

Characteristics of a Sound Wave

- The **frequency** of a sound wave determines its pitch, or note
- A higher frequency wave will have a shorter **wavelength**, and a lower frequency wave will have a higher wavelength
- The **amplitude** of the sound wave determines its loudness

Reflection

- The **bouncing** of a sound
- **Reverberation** - multiple reflections of a sound wave; gives an “empty room” sound
- **Echo** - a focused reflection of sound
- **Acoustics** - the study of how sound behaves in a room or concert hall or our ears

Interference

- **Constructive** - wave energies add up
- **Destructive** - wave energies cancel out
- **Standing Wave** - a wave reflects back onto itself to form points of destructive interference (nodes) and areas of constructive interference (anti-nodes)
- **“Dead spots”** - points in a room where sound interferes destructively with itself

Refraction

- The **bending** of a wave
- When a wave changes its speed from one place to another, it bends
- Sound travels faster in warmer air, so if warmer air is above colder air then it bends downward

Doppler Effect

- When the source of a sound moves relative to an observer, the **apparent frequency** is different than the frequency of the sound leaving the source.
- When the source is approaching, the frequency seems higher
- When the source is departing, the frequency seems lower

The Sound Barrier

- When an object travels through a medium at the speed of a wave through it, it creates a large wave that extends out and back
- A boat creates a wake in water
- An air plane creates a sonic boom in air