

FPS - Sound and Light notes

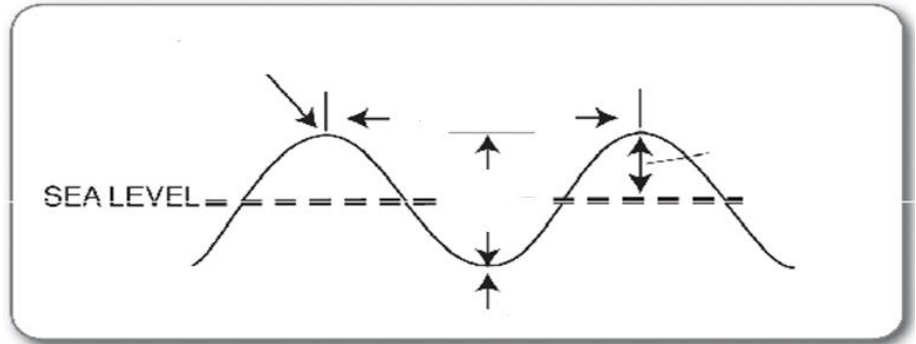
Name _____ Period _____

I can...

Distinguish between various regions of the electromagnetic spectrum.

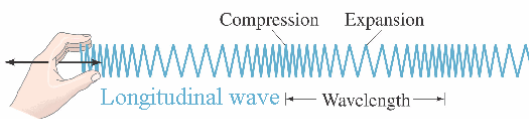
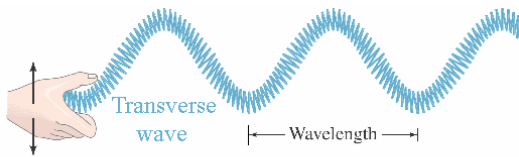
Sound and Light - Notes

1. Review: what are the parameters of a wave?



2. Types of waves

- Longitudinal → _____
- Transverse → _____



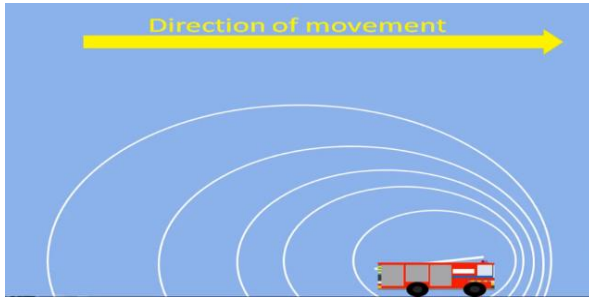
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3. Sound waves

- As intensity (amplitude) is increased, then the sound gets _____.
- As frequency is increased, then the sound gets _____.

4. Doppler Effect

- Change in _____ of a wave due to the _____ between _____ and _____.



5. Doppler Effect for Light Waves

A light wave change in frequency is noticed as a change in “_____”.

The Doppler Effect will cause shifts in frequency causing color shifts as:

Object coming toward = _____ Shift

Object moving away = _____ Shift

6. Electromagnetic Spectrum

- The electromagnetic spectrum spreads from _____ rays to _____, _____ rays, _____ waves and even longer _____ waves, _____, to _____ waves which can measure longer than a mountain range.
- Electromagnetic waves are similar to ocean waves in that both are _____ waves. They transmit energy.
- EM waves have _____ and _____ properties.
- Unlike ocean waves, EM waves travel through the _____ of space at the constant speed of light.
- Many EM waves are tiny and measured in billionths of a meter, or _____.

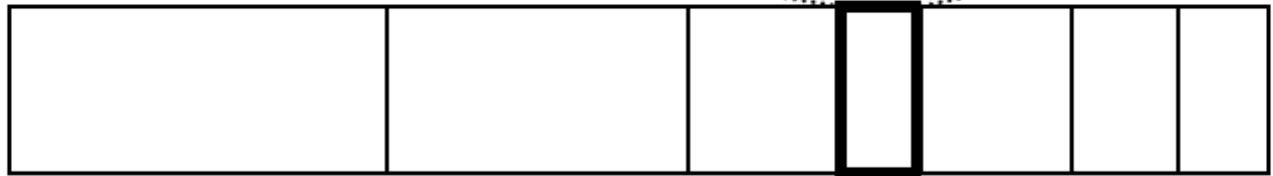
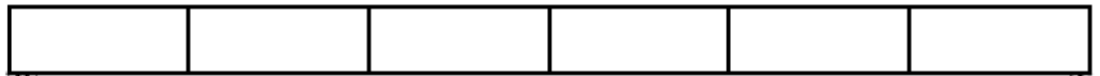
- Adding energy increases the _____ of the wave.
- Our eyes are tuned to a specific region of the EM spectrum and can detect energy with wavelengths of _____ to _____ nanometers, the visible light region of the spectrum.

(0:17-3:57)

7. Fill in the electromagnetic spectrum:



electromagnetic spectrum



high wavelength

low frequency

low energy

low wavelength

high frequency

high energy

List examples of each:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

8. Speed of Light

-
- speed of light = wavelength x frequency
- $c = 300,000,000 \text{ m/s}$

A radio station broadcasts a radio wave with a wavelength of 3.0 meters.

What is the **frequency** of the wave?

Given:

Rearrange:

Plug & Solve:

9. Practice Questions

- A radio station is emitting radio waves at a frequency of 4,291,845 Hz. What is the wavelength of the radio wave?
- The lunchroom microwaves have a wavelength of about 0.68 m. What is the frequency of the emissions?
- An infrared lamp emits rays at a frequency of 1,188,000,000 Hz. What is the wavelength?