

HOW IS SOUND MADE?



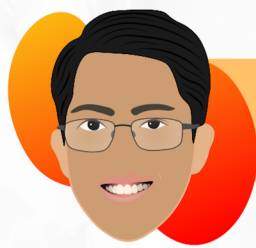
CONCEPTS

waves; sound; properties of sound

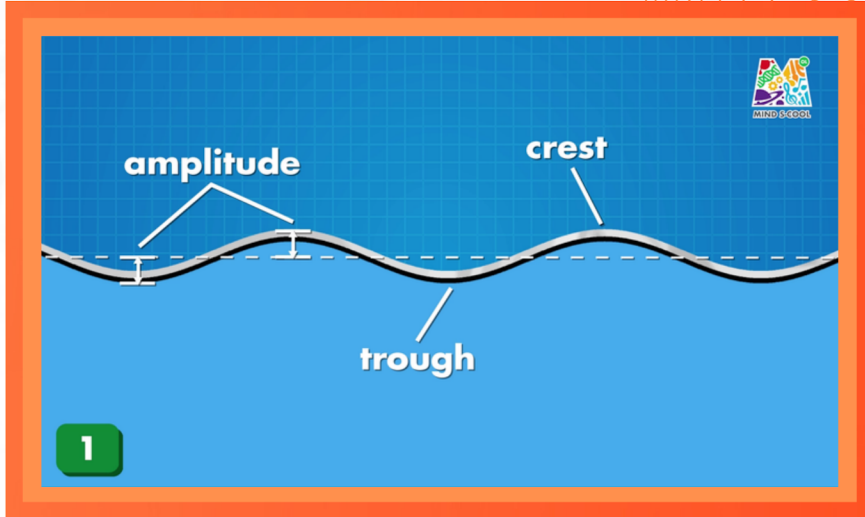
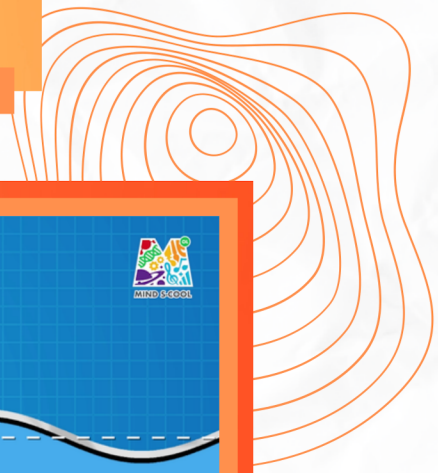
CURRICULUM CODES

S3FE-IIIg-h-4, S3FE-IIIi-j-3, S4FE-III-f-g-4, S4FE-IIIh-5, S4FE-IIIi-j-6, S6FE-III-d-f-2, S7LT-IIIc-4-5, S7LT-III-d-6-7, S7LT-III-e-8-9, S8FE-I-e-24-25

#1 WHAT KIND OF WAVE IS SOUND MADE OF?



WAVES are vibrations or disturbances that carry **energy**.



FORMULA

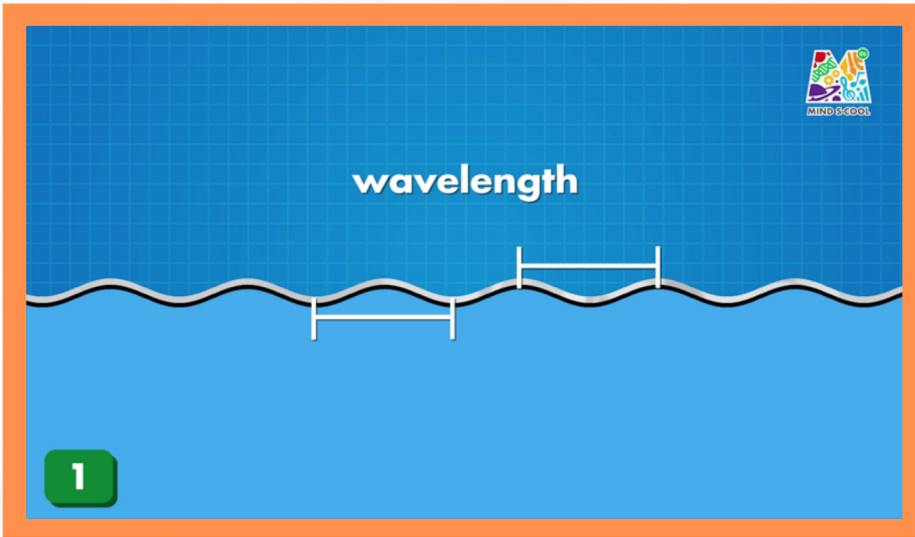
WONDER BOX

1 Hz = $\frac{1 \text{ oscillation}}{\text{second}}$

"The repeated motion of a wave is called **OSCILLATION!**"



The number of oscillations a wave makes per unit of time is called its **FREQUENCY**. It is measured in units called **HERTZ (Hz)**.

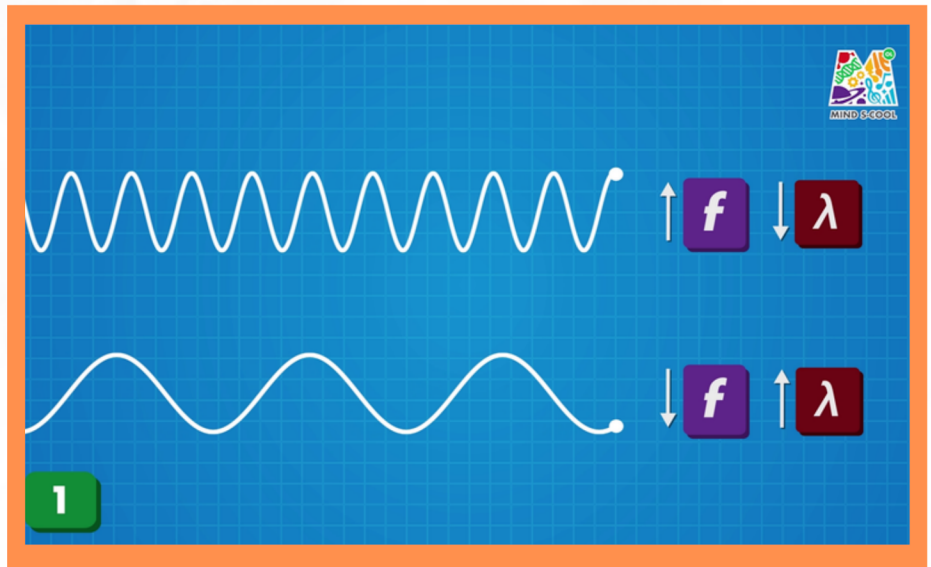


"One **WAVELENGTH** is equal to the distance of one crest to the next or one trough to the next."



Higher frequency results in shorter wavelength

Lower frequency causes longer wavelength



FORMULA



A wave's **VELOCITY** is equal to its **WAVELENGTH** multiplied by its **FREQUENCY**.



#2 KINDS OF WAVES



"In **TRANSVERSE WAVES**, the oscillations are at right angles to the direction of travel."

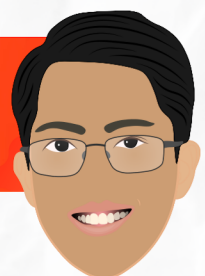


"In **LONGITUDINAL WAVES**, like sound, the oscillations are parallel to the direction of travel."

MECHANICAL WAVES need a material to move through. Sound is a mechanical wave.



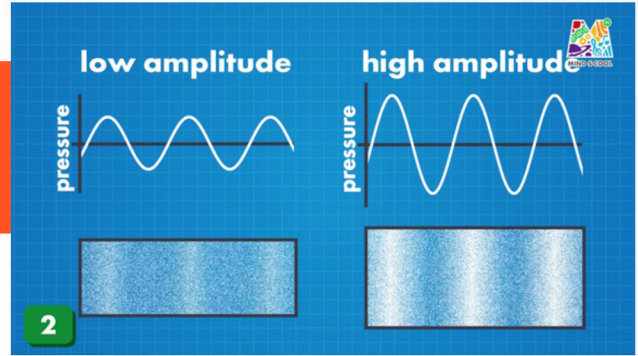
ELECTROMAGNETIC WAVES, such as light, can travel through empty space.



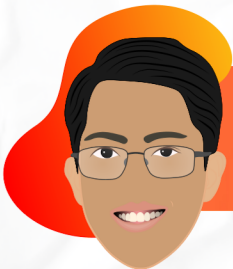
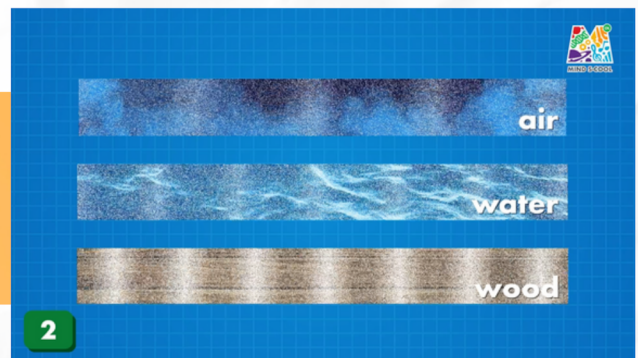
#3 PROPERTIES OF SOUND



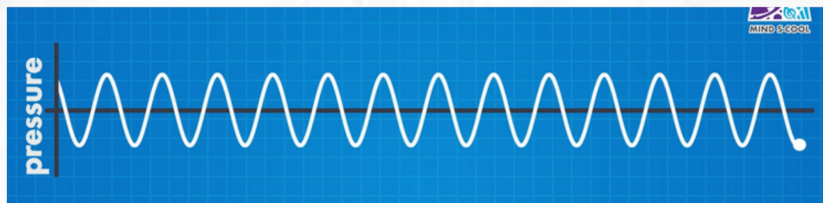
"The loudness of sound is related to its **AMPLITUDE**. The higher the amplitude, the louder the sound!"



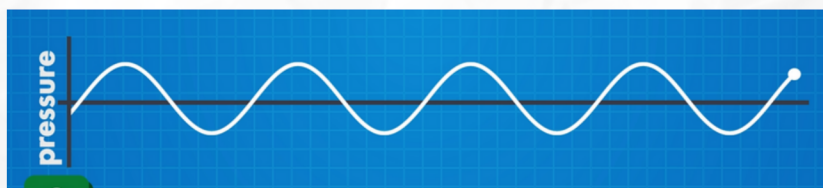
"The **SPEED OF SOUND** depends on the material and temperature. Sound travels faster through water than through air. It also travels faster through warmer materials."



"Sound also has **PITCH**, which is the highness or lowness of sound. It is related to the wavelength and frequency."



Shorter wavelength and higher frequency creates sound with **higher pitch**.



Longer wavelength and lower frequency creates sound with **lower pitch**.

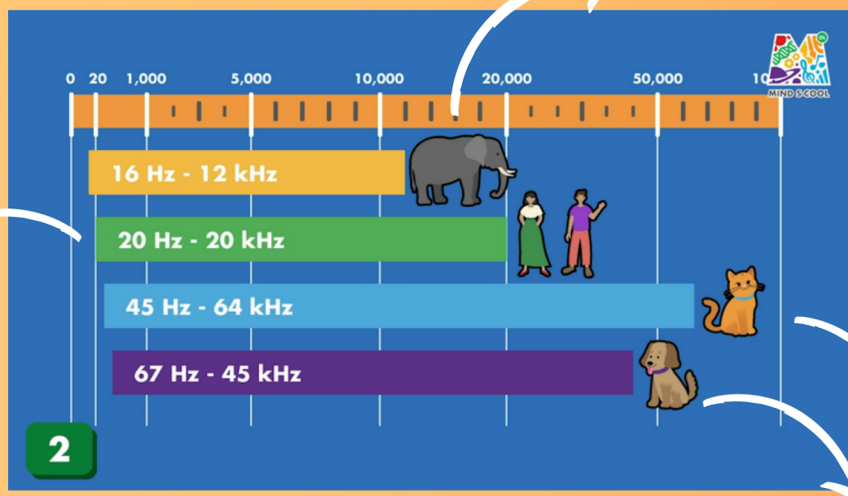


Sounds with frequency lower than 20 Hz are called **INFRASOUND**.



Sounds with frequency higher than 20 thousand Hz are called **ULTRASOUND**.

The Philippine crocodile and elephants can communicate through infrasound.



Humans can hear sound with a frequency between 20 Hz to 15 thousand Hz.

Dogs can hear sound with frequencies up to 45 thousand Hz, while cats can hear up to 64 thousand Hz.