the top. The **wavelength** is the distance between the tops of two waves. The **frequency** of a wave tells how often (frequently) a wave passes. Frequency is given in waves per second. Waves with short wavelengths have high frequencies. Waves with long wavelengths have low frequencies.

