Surface Waves

As their name implies, surface waves are earthquake waves that travel along Earth's surface. When P waves and S waves reach Earth's surface, they produce surface waves. The two types of surface waves are Love waves and Rayleigh waves.

Love waves cause particles of material to move from side to side, in a direction perpendicular to the waves' direction of travel. Rayleigh waves travel more slowly than Love waves and cause particles of material to move in elliptical patterns. The Rayleigh wave pattern is similar to the movement of particles in the ripples that appear on the surface of a lake into which a pebble has been tossed.

Even though surface waves travel more slowly than either P waves or S waves, they are often perceptible far from the epicenter of the earthquake and can cause considerable damage.

10.1 Section Review

1. Explain where earthquakes are most likely to originate and why they originate in these places.
2. Describe the difference between the focus of an earthquake and the epicenter of an earthquake.
3. Draw and label a diagram illustrating two types of surface waves.
4. CRITICAL THINKING Compare and contrast body waves and surface waves. Explain how the depth of an earthquake's focus might determine the extent of the damage it causes.
5. MATHEMATICS Suppose an earthquake's P waves travel at an average speed of 6 kilometers per second, and its S waves travel at an average speed of 3.4 kilometers per second. How long will it take the P waves to reach a recording station that is 60 kilometers from the focus? How long after the P waves will the S waves reach the same station?