Light and Sound Notes
How Materials Transmit Light

• Transparent – allows most light to pass through
• Translucent – transmit some light, but also cause it to spread in all directions. You see light through the object, but can not see objects clearly.
• Opaque – no light is allowed to pass through because they reflect or absorb light.
Scattering

• Spreading out of light rays in all directions, because particles reflect and absorb the light.
  – Fog or dust in the air, mud in water, smudges on glass.

• Scattering makes the sky blue during the day because our atmosphere scatters blue more than the other colors. What color is present in the morning and evening?
Sound

• Sound is a type of mechanical wave.
• Vibrations are required to start a sound wave.
  – Your vocal chords

Sound can not travel in a vacuum. *Sound is compressional, which means it must have a medium.*
The Speed of Sound Depends on it’s Medium.

• Sound can travel through a solid, liquid and gas.

• Sound travels fastest through a solid because of refraction. The molecules are closer together, so it bounces faster. Think about a pinball machine.
Does Temperature Effect Sound?

- YES!!!!!
- The higher the temperature, the faster sound will move.
- On a hot day, you will hear people clearer than on a cold day.
Frequency Determines Pitch

• Pitch is the highness or lowness of a sound.
• The faster the vibration, the higher the sound.
• The highest frequency humans can hear is 20,000 hertz.
• The lowest is around 20 hertz.
Doppler Effect

• Is the change in perceived pitch that occurs when the source of the sound is moving.

• https://www.youtube.com/watch?v=WCEhidp8tiA
Doppler Effect

• https://www.youtube.com/watch?v=0rJPvGML9A0
Amplitude Effects Loudness

• If you increase the amplitude of a wave, the sound will become louder.
• The opposite is also true. If you decrease the amplitude of a wave, the sound will become softer.
Think of frequency as pitch and amplitude as volume.

- https://www.youtube.com/watch?v=YTZcSaPn92s