LESSON 13:SOUND

CLASS – VIII

SUBJECT- SCIENCE

MODULE **1**

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AECS -3,MUMBAI

CLASS VIII
CHAPTER-13

SOUND

INTRODUCTION

In our daily life, we hear different types of sounds like, ringing of school bell, honking of vehicles, sound of playing guitar or tabla etc.

We hear different voices of different persons, animals etc.

Sound is a form of energy that produces the sensation of hearing in our ears.

Sound is produced due to vibrations.

WHAT ARE VIBRATIONS?

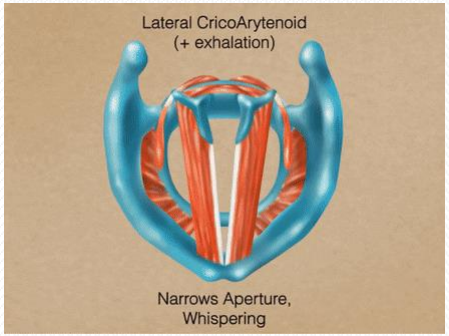
- We know that the to and fro motion of a body from its rest position is called oscillatory motion .Eg. Motion of a swing, simple pendulum etc.
- The oscillatory motion in which the body assumes a new shape during its motion, is called **vibratory motion**. In vibratory motion, a part of the body oscillates keeping its other parts fixed.
- Vibrations are fast oscillations.

Examples

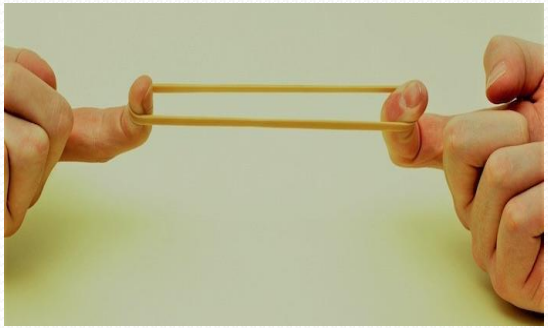
- When you blow a whistle,the vibrations of particles in air produces sound.
- When a bell is struck,it vibrates to produce sound.
- When we speak,our vocal cords vibrate to produce sound in the larynx.
- When you pluck a stretched rubber band,it vibrates and produces sound.

Each source of sound is a vibrating body.

Bell

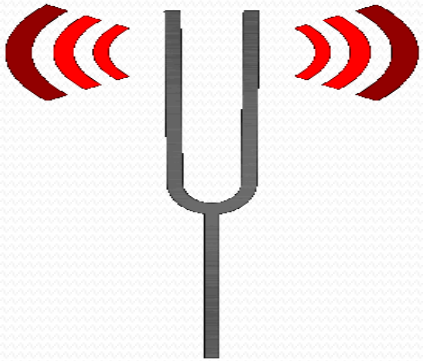


Voice box



Stretched
Rubber band

More examples of vibrating bodies



Tuning Fork

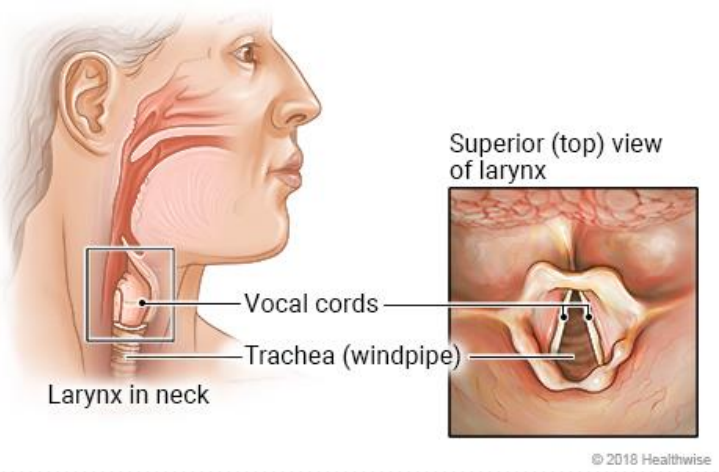
Drum

Ektara

Sound produced by humans

- Human beings produce sound when our vocal cords vibrate on blowing air through them by our lungs.
- Our throat has a part called **larynx**. The voice is produced in the larynx. It is also called **voice box**. It is located at the upper end of windpipe. Two vocal cords are stretched across the voice box or larynx in such a way that it leaves a narrow slit between them for passage of air.
- When the lungs force air through the slit, the vocal cords vibrate, producing sound.

Voice box or larynx



We can feel the vibrations of the vocal cords when reciting or speaking, if we put our fingers on our throat.

Sound needs a medium for propagation

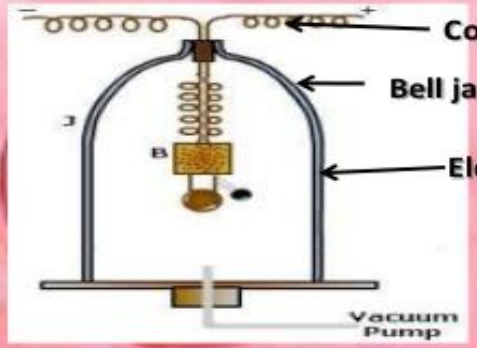
Sound cannot travel through vacuum.
Sound requires a medium for its propagation i.e. for travelling from one point to another.

SOUND NEEDS MEDIUM TO TRAVEL

Sound is a mechanical wave and needs a medium for propagation. Sound travels through solids, liquids and gases. Sound does not travel in vacuum.

Activity:-

Suspend an electric bell in an air tight bell jar. Connect the bell jar to a vacuum pump. If the switch is pressed, we can hear the sound of the bell. If air is pumped out through the vacuum pump, we cannot hear the sound of the bell. This shows that sound needs a medium to travel and sound cannot travel in vacuum.



DOES SOUND TRAVEL THROUGH LIQUIDS?

Take a bucket or a bathtub. Fill it with clean water. Take a small bell in one hand. Shake this bell inside the water to produce sound. Make sure that the bell does not touch the body of the bucket or the tub.

Place your ear gently on the water surface (Fig. 13.11). *(Be careful : the water should not enter in your ear.)* Can you hear the sound of the bell? Does it indicate that sound can travel through liquids?

Propagation of sound through liquids

Another simple activity to understand propagation of sound through liquids is-

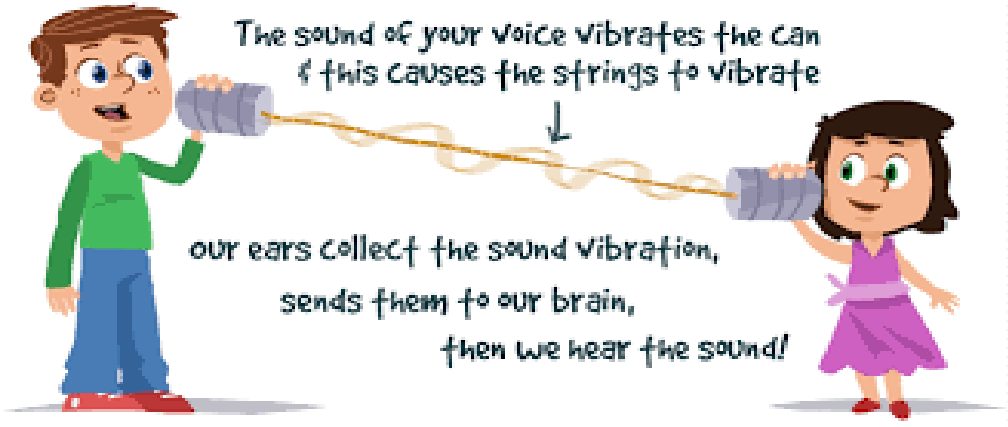
Take a metallic container and fill it with water. Take two coins and hit one on the other inside water. You will be able to hear a sound. Now place your ear against the side of the container and again hit one coin on the other inside the water. You will hear a louder and clear sound than in first case.

Propagation of sound through solids

Activity : To show that sound can travel through solids.

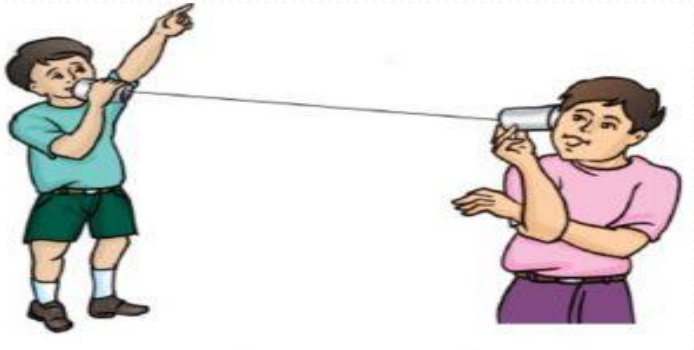
Take two empty ice cream cups. Make a small hole at the bottom of each cup and pass a long thread through them. Tie a knot at each end of the thread so that the thread does not slip out through the holes. This makes a toy telephone .

A Toy Telephone



Sound can travel through solids.

- Now, use the toy telephone as shown in the picture and talk to your friend. You will be able to hear the sound of your friend. This shows that sound travels through the thread and reaches your ear.So,sound can travel through a solid



Propagation of sound through air

- Activity
- Ask your friend to sing a song loudly standing at one corner of the room. You will hear the sound standing anywhere in the room. This shows that sound can travel through air.

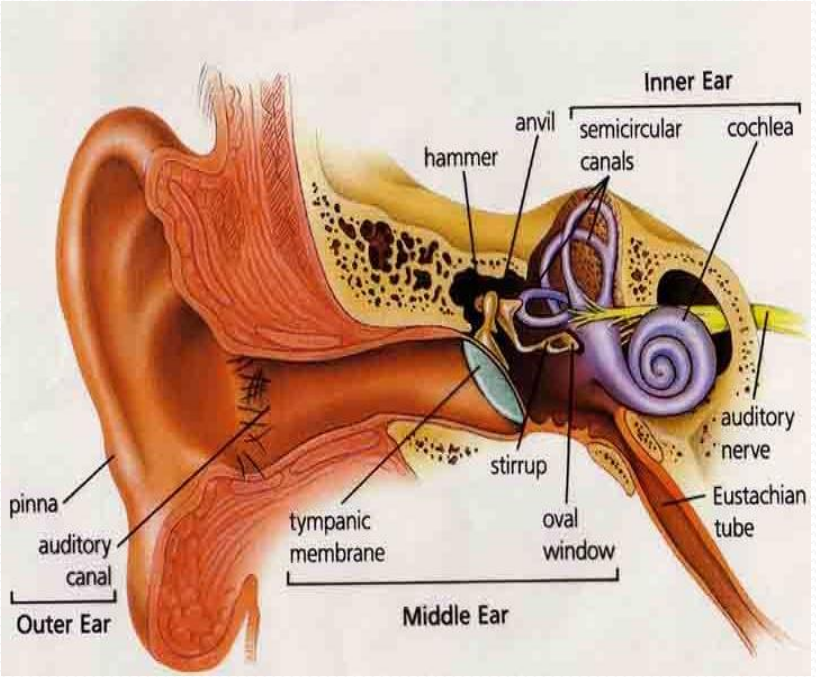
WE HEAR SOUND THROUGH OUR EARS

The human ear consists of three main parts.

- External ear: It consists of pinna,auditory canal and ear drum(tympanum). Its function is to collect and direct the sound waves to the middle ear.
- Middle ear: It consists of three tiny bones that vibrate in response to the vibrations of the ear drum.

  The three tiny bones intensify the vibrations picked up from ear drum by 20 to 25 times. They transfer the vibrations to inner ear.
- Inner ear : It basically consists of a part called cochlea which is associated with hearing.

  The sound waves are converted into nerve impulses in inner ear and travel through the auditory nerve to the brain.



THANK YOU