Sound Energy

**Compressional (longitudinal) wave**

* A wave in which matter in the medium moves forward and backward in the same direction that the wave travels

**Compression**

* The region of crowded particles in a compressional (longitudinal) wave

**Rarefaction**

* The region of fewer particles in a compressional (longitudinal) wave

**Sound**

* Produced by vibrations
* The only type of energy you can hear

**Wave Length**

* Distance from 1 compression to the next
* 1 wave = 1 vibration

**Frequency**

* The number of waves that pass through a point in a second
* AKA vibration speed

**Speed of Sound**

* Travels fastest in solids because of the closer molecules
* Travels fastest in warm matter or higher temperatures
* Speed is measured in “Mach” numbers

**Pitch**

* How high or low a sound is
* Depends on the number of vibrations per second
* High frequencies will be high

**Sonar**

* High frequency sound waves are sent through water and reflected back when they strike something
* Distance can be determined by how long the reflection takes
* Developed by studying echolocation in animals

**Echolocation**

* Bats and dolphins use this to hunt and navigate
* They emit high-pitched sounds and listen for the echoes

**Hertz**

* Unit of measurement for frequency
* Humans can hear between 20Hz and 20,000 Hz

**Transmitted**

* Sound energy being passed through matter

**Absorbed**

* Sound energy trapped in matter
* Best if soft

**Reflected**

* Bounce back
* Hard/smooth reflect in 1 direction
* Hard/rough reflect in many directions

**Sonic Boom**

* Build up of waves in front of a supersonic transport

**Ultrasonic**

* Sonic frequency above 20,000 Hz that the human ear cannot sense
* used in medicine, sonar, cleaning, electronics

**Ultrasound**

* AKA sonogram
* Picture made w/ultrasonic waves of the inside of the body of unborn babies

**Supersonic**

* Speeds greater than the speed of sound
* SST is a vehicle that goes faster than the speed of sound

**Doppler Effect**

* Relationship between pitch and motion
* Pitch increases as car approaches and decreases as car goes by
* Compressed waves = high pitch
* Stretched waves = low pitch

**Noise**

* Unwanted or unpleasant sound
* Sound with an irregular wave pattern

**Sound Wave**

* Travels in straight lines from the point of disturbance
* Pleasant
* Noise/unpleasant – irregular pattern

**Decibels**

* The unit of measurement for intensity (LOUDNESS)
* Loud sounds cause hearing loss

**Intensity**

* AKA LOUDNESS
* Increase by **adding energy** to the sound – hit it harder

**Amplitude**

* The amount of energy in the wave
* How loud or intense the sound is