Sound Cheat Sheet

by Ayesha Talib via cheatography.com/173447/cs/36667/

INTRODUCTORY TERMS

sound is a form of energy which produces a sensation of hearing in our ears. it is produced by vibrating objects.

vibration is the rapid to and fro motion of an object.

the matter or substance through which sound is transmitted is called a **medium**. it may be solid, liquid or gas.

a **wave** is a disturbance that moves through a medium when the particles of the medium set neighboring particles into motion.

COMPRESSIONS AND RAREFACTIONS

compression is the region of high pressure	rarefaction is the region of low pressure

pressure is related to the number of particles of a medium in a given volume. more density of the particles in the medium gives more pressure and vice versa.

LONGITUDINAL WAVES Λ TRANSVERSE WAVES

particles of the medium vibrate parallel to the direction of wave	particles of the medium vibrate at right angles to the direction of wave
waves consist of compressions and rarefactions	waves consist of crests and troughs
propagates through solid, liquid and gas	propagates through solid and liquid
waves cannot be polarized	waves can be polarized
ex. sound waves, ultrasound waves, seismic P-waves	ex. light waves, radio waves, seismic S-waves

CHARACTERISTICS OF A SOUND WAVE

the distance between two consecutive compressions and two consecutive rarefactions is called the **wavelength**. SI unit is m.

the magnitude of maximum displacement in the medium on either side of the mean value is the **amplitude** of a wave. SI unit is that of density or pressure.

frequency is the number of oscillations per unit time. SI unit is Hz.

time taken by two consecutive compressions/rarefactions to cross a fixed point is called the **time-period**. SI unit is s.

speed of sound is the distance travelled by a wave per unit time.

CHARACTERISTICS OF SOUND

how the brain interprets the frequency of an emitted sound is called its **pitch**. pitch corresponds on frequency.

quality or timbre of sound is that characteristic which enables us to distinguish one sound from another having the same pitch and loudness.

a sound of a single frequency is called a **tone**.

sound produced due to a mixture of several frequencies is called a **note**.

noise is unpleasant to the ear. **music** is pleasant to hear and is of rich quality.

LOUDNESS Λ INTENSITY

is a measure of response of the ear to the sound	is the amount of sound passing each second through a unit area
SI unit is dB	SI unit is W/m^2

THE LAW OF REFLECTION OF SOUND

states that the directions in which the sound is incident and reflected make equal angles with the normal to the reflecting surface at the point of incidence and the three lie in the same plane.

ECHO

the repetition of a sound caused by reflection of sound waves is called an **echo**.

conditions for hearing an echo

time interval b/w source and reflected sound = more than 0.1s.

minimum distance b/w source and reflector = 17.2m.

intensity/loudness of sound should be sufficient for reaching the ear so as to be audible.

size of reflector must be large.

REVERBERATION

repeated reflection that results in persistence of sound is called reverberation.

ex. megaphones, loudhailers, horns, stethoscopes, ceilings of concert, cinema and conference halls [curved soundboard]

examples of sound absorbers: compressed fibreboard, plaster, draperies

RANGE OF HEARING

INFRASOUND	ULTRASOUND
sounds of frequencies less than 20Hz	sounds of frequencies higher than 20kHz
rhinoceroses [5Hz], whales & elephants	dolphins, bats, rats & porpoise

humans: 20Hz-20kHz; children under 5 and dogs: 20Hz-25kHz

SOUND WAVES /\ LIGHT WAVES

longitudinal waves	transverse waves
cannot travel through vacuum	can travel through vacuum
speed of sound in air is 343m/s	speed of light in air is 3.10^8m/s
have low frequency and high wavelength	have high frequency and low wavelength

By **Ayesha Talib**
cheatography.com/ayesha-talib/

Not published yet.
Last updated 23rd January, 2023.