Notes: Sound

## Waves

Sound is a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** wave (a type of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** wave)



## Sound

Sound is a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**produced by the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of an object and transmitted to the object’s environment

As an object vibrates (like the membrane on a drum) it moves up and down **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** the air molecules next to it

* These continue to bump each other like dominoes

## Guitars and Vocal Cords

By **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**or strumming the strings on a guitar we cause them to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* The soundboard on an acoustic guitar is hollow and helps **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** the sound
* Just like the strings on a guitar our vocal cords produce sound by vibrating

## How do we hear?

We are able to hear sounds once the sound wave reaches our **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Just like when you tap a drum, the air molecules being pushed by the sound wave hit the eardrum and cause it to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is not only filled with **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**but also lined with **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**cells

As the eardrum **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, it causes the fluid to “slosh” around which moves the receptor cells

* Like seaweed (or an anemone) in the ocean

## Amplitude and Frequency

Just like light waves, sound waves have both **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

For sound:

* Its **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** determines how **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**the sound is
* Its **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** determines the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**of the sound

## Amplitude

The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of sound depends on its **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, meaning how much energy it transmits

We measure the intensity (amplitude) of sound using the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (dB) scale

* An increase in 10 dB means that a sound becomes **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**louder
	+ E.g. 65 dB is 10 times louder than 55dB
	+ 75 dB is 10 times louder than 65dB
	+ 75 dB is 100 times louder than 55dB

**Loud music and hearing loss**

Prolonged exposure to sounds louder than **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**can cause **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

***60-60 rule*** : You shouldn’t listen to music for more than 60 minutes at 60% of the maximum volume

**Threshold of hearing**: The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**that a healthy person can hear

## Frequency

Frequency is the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**per **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

The**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**of the sound changes its tone or **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* low frequency = **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** sound
* High frequency = **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**sound

Just like with light, frequency and wavelength are related

* Low frequency = **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**wavelength
* Higher frequency = **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**wavelength



The human ear can generally hear between **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* As you age you lose the ability to hear the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**of the spectrum