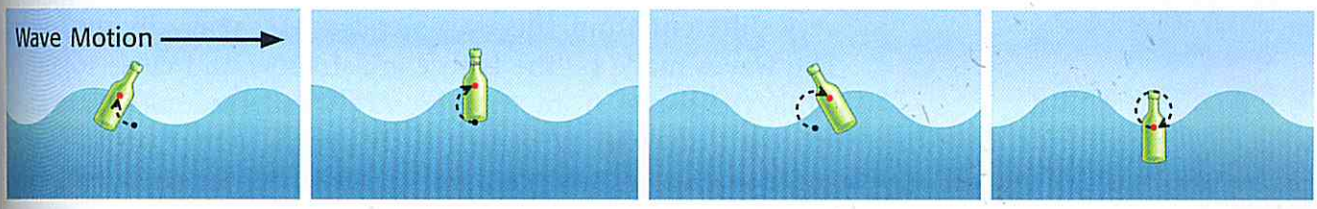
Combinations of Waves

When waves form at or near the boundary between two media, a transverse wave and a longitudinal wave can combine to form a *surface wave*. An example is shown in **Figure 8.** Surface waves look like transverse waves, but the particles of the medium in a surface wave move in circles rather than up and down. The particles move forward at the crest of each wave and move backward at the trough.

Figure 8 *Ocean waves are surface waves. A floating bottle shows the circular motion of particles in a surface wave.*



SECTION Review

Summary

- A wave is a disturbance that transmits energy.
- The particles of a medium do not travel with the wave.
- Mechanical waves require a medium, but electromagnetic waves do not.
- Particles in a transverse wave vibrate perpendicularly to the direction the wave travels.
- Particles in a longitudinal wave vibrate parallel to the direction that the wave travels.

Using Key Terms

Complete each of the following sentences by choosing the correct term from the word bank.

transverse wave — wave
longitudinal wave — medium

1. In a ___, the particles vibrate parallel to the direction that the wave travels.
2. Mechanical waves require a ___ through which to travel.
3. Any ___ transmits energy through vibrations.
4. In a ___, the particles vibrate perpendicularly to the direction that the wave travels.

Understanding Key Ideas

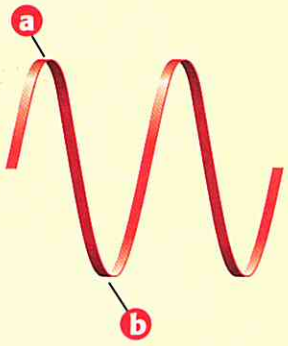
5. Waves transfer
   - **a.** matter.
   - **b.** energy.
   - **c.** particles.
   - **d.** water.
6. Name a kind of wave that does not require a medium.

Critical Thinking

7. **Applying Concepts** Sometimes, people at a sports event do "the wave." Is this a real example of a wave? Why or why not?
8. **Making Inferences** Why can supernova explosions in space be seen but not heard on Earth?

Interpreting Graphics

9. Look at the figure below. Which part of the wave is the crest? Which part of the wave is the trough?



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