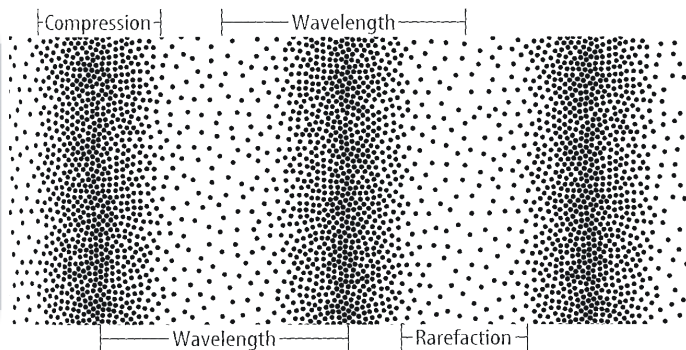
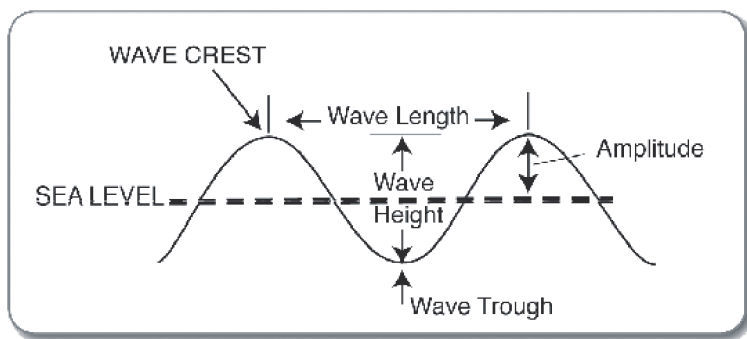
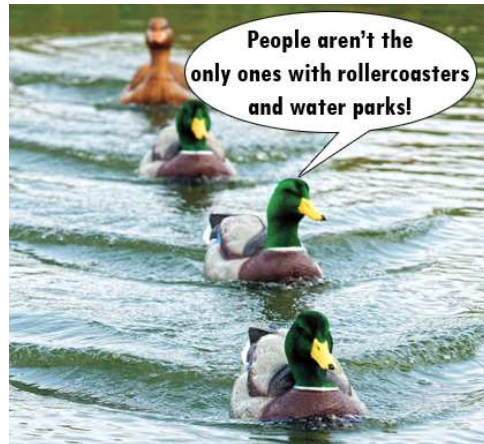


Waves

You've seen waves at the ocean, but there are also sound waves, radio waves, and light waves. What do all these waves have in common? A wave is a rhythmic disturbance that carries energy without carrying matter. The ripples in a pond are waves. A rock is thrown in a pond. Concentric rings move across the pond, but the water is not moving across the pond. The molecules in the water collide with each other and transfer energy which moves across the pond, leaving the water molecules in place. There are two main types of waves, mechanical waves and electromagnetic waves.

Mechanical waves are waves that use matter, or a medium, to transfer energy. The waves on the ocean or ripples in a pond and sound waves are both mechanical waves, but they are very different. Water waves are transverse waves. Transverse waves cause the medium to move at right angles to the direction the wave is traveling. For example a ripple caused by a stone tossed in a pond spreads across the pond (the direction of the wave), but the water moves up and down (the direction of the medium). The high points are called crests, and the low points are called troughs. Sound waves are longitudinal or compressional waves. In longitudinal waves, the medium moves back and forth in the same direction that the wave passes. A sound wave causes the particles in the medium to be alternately pushed together (compression) and spread apart (rarefaction). The series of compressions and rarefactions moving through a medium is a sound wave.



Electromagnetic waves can travel through space where no matter is present. These include radio waves, infrared, visible light, ultraviolet, X-rays, and gamma rays. Sunlight is a major source of electromagnetic waves on Earth. Ninety two percent of the radiant energy that reaches the earth from the sun is infrared and visible light. Infrared makes you warm. Visible light enables you to see. Some of the radiant energy from the sun is ultraviolet. It causes tanning and sunburn.

Answer the questions below based on your reading above, and on your knowledge of physics.

1. What is a wave? _____

2. What are the two main types of waves? How are they different? _____

3. How do transverse and longitudinal waves compare? _____

4. You pluck a guitar string. How does it make a sound? What type of wave is it? _____

5. How is light different from sound or water waves? _____

6. An advertisement for a sci-fi horror movie says, "In space, no one can hear you scream!" What does this mean? _____

7. What type of wave is pictured below. Label *a-e* on the diagram.

