CHAPTER 13

SOUND

Introduction:

Sound plays an important role in our life. We hear a variety of sounds in our surroundings. These sounds are produced in various ways, of which some examples are given below.

Ex.

1) Communicating with each other by means of sounds produced by vocal cords.

2) Musical instruments like flute, tabla, harmonium, etc.

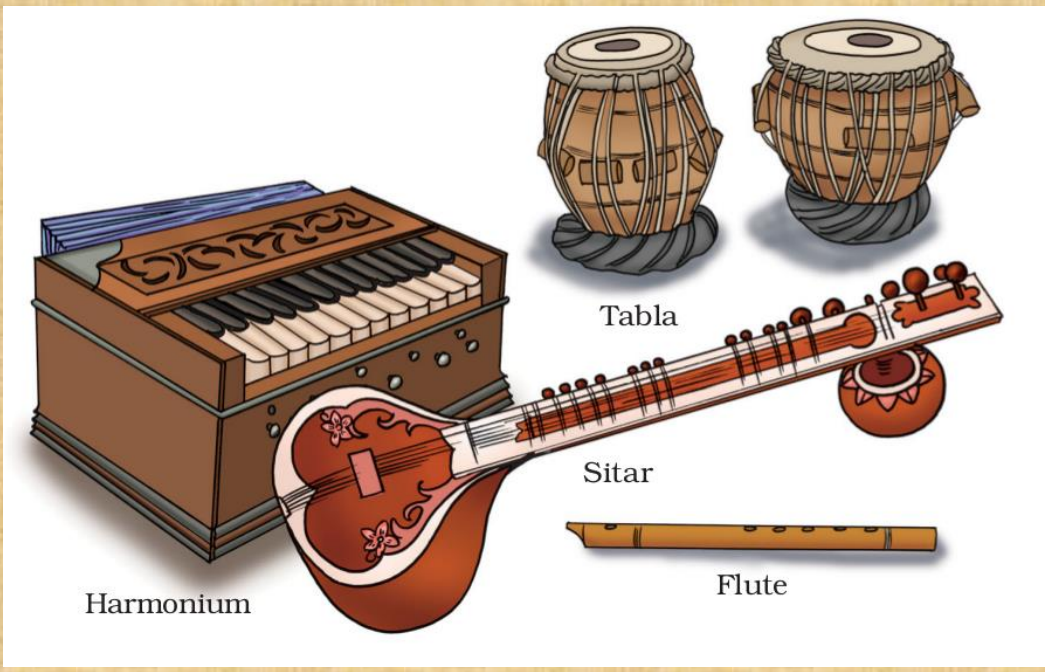

Fig. Some musical instruments

How is the sound produced?

"A vibrating body produces a sound". The to-and-fro motion of an object is termed 'vibration'. If a body vibrates, the sound is produced. This can be easily observed by touching a vibrating body; if the body has stopped vibrating, then there cannot be any sound.

Animations:

1. School bell ringing

2. Playing the violin

2. Jaltarang

The sound produced by Humans:

In humans, the sound is produced by the voice box of the larynx. The hard bump that is seen on the throat is the voice box. It is at the upper end of the windpipe. Two vocal cords are stretched across it leaving a narrow slit for passage of air.

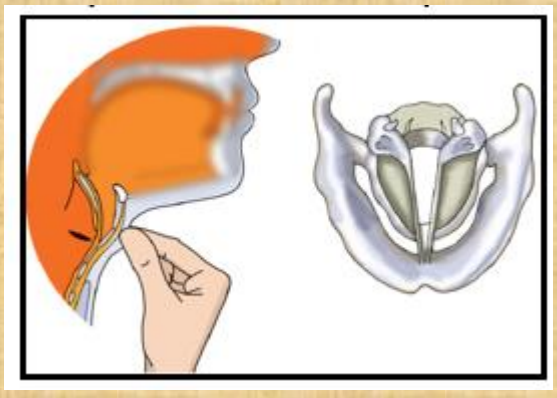

Fig. Voice box in humans

When the lungs force air through the slit, the vocal cords vibrate producing sound. This sound quality depends on how the cords react to the muscles

i.e... If vocal cords are tight and thin, the quality of sound is different from when they are loose and thick.

How does the sound propagate?

Sound travels from one region to another region in the form of a wave. A sound wave requires a medium to propagate.

Sound travels through solids, liquids, and gases.

$$V_{solids} > V_{liquids} > V_{gases}$$

The velocity of sound in air is 330 m/s.

Sound cannot travel through a vacuum.

$$V_{vacuum} = 0$$

Fig. Sound can travel through solids

Fig. Sound travelling through water