Waves, Sound, Light Test Review

Test is 11/22 (A) and 11/25(B)

Waves

- The point of a wave is to TRANSFER energy
- All waves have a frequency (f) an amplitude and a speed at which they travel
- There are two types of waves
  - 1. Transverse (perpendicular to direction of movement)
  - 2. Longitudinal (parallel to direction of movement)

Go to youtube and type in:

Transverse and Longitudinal Waves

Frequency & Period

- These are different but similar…huh…
- Frequency = 1/period
- Period = 1/frequency

- Many people got confused on their reviews…don't forget the one divided by part! Other than that, it's plug and chug.

Frequency vs. Period

- So what's the difference?
- Frequency is how many cycles per one second
- Period is how many seconds per one cycle

- This is important to differentiate for your test!

Parts of a wave

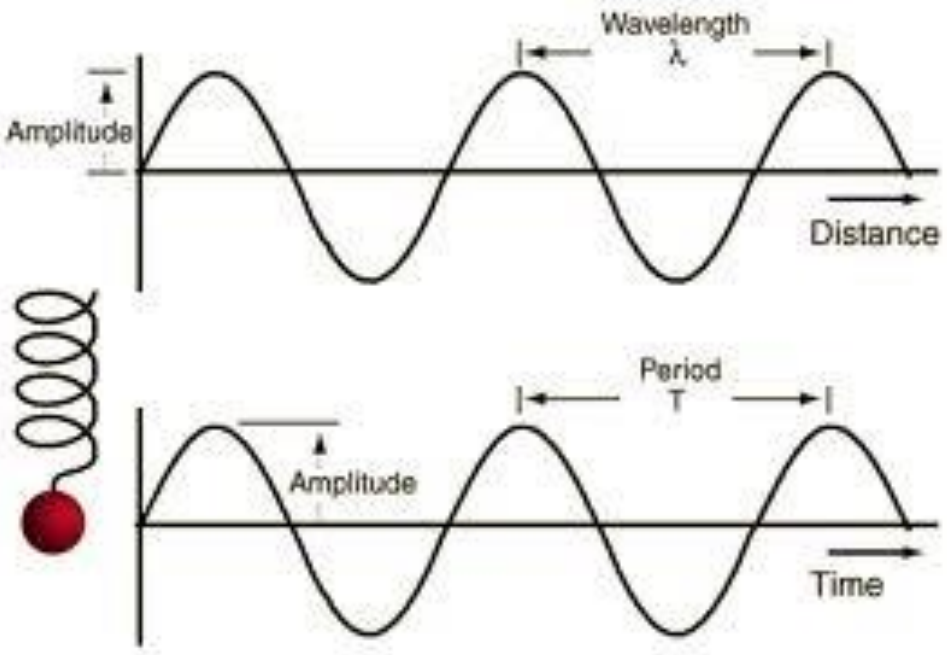
- Period, amplitude, wavelength
- Remember, amplitude is from 0 to the highest OR lowest point NOT from the crest to the trough!
- To find the period

Locate two IDENTICAL

Spots on the wave &

Find the distance btw

them using the x-axis

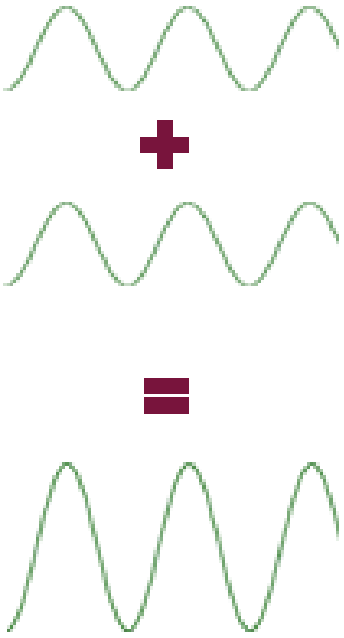


Wave interactions – with each other

Constructive Interference

In Phase

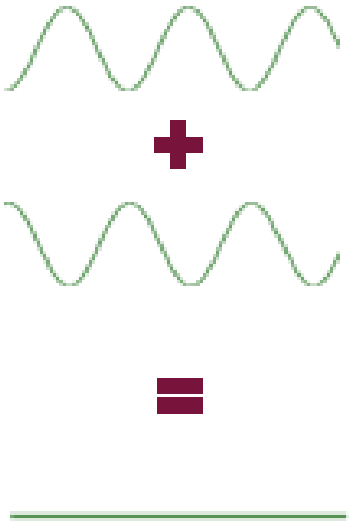
Waves add together



Destructive Interference

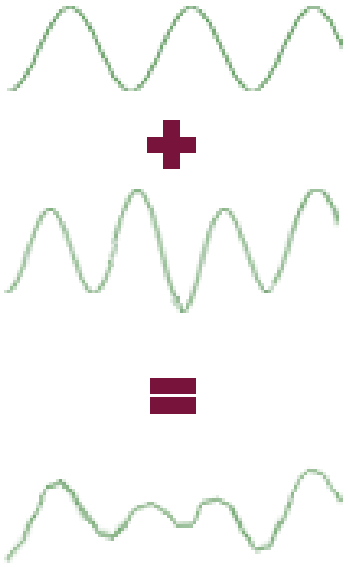
180° Out of Phase

Waves cancel each other

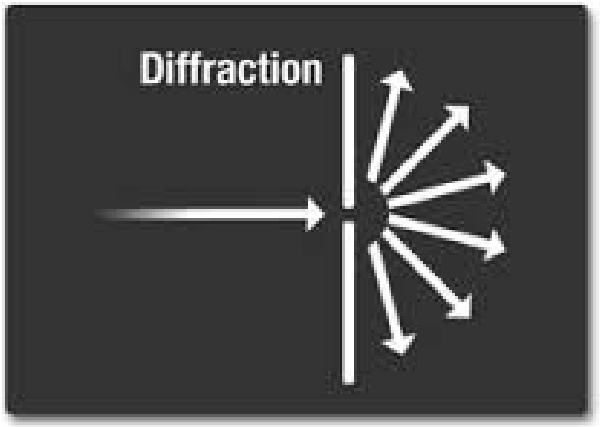


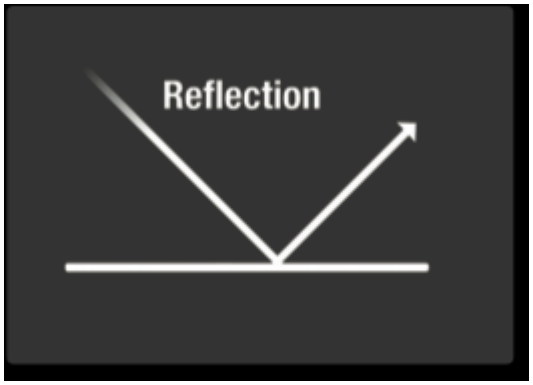
Different Waves

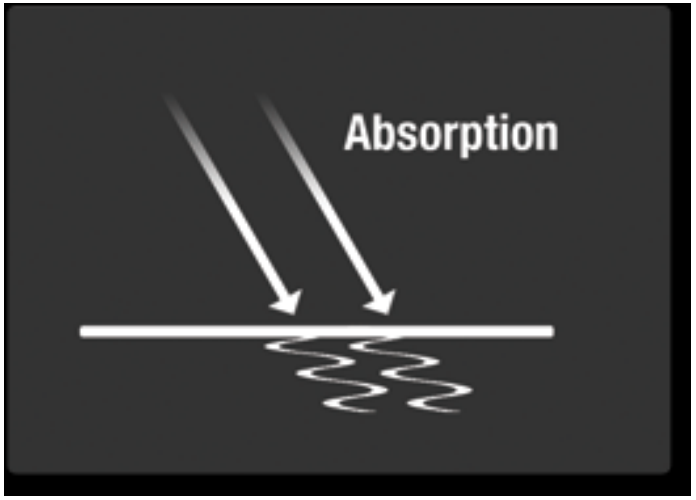
New wave created



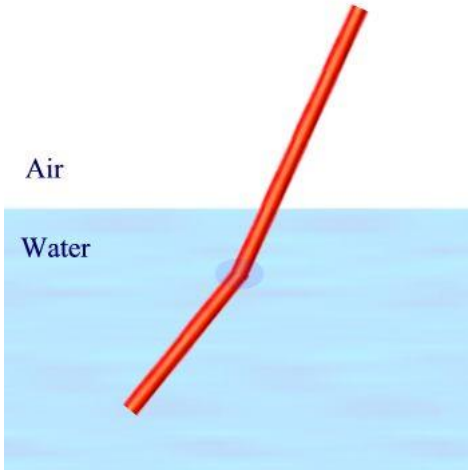
Wave interactions – with other objects







Refraction



Four Wave Interactions

- Remember some of the examples we used in class
  - Concert halls use special foam on the walls to absorb the sound waves and reduce reflection of sound
  - Light refracts when it hits a different medium like seeing a fish in the water
  - Water diffracts around islands

IMPORTANT

- Remember frequency and wavelength are INVERSELY PROPORTIONAL. When one goes up, the other one goes down! Draw it out!

Frequencies of light and sound waves

- Sound is an example of a longitudinal waves
  - Low frequency = low pitch sound
  - Low amplitude = soft sound
- Light is an example of a transverse wave
  - Low frequency = red color
  - Low amplitude = non-bright color

Human hearing

Remember, human hearing is about 20-20,000 Hz, but you may see this written 10-12,000.

We use the decibel system to measure the loudness of a sound

Sound FIRST hits are eardrum making it vibrate. This vibration of our eardrum passes to the bones in our ear and THEN to the chochlea

Supersonic

- This means that something is traveling FASTER than the speed and this causes a sonic boom when it flies by us
- The speed of sound is MUCH slower than the speed of light! This is why we see lightening before we hear thunder!

Sound travels..

- Faster in liquid than air and faster in a solid vs. liquid
- That means it will travel very fast in steel verses in the air
- The doppler effect occurs when an object:
  - High pitch coming towards us and…
  - Low pitch going away from us

EMS

- Know the EMS spectrum and the order of them (radios are the longest wavelength and gamma are the shortest)
- Know where the high frequency and low frequency ends are
- WE CAN ONLY SEE THE VISIBLE SPECTRUM, or the colors of the rainbow!

Fluorescent Bulbs and Sunscreen

- Why should we use them? Because they lose less energy as heat and are, therefore, more efficient.
- Incandescent bulbs, on the other hand, use heat and are less efficient

- Sunscreen should be worn to absorb and reflect UV light from the sun so it doesn't enter your skin and damage your cells and DNA

How we see

- Rods (black/white)
- Cones (color)

- Black is a LACK of color
- White is ALL the colors
- Colors we see are REFLECTED off objects

GOOD LUCK