

Properties of Waves

Textbook pages 134–143

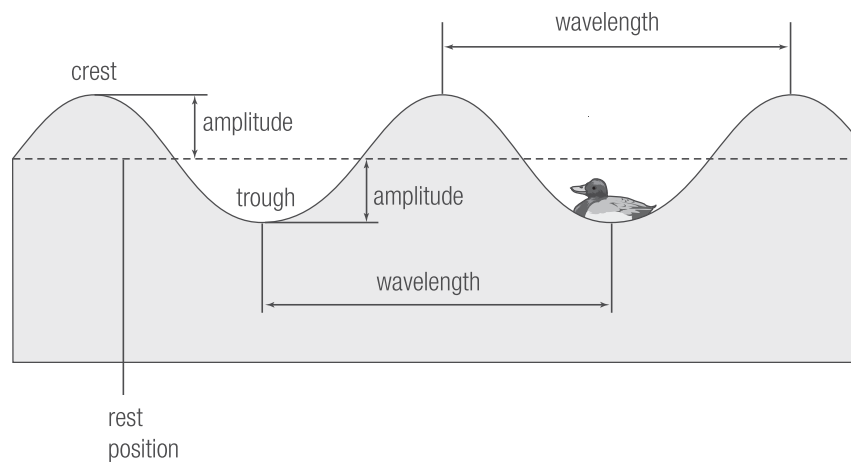
Before You Read

In this section, you will find out about waves, such as water waves, sound waves, and radio waves. On the lines below, list devices you use that make or use waves.

Mark the Text

Identify Details

As you skim the section, use one colour to highlight the text that talks about parts of a wave. Use another colour to highlight other facts about waves.



What are the features of a wave?

A **wave** is a movement that transfers energy through matter or space. Energy is the ability to apply a push or pull on an object. For example, a water wave moves energy through water. A sound wave moves energy through air. A radio wave can move energy through space.

Because you can see water waves, it is helpful to use a water wave to describe waves in general. You cannot see many other kinds of waves, such as sound waves.

A water wave does not carry water along with it. Only the energy carried by the water wave moves forward. A duck moves up and down as a wave passes — it does not move forward.

There are different features of waves that help you describe them. You can see these features labelled on the diagram above. The dotted line represents the rest position of the wave. This is also called the equilibrium position. For a water wave, the rest position of the wave is where the water would be if it were still. ✓

Reading Check

1. What is the rest position of a water wave?

The features of a wave are listed below.

- ◆ **crest:** the highest point of a wave
- ◆ **trough:** the lowest point of a wave
- ◆ **wavelength:** the distance from one point on a wave to the same point on the next wave, such as from crest to crest or from trough to trough. A wave with a long wavelength carries less energy than a wave with a short wavelength.
- ◆ **amplitude:** the height of a wave crest from its rest position. Amplitude is also the depth of a wave trough, as measured from its rest position. A wave with a large amplitude carries more energy than a wave with a small amplitude.

How many times does a wave repeat in a period of time?

Another important way to describe a wave is by its frequency. You may have already heard the term frequency used to describe radio stations or music. The **frequency** of a wave is the number of times it repeats in a given period of time. A repetition of a wave is also called an oscillation or vibration. One vibration occurs over one wavelength.

Frequency is measured in hertz. **Hertz (Hz)** means cycles per second.

When the wavelength is short, the frequency is high. When the wavelength is long, the frequency is low. ✓

What are the different types of waves?

You have read that sound travels by sound waves. Sound can travel through air, water, and even solid walls. The matter a wave travels through is called a **medium**. The medium can be a solid, liquid, or gas. For example, the medium of a water wave is water.

Not all waves need a medium. For example, visible light waves and radio waves can travel through space where there is no matter.

Reading Check

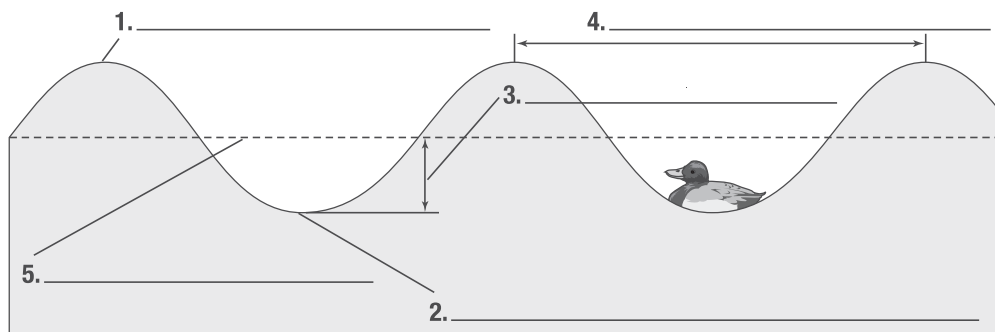
2. How is the frequency of a wave measured?

Use with textbook pages 134–136.

Features of a wave

Use the vocabulary words in the box below to label the parts of a wave.

Vocabulary	
amplitude	wavelength
crest	rest position
trough	



On the line beside each term, describe the wave feature.

6. amplitude _____

7. crest _____

8. trough _____

9. wavelength _____

10. rest position _____
