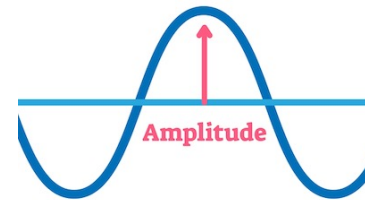


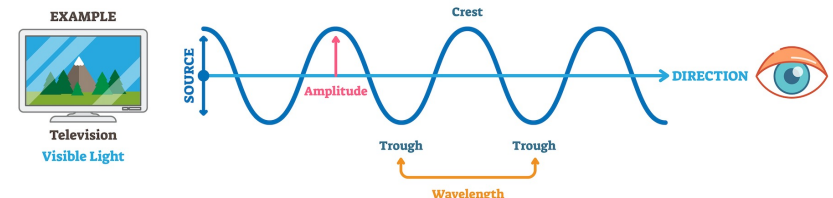
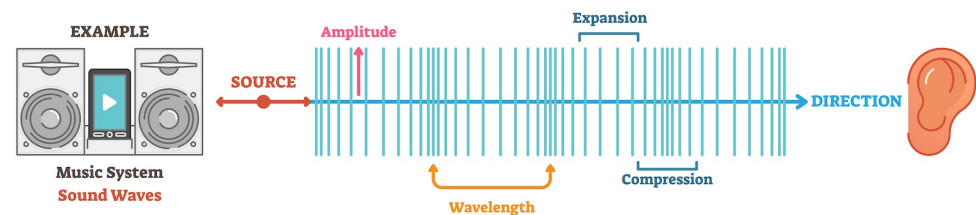
Waves Introduction

- What Waves Are
- Types of Waves
- Transverse vs. Longitudinal Waves
- Frequency, Hertz, Period
- Amplitude
- Crests, Troughs, and Wavelength
- Universal Wave Equation



$$f = \frac{1}{T} \quad T = \frac{1}{f}$$

$$v = f\lambda$$



Preview File

Please enjoy this preview of your Student Version of the presentation. Please note within this sample file:

- Some slides appear blank because they have been removed
- Student versions have portions of the text removed which is given in the teacher version and appear as _____ which the students are to fill in
- Other slides may have on them, this represents writing that has been removed on this sample

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Waves

- _____
- They all originate from vibrations
 - i.e. dropping a pebble into water
- Examples:
 - Water waves
 - Waves in a string
 - Earthquake waves



Waves

- _____
- This vibration can be caused by many things from moving a string, rubbing objects together or having an object impact the ground or water
- i.e. seismic waves



Waves

- _____
- Example: Water waves created from tectonic activity, volcanic eruptions, winds, impacts, etc. carry a lot of energy which can be used to inflict serious damage



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Waves

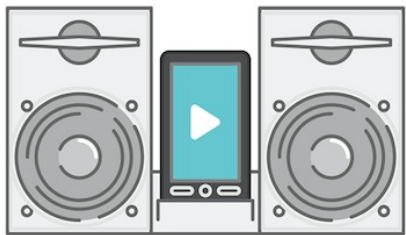
We will be discussing two main types of waves

1) Transverse Waves

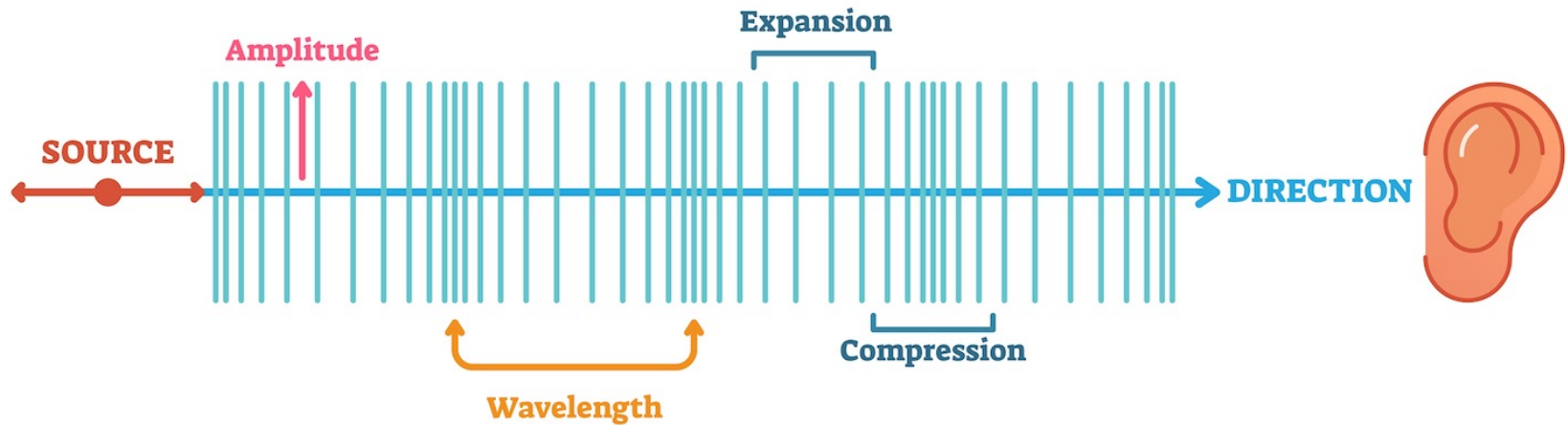
2) Longitudinal Waves

Longitudinal Waves

EXAMPLE



Music System
Sound Waves

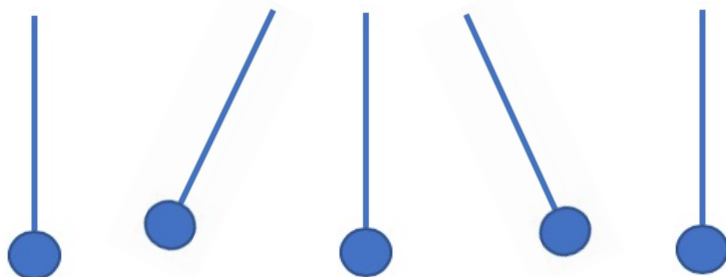


Terminology

Regarding any kind of vibrating object:

- One
- The number of cycles per second is the frequency (f)
 - The unit for frequency is the hertz (Hz)
- ---

 - The unit is usually the second but can be days, months, years, etc.



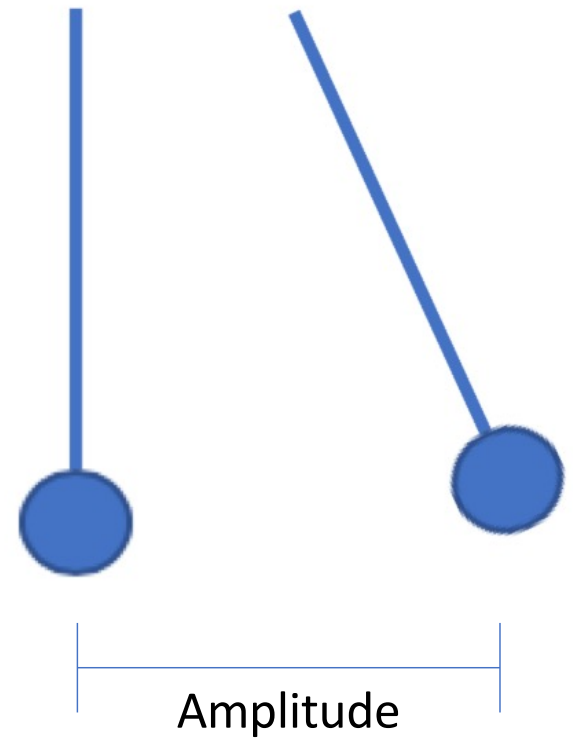
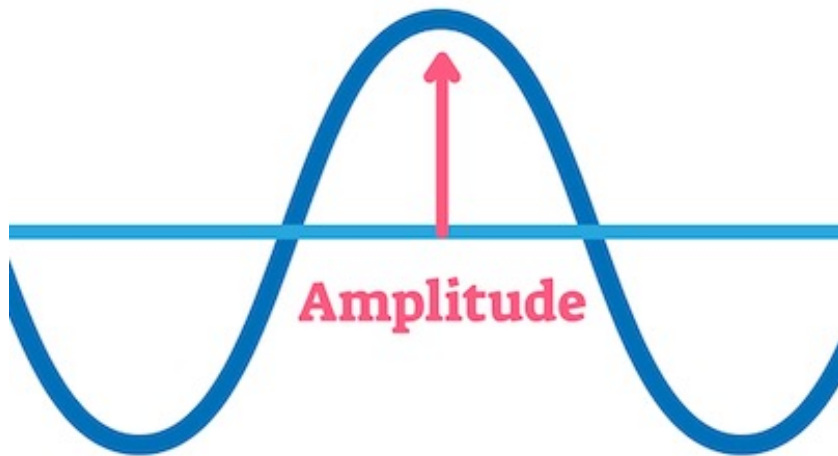
← One complete cycle

Frequency and Period

They are reciprocals of each other
therefore,

$$f = \frac{1}{T} \quad T = \frac{1}{f}$$

Amplitude



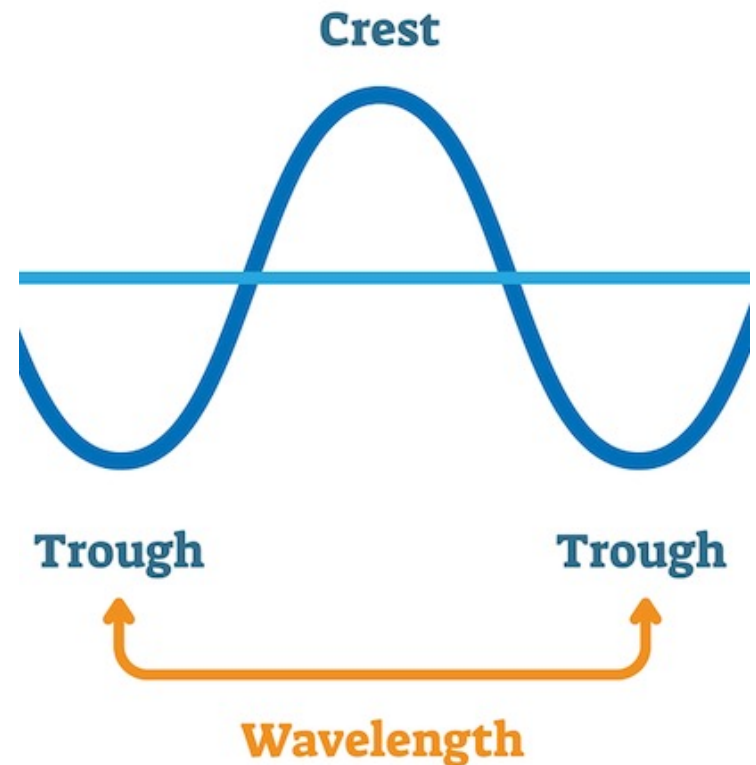
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Check Your Understanding

The amplitude of a child swinging on a swing is 1.2 m. What total distance does she travel after 3 complete cycles?

A Few More Terms

- Crests - High section of the wave
- Troughs - Low section of the wave
- Wavelength (in m) -



Universal Wave Equation

- Recall: $v = \frac{d}{t}$
- Regarding waves, the distance travelled is the wavelength (λ in m) and the time is the period (T) which is the time to complete a wavelength in s therefore,

$$v = \frac{\lambda}{T} \quad \text{since } f = \frac{1}{T} \quad v = f\lambda$$

- The wave equation works for all waves, visible and invisible

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Check Your Understanding

The distance between successive crests in a series of water waves is 4.0 m and the crests travel 9.0 m in 4.5 s. What is the frequency of the waves?

Check Your Understanding

The period of a sound wave from a piano is 1.18×10^{-3} s. If the speed of the wave in the air is 3.4×10^2 m/s, what is its wavelength?