

Mr. Schneider presents...

Wave Topics

Sound Waves

- Wave description parameters (λ, a, v, T, f)
- **Superposition**
- Reflection
- **Constructive & destructive interference**
- Standing waves (e.g., vibrating strings & resonating tubes)
- **Resonance**
- Harmonics
- Pitch
- Transverse vs. longitudinal waves
- Sound compression & rarefaction
- **Doppler shift**
- Sonic booms

Light Waves

- Electromagnetic waves
- **Electromagnetic spectrum**
 - **Frequency**
 - **Wavelength**
 - **Energy**
- Doppler effect
- **Emission, absorption & resonance**
- Transparency & resonance
- **Reflected color**
- **Rod cells vs. red, green & blue cone cells**
- **Additive primary colors (red, green & blue)**
- **Subtractive primary colors (cyan, magenta & yellow)**
- Scattering & selective transmission
- Least time principle
- **Reflection, refraction & surface normal**
- **Index of refraction**
- Wave fronts
- **Partial reflection & refraction**
- **Total internal reflection & the critical angle**
- **Dispersion**

Quantum Duality

- **Diffraction**
- Huygens' principle
- 1-slit & 2-slit **interference**
- Diffraction gratings
- Thin film iridescence
- **Polarization**
- Incandescence
- Emission & absorption spectra
- **Fluorescence**
- **Phosphorescence**
- Coherent light (e.g., lasers)
- **Photoelectric effect (light waves are also particles)**
- **Electron diffraction (electrons are also waves)**
- De Broglie wavelength
- Heisenberg's uncertainty principle