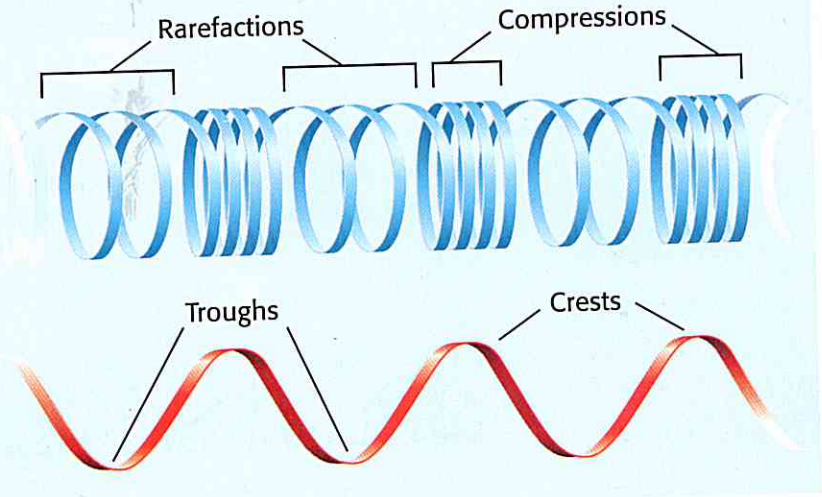
Figure 6 Comparing Longitudinal and Transverse Waves

Pushing a spring back and forth creates a longitudinal wave, much the same way that shaking a rope up and down creates a transverse wave.



longitudinal wave a wave in which the particles of the medium vibrate parallel to the direction of wave motion

Longitudinal Waves

In a **longitudinal wave,** the particles of the medium vibrate back and forth along the path that the wave moves. You can make a longitudinal wave on a spring. When you push on the end of the spring, the coils of the spring crowd together. A part of a longitudinal wave where the particles are crowded together is called a *compression*. When you pull back on the end of the spring, the coils are pulled apart. A part where the particles are spread apart is a *rarefaction* (RER uh FAK shuhn). Compressions and rarefactions are like the crests and troughs of a transverse wave, as shown in **Figure 6.**

Sound Waves

A sound wave is an example of a longitudinal wave. Sound waves travel by compressions and rarefactions of air particles. **Figure 7** shows how a vibrating drum forms compressions and rarefactions in the air around it.

Reading Check **What kind of wave is a sound wave?**

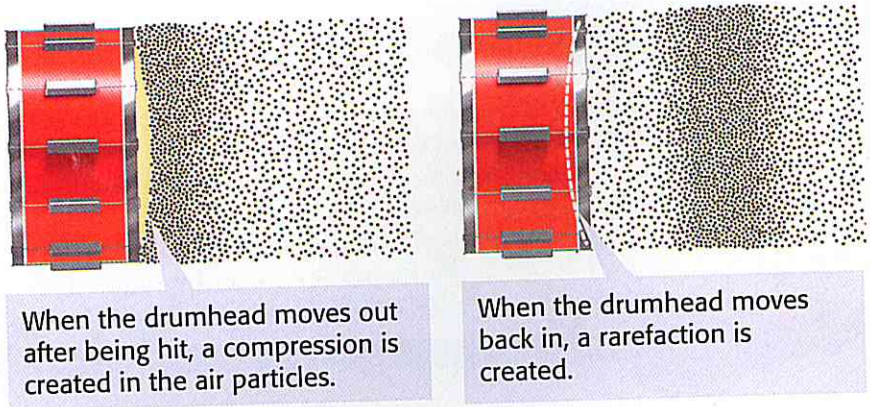


Figure 7 *Sound energy is carried away from a drum by a longitudinal wave through the air.*