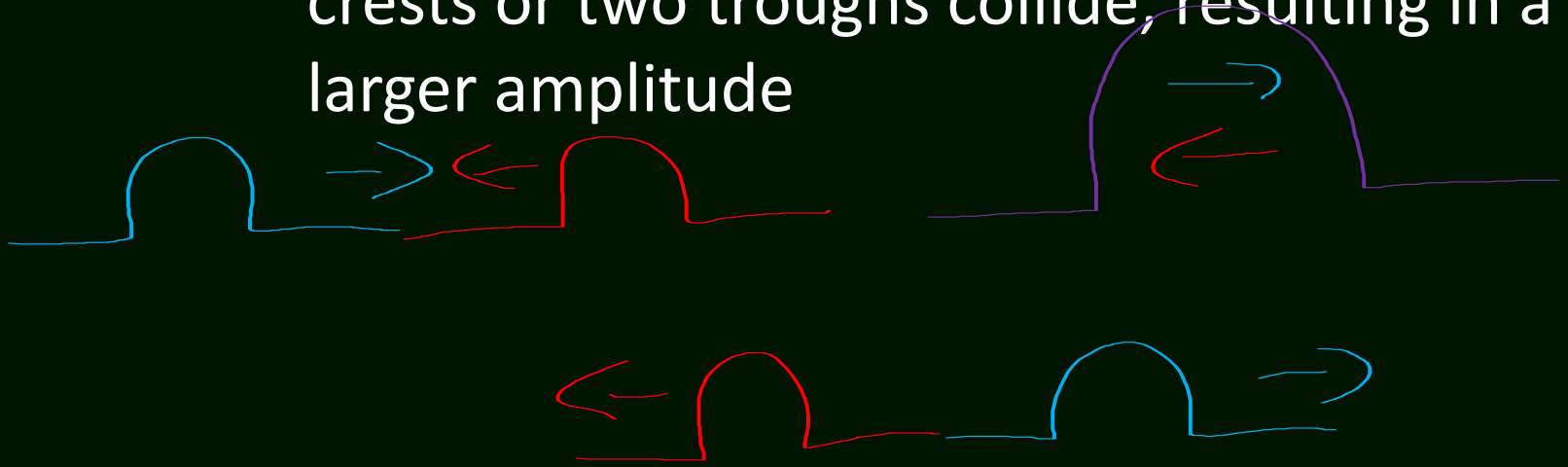
Waves

Waves

- Wave Interactions
  - Interference
    - Constructive interference occurs when two crests or two troughs collide, resulting in a larger amplitude



Waves

- Wave Interactions
  - Interference
    - Destructive interference occurs when a crest and a trough collide, resulting in a smaller amplitude

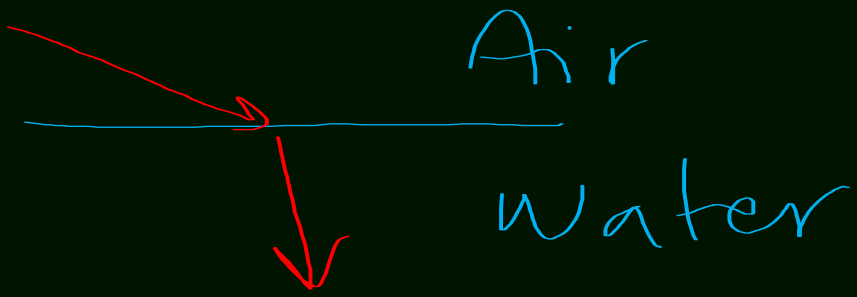
Waves

- Wave Interactions
  - Interference
    - The crests or troughs move through one another, they do NOT bounce off of each other

Waves

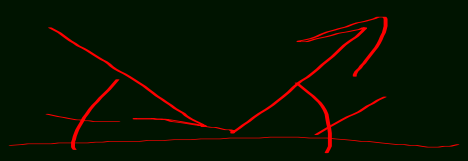
- When light waves hit a new medium, one of three things can happen
  - Absorption: the light energy is taken into the substance, causing the temperature in increase
    - Most materials are opaque, meaning they do not allow the light to pass through

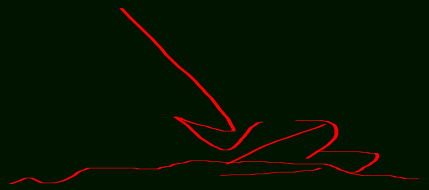
Waves



- When light waves hit a new medium, one of three things can happen
  - Transmission: the light energy is allowed to move through the substance
    - Refraction: when light enters a new medium, its speed changes, causing the light to bend
    - Most materials that transmit light are either transparent, meaning they allow all light to pass, or translucent, meaning they only allow some light through

Waves





- When light waves hit a new medium, one of three things can happen
  - Bounce Back
    - Reflection: light bounces back at the same angle it hit the surface with
      - Occurs when the surface is very shiny or smooth
    - Diffraction: light is scattered when it bounces back at many smaller angles

Waves

- The Doppler Effect
  - As a wave source approaches an object, the waves it emits begin to catch up to one another, resulting in a shorter wavelength and higher frequency
    - In light waves, this causes a blue shift
    - In sound waves, this causes a higher pitch

Waves

- The Doppler Effect
  - As a wave source moves away from an object, the waves it emits begin to spread out more, resulting in a longer wavelength and lower frequency
    - In light waves, this causes a red shift
    - In sound waves, this causes a lower pitch