



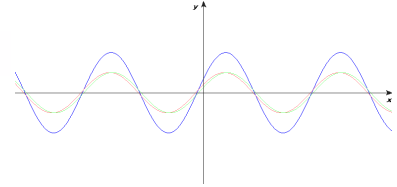
PRACTICE	LABS	TESTS
	<ul style="list-style-type: none"> Rube Goldberg Labs Exploring Waves Interactive (RsVCP) 	Unit 14 Test Thursday (5/9/19)

Waves



14.1

I can define, analyze, and solve problems involving the properties of waves.



Examples of Waves



Crowd
Ocean
Hand
Sound
Heat

Light
Gamma
Radio
Infrared
Micro
UV

WHAT IS A WAVE?

- a **disturbance**
- created by a **source**
- travels through a **medium**

A ripple forms when raindrops hit the pond.
What is the source?
What is the medium?

Types of Waves

An **electromagnetic wave** is a wave that is capable of transmitting its energy through a vacuum (i.e., empty space).

Examples:

Mechanical waves require a medium in order to transport their energy from one location to another.

Examples:

Types of Waves

An **electromagnetic wave** is a wave that is capable of transmitting its energy through a vacuum (i.e., empty space).

Examples: Light, radio waves, microwaves

Mechanical waves require a medium in order to transport their energy from one location to another.

Examples: Sound wave, water waves, seismic waves

Mechanical Waves

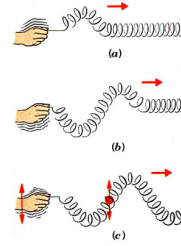
Transverse Waves vibrate perpendicular to the direction of the wave's motion.

Longitudinal Waves vibrate in the same direction, or parallel, to the direction of the wave's motion.

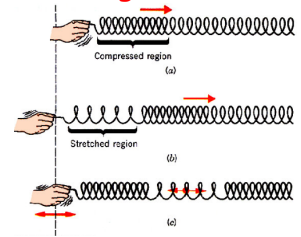
Surface Waves have characteristics of both transverse and longitudinal waves.

Visualizing Waves

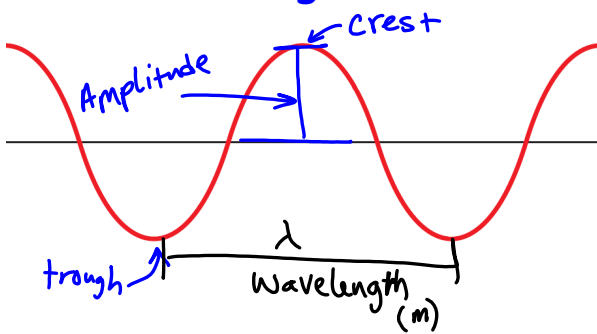
Transverse



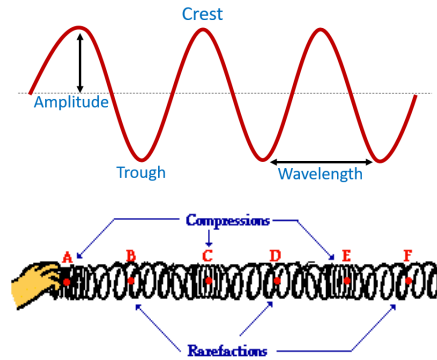
Longitudinal



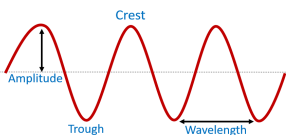
Measuring a Wave



Measuring a Wave



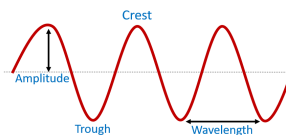
The Wave Equation



Frequency of a Wave $f = \frac{1}{T}$

T = period
f = frequency

The Wave Equation



Frequency of a Wave $f = \frac{1}{T}$

T = period
f = frequency

λ = wavelength
v = velocity

Wavelength $\lambda = \frac{v}{f}$

EXAMPLE Problem 3 In-Class Problem #1

Characteristics of a Wave A sound wave has a frequency of 192 Hz and travels the length of a football field, 91.4 m, in 0.271 s.

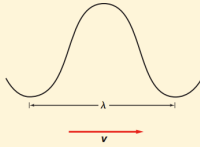
- What is the speed of the wave?
- What is the wavelength of the wave?
- What is the period of the wave?

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Characteristics of a Wave A sound wave has a frequency of 192 Hz and travels the length of a football field, 91.4 m, in 0.271 s.

- What is the speed of the wave?
- What is the wavelength of the wave?
- What is the period of the wave?

Known: $f = 192 \text{ Hz}$
Unknown: $v = ?$
 $d = 91.4 \text{ m}$ $\lambda = ?$
 $t = 0.271 \text{ s}$ $T = ?$

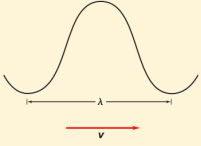


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a. Solve for v .

$$v = \frac{d}{t}$$

$$= \frac{91.4 \text{ m}}{0.271 \text{ s}}$$

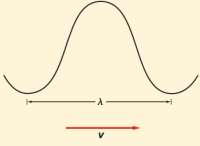
$$= 337 \text{ m/s}$$

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b. Solve for λ .

$$\lambda = \frac{v}{f}$$

$$= \frac{337 \text{ m/s}}{192 \text{ Hz}}$$

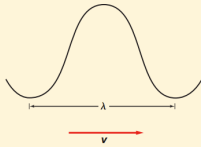
$$= 1.76 \text{ m}$$

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$$= 337 \text{ m/s}$$

b. Solve for λ .

$$\lambda = \frac{v}{f}$$

$$= \frac{337 \text{ m/s}}{192 \text{ Hz}}$$

$$= 1.76 \text{ m}$$

c. Solve for T .

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

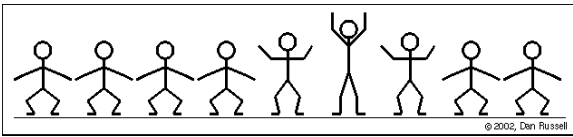
$$= \frac{1}{192 \text{ Hz}}$$

$$= 0.00521 \text{ s}$$

PRACTICE

Problems (1-5)

Transverse Waves



Longitudinal Waves

