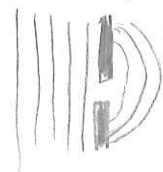


Topic 6C: Wave Phenomena (Boundaries, Interference, and Doppler Effect)

Skill 52: Waves Phenomena at boundaries or new mediums

Diffraction: Bending of a wave through an opening or around an obstacle. Wave remains in same medium



- For 2 different wavelengths through same opening; Large wavelength bends more than small
- For 2 waves of same wavelength through 2 different openings; Small opening greater bending

(Wave only behavior) Waves stay in medium so they don't change unless medium or depth is altered

Refraction: (See Skill 56)
Change in direction or wavelength of a wave or particle when medium changes.

- If passing on normal wavelength and speed are inverse to index of refraction (n)
- Angle bends toward normal in higher " n " and away from normal in lower " n "



Reflection: Bouncing of a wave off a surface (angle of incidence = angle of reflection)

Regular Reflection (smooth surface)



forms image

Diffuse Reflection (rough surface)



image does not form see skill 55

(Waves & Particles show this behavior)

Polarization: Waves can be filtered by "Polarity"



Think of polarizing glasses which reduce the intensity of light by stopping certain orientations.

ONLY WORKS ON TRANSVERSE WAVES

Skill 53: Interference, Standing Waves and Resonance

Waves pass through one another without being permanently changed. At the points where they overlap the amplitudes combine in a process known as interference

Constructive interference: Two crests meet to form a supercrest or Two troughs meet to form a supertrough. Amplitude increases

Destructive interference: A crest meets a trough resulting in decreased amplitude.

Standing waves: When waves of the same frequency and amplitude traveling in opposite directions meet, a combination of constructive and destructive interference with Nodes (destructive) & Antinodes (constructive)



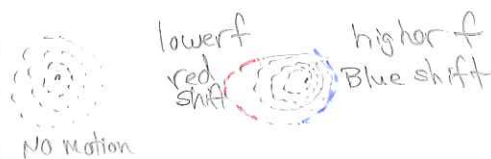
Resonance - occurs when the natural frequency of an object is matched by a wave from the surroundings.

Skill 54: Doppler Effect

The Doppler Effect occurs when a wave and an observer are in relative motion causing an apparent change in the frequency of the wave.

Toward
* If the source and observer are getting closer the frequency will increase. (For sound higher pitch, For light Blue shift)

Away
* If the source and observer are getting farther apart (Away) the frequency will decrease (For sound, lower pitch; For light Red shift)



No motion

If acceleration is happening frequency will continue to change
TOWARD Higher
AWAY Lower