



eduresourceza.com

P12 Sound

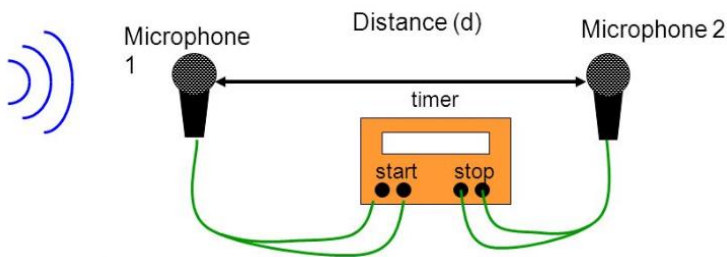
P12.01 Making sounds

- Sound travel through the air as vibrations
- Vibrations can through any material
- When vibrations reach ear, they cause eardrum to vibrate
- Vibration is converted to electrical signals to the brain

P12.02 At the speed of the sound

- Speed of the sound in the air = **330m/s**
- Can calculate the speed by **echo**

1. Measuring the speed of sound



1. Bang two wooden blocks together → sound
2. Sound reaches one microphone, electric current travels the timer
3. Few seconds later, sound reaches the second
4. Second pulse of current stops the timer
5. Timer indicates the time taken for the sound

2. Different materials, different speeds

- Speed: **solids > liquids > gas**

P12.03 Seeing sounds

1. Pure notes

Periods (T): number of seconds for one vibration

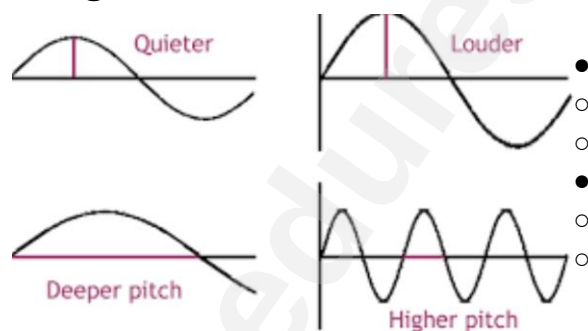
- Period unit - seconds

Frequency (f): number of vibrations per second

- Frequency unit - hertz(Hz)

$$\text{Frequency}(f) = \frac{1}{\text{Period}(T)}$$

2. High and low, loud and soft



Amplitude: determine the loudness(centre ~ peak)

Quieter - lower amplitude

Louder - higher amplitude

Frequency: determine the pitch

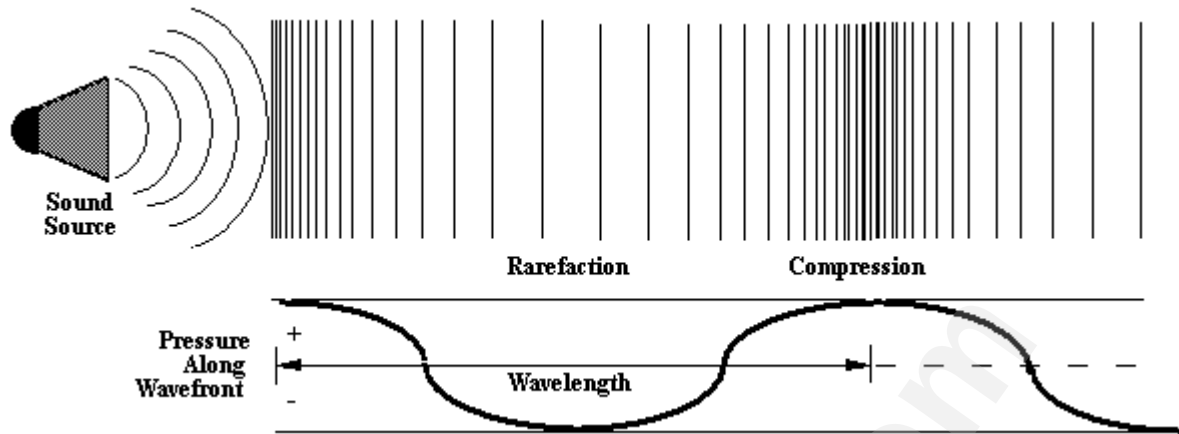
Deeper pitch - lower frequency

Higher pitch - higher frequency

3. Range of hearing

- Human can hear **20Hz ~ 20000Hz**

P12.04 How sounds travel



1. Vibrations are transmitted through the air

2. The particles of the material (air) are alternately compressed together and then rarefied as the sound passes through

1. Compression, rarefaction

Compression: the area of the sound wave where the air molecules are close together

Rarefaction: the area of the sound which the air molecules are less closely packed together, or rarefied