ODM EDUCATIONAL GROUP
Changing your Tomorrow

SOUND

PHYSICS

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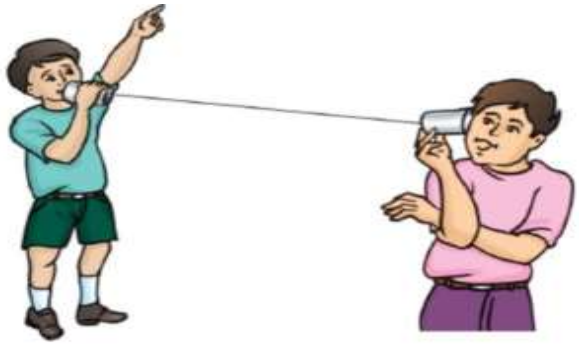
PROPAGATION OF SOUND THROUGH SOLIDS

- Propagation of sound: Sound can travel through solids.



PROPAGATION OF SOUND THROUGH DIFFERENT MEDIA

- Sound can travel through liquids
- Sound can travel through gases.
- Sound cannot travel through vacuum.
- The substances through which sound travels is called medium.
- The medium can be solid, a liquid or gas.

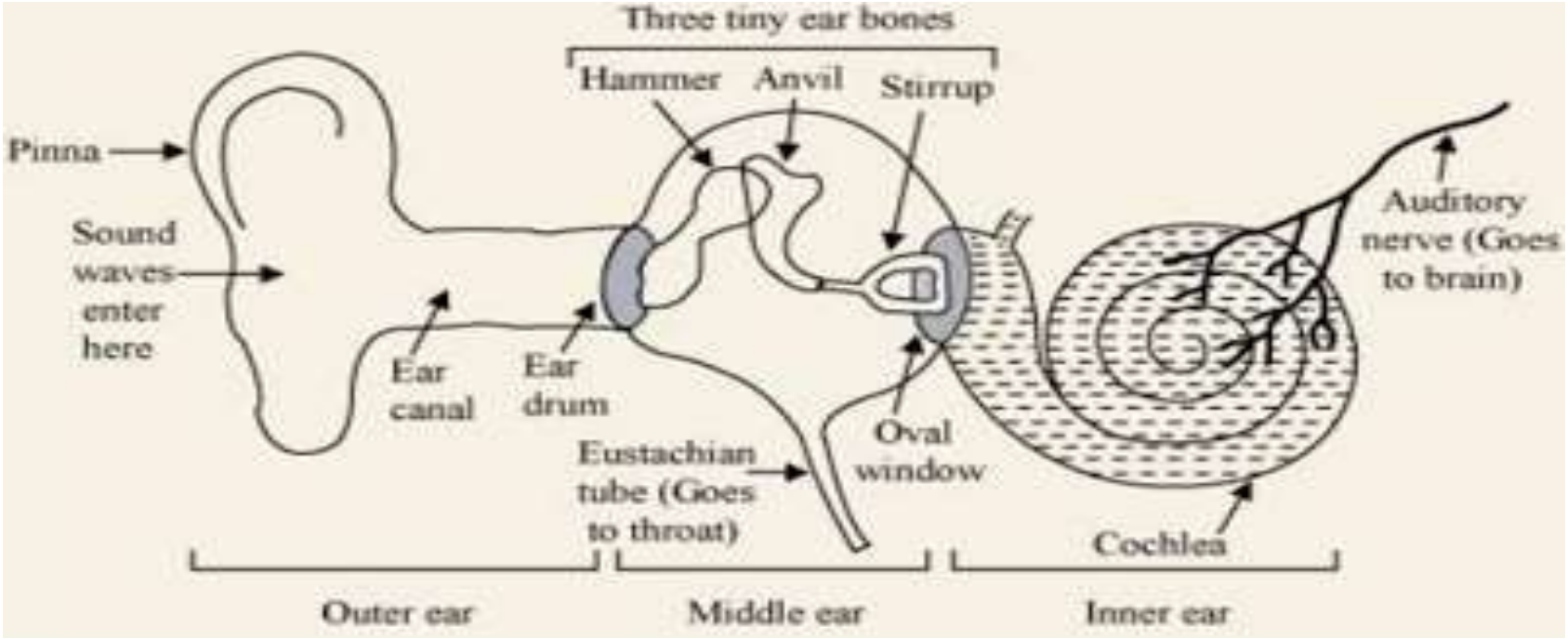
PROPAGATION OF SOUND THROUGH DIFFERENT MEDIA

- **Sound** needs a material medium like solid, liquid, or gas to travel and be heard because the molecules of solid, liquid, and gases carry sound waves from one place to another.
- **Sound** cannot travel through vacuum or empty space because vacuum has no molecules which can vibrate and carry sound waves

Speed of Sound:

- Speed of sound is maximum in solids and minimum in gases.
- The speed of sound in air at 0^0 C is 330 m/s.

Human Ear



PARTS OF HUMAN EAR

- The ear consist of 3 compartments:
- 1)Outer
- 2)Middle
- 3)Inner

OUTER PART

- Part of the ear which we see outside
  1)Pinna:Board part
  2)Ear canal:2-3 cm long passage
  3)Ear drum(Tympanum):At the end of ear canal is thin,elastic and circular membrane

MIDDLE PART

- **Middle Part**
  1)It consist of **three small and delicate bones** called hammer,anvil and stirrup .They are linked to each other.
  2)**Eustachian Tube**:The lower part of middle ear has a narrow tube going to the throat.It connects middle ear to throat and ensures that air pressure inside middle ear is same as that on the outside.

INNER EAR

Inner Part

1)Cochlea: Coiled tube

One side is connected to middle ear through elastic membrane over window.The cochlea is filled with a liquid.The liquid contains nerve cells which are sensitive to sound.the other side of cochlea is connected to auditory nerve which goes into the brain.

Assessment:

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- Name that part of ear which vibrates when outside sound falls on it?
- Question 2 Name the tiny bones present in middle part of ear?
- Question 3 What is the function of tiny bones in the middle ear?
- Question 4 Name the tube which connects the middle ear to throat?
- Question 5 Explain the working of ear?
- Question 6 Name the nerve which carries electrical impulses from cochlea of ear to the brain?

Characteristics of sound

- Sound can be characterized by loudness, pitch and quality
- Loudness: Sound can be loud or soft.
- Loudness depends on three factors:
- 1. Amplitude of vibration
- 2.Area of vibrating body
- 3.Distance of listener from source of sound.

Characteristics of sound

- Amplitude of vibration: Loudness is proportional to square of the amplitude.
- Area of vibrating body: The greater the area of the vibrating surface, the louder the sound produced.
- Ex: A big drum produces a louder sound than a small drum.
- Distance of listener from source of sound: Sound waves lose energy as they travel. So the nearer the source, the louder the sound.

Characteristics of sound

- Pitch:
- Pitch denotes shrillness or flatness of sound.
- Pitch of children and women are more than that of men.
- Pitch of sound depends on frequency.
- Quality: The quality of a sound is a property by virtue of which two sounds of the same pitch and loudness can be distinguished.

Audible and in audible sound

- Audible Sound: The sounds of frequencies between 20 Hz and 20000 Hz are known as audible sound.
- In audible Sound: The sounds of frequency less than 20 Hz and more than 20000 Hz are known as in audible sound.
- Infrasonic Sound: The sound waves of frequency less than 20 Hz are known as infrasonic sound

ULTRASONIC SOUND AND INFRASONIC SOUND

- Ultra sound: The sound waves of frequency more than 20000 Hz are known as Ultra sound.
- Sonic Sound: The audible sound is also known sonic sound.
- If the frequency of a sound is below 20 Hz will it be audible to human beings?
- What is an ultrasound?
- Give at least 3 uses of ultrasonic vibrations.
- Why we do not hear the screams of a bat?
- What is an audible sound?
- What is an inaudible sound?

Noise and noise pollution

- Sounds that are loud and unnecessary are called **noise**
- The presence of loud, unwanted and disturbing sound in our environment is called noise pollution.
- **Major sources of noise pollution:**
- The motor vehicles running on the road produce noise pollution by blowing horn and sound of their engines.
- The bursting of crackers on various social and religious occasions produce noise pollution.
- The various machine in factories make loud sounds and cause noise pollution.
- The take off , landing, and flying of aeroplane produce noise pollution.

Noise and noise pollution

- The playing of loud speakers and bands at marriage and other functions.
- The construction of buildings produce a lot of noise.
- Loud playing of radio, speaker systems and televisions produce noise pollution

Harms of noise pollution

- 1) loud noise can cause great harm to our ears. Constant loud noise reduces the hearing power of our ears. loud noise can even damaged ears permanently and cause deafness.
- 2)Loud noise can cause a person to lose concentration in his work or studies.
- 3) loud noise can cause an ailment called Hypertension.
- 4) loud noise can cause irritation and headache.
- 5) loud noise during night time disturbs our sleep. Continued lack of sleep is bad for health.

THANKING YOU

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