

St. Andrews Scots Sr. Sec. School

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Session: 2022-2023

(Question & Answers)

Class: VIII

Subject: Science

Chapter: Sound

Check Point (Page 143)

1. Fill in the blanks:

- a. Vibration is a **to and fro** motion.
- b. Sound is produced by **vibrations**.
- c. The musical instruments produce **pleasant** sounds.
- d. In a shehnai, vibrations of **air column** produces sound.
- e. Jal tarang is a **musical instrument**.

2. Name two sources of sound.

Ans - Horn of vehicle, Musical instruments

3. Name the sound-detecting body part in humans.

Ans - Ear

4. Name a musical instrument that produces sound by vibrations in a stretched membrane.

Ans - Drum

5. Name an air-blowing sound

Ans - Flute

6. Name a musical instrument which produces sound when air column vibrates.

Ans - Trumpet

Check Point (Page 146)

1. State whether the following sentences are True or False:

- a. All creatures in nature have a voice box. **False**
- b. Sounds can propagate through any material medium. **True**
- c. A region or space without any medium is called a vacuum. **True**
- d. Ear is a sound-producing as well as a detector. **False**

e. Larynx is a sound-producing instrument. **True**

2. Which part inside our throat vibrates to produce a sound?

Ans - Larynx connected at the top of the wind pipe.

3. List three uses of sound.

Ans - Sound is used for:

- a. communicating with each other by talking or listening
- b. for signalling, for example, buzzer to give signals
- c. echolocation—sound waves produced by bats and dolphins for distance measurement.

4. Sound travels fastest in: air, water or iron?

Ans - Sound travels fastest in iron.

5. Which part of the ear vibrates by sounds?

Ans - Eardrum in the middle ear region.

Check Point (Page 148)

1. Match the correct answer:

- | | | |
|----------------------|---|-------------------------------------|
| a. Amplitude | → | i. Shallow sound |
| b. Lion's roar | → | ii. Number of vibrations per second |
| c. Frequency | → | iii. Maximum displacement |
| d. Chirping of birds | → | iv. Shrill sound |

2. What is the unit of frequency?

Ans - Frequency is measured in Hertz.

3. What do we call the frequency range that humans can hear?

Ans - Audible frequency range

4. Fill in the blanks:

- a. Women have a high, pitch voice and men have a high amplitude voice.
- b. Frequency is the inverse of the time period.

Check Point (Page 151)

1. Match the correct answer:

- a. Noise → i. Pleasant sound
b. Music → ii. Unit of sound level
c. Decibel → iii. Unpleasant sound

2. State whether the following sentences are True or False.

- a. Sound insulation of a room is done to reduce noise pollution. **True**
b. A sudden and arbitrary change in amplitude and frequency of a sound produces music. **False**
c. Loudness of a sound is measured in 'bel'. **True**

3. List two differences between noise and musical sounds.

Ans –

MUSICAL SOUND	NOISE
1. It is produced by systematic vibrations.	1. It is produced by irregular vibrations.
2. There is no abrupt or arbitrary change in amplitude and frequency of sound.	2. There are sudden and arbitrary changes in amplitude and frequency of sound.

4. Name two common sources of noise.

Ans - Traffic noise, barking of dog.

Exercises (Page 153)

A. Choose the correct answer:

1. Typically, the medium for propagation of sound is _____.
a. air ✓ b. water c. iron d. hydrogen gas
2. Loudness refers to the magnitude of the _____ of sound.
b. amplitude ✓ a. shrillness c. frequency d. pitch
3. Sound waves cannot travel through _____.
d. vacuum ✓ a. liquid b. solid c. gas
4. In a violin, sound is produced by the _____ of a string.
a. vibration ✓ b. bending c. rotation d. folding
5. The level of normal conversation is about _____ dB.

a. 20-30 **b. 50-60 ✓** c. 80-90 d. 110-120

B. Name the following:

1. All unpleasant and unwanted sounds - **Noise**
2. A form of energy that travels at the speed of about 332m/s - **Sound**
3. All songs and instrumental sounds - **Musical sounds**
4. A unit of noise measurement - **Decibel**

C. Short answer questions. (Page 153)

1. What is sound? Why can't we imagine a world without sound?

Ans - Anything that we hear is a sound. Chirping of birds, sound of moving train, musical sound produced by a guitar are some of the sounds that we often hear. Sound is an important part of our lives. We communicate with each other by talking and listening. When we speak, we make sounds and when we listen we hear sounds.

2. Define amplitude and frequency of a sound.

Ans - Amplitude of the vibration is the maximum displacement of the vibrating object on either side of its mean position. Frequency of a vibration is defined as the total number of complete vibrations by the vibrating object in one second. In other words, frequency is the number of oscillations per second. Frequency is measured in the unit hertz. Its symbol is Hz. A frequency of 10 Hz means that the object oscillates 10 times in one second. The audible frequency is from 20 Hz to 20,000 Hz.

3. What is a vocal cord? What causes a vocal cord to vibrate?

Ans - Inside the larynx, there are two stretchable vocal cord tissues. When we speak, the throat muscles pull or push the vocal cord tissues and thus make them tight or loose. It produces a gap between them and thus provides a passage for the air to pass through them into the windpipe. These stretched tissues are forced to vibrate by passing air. The vibrating vocal cords produce the human voice.

4. Why is the upper part of the voice box covered by a flap?

Ans - The upper part of the voice box is covered by a flap. This prevents the entry of food and other foreign substances into the voice box.

5. What is decibel? Give some samples of decibel level measurements

Ans - The loudness of sound is measured in 'bel' unit. It is a large unit and rarely used. A smaller unit decibel (dB) is defined to measure intensity of sound. A 10 decibel increase in sound intensity is perceived as doubling of loudness. The faintest audible sound is arbitrarily assigned a value of 0 dB. The loudest sounds that can be tolerated by the human ear are about 120 dB. The intensity level of normal conversation is about 50 dB to 60 dB. Moderate auto traffic measures about 50 dB.

6. What is the function of an eardrum in human ear?

Ans - Eardrum is a thin, tightly stretched membrane. The sound vibrates the eardrum. These mechanical vibrations of eardrum in turn vibrate the hair like nerve cells present in the inner ear region. Nerve cell vibrations produce electrical signals, which are then propagated to the brain to generate sound or sensation of hearing.

7. Give three examples each of a shrill and a shallow sound.

Ans - Examples of shrill and shallow sound are as follows.

- a. A whistle makes a shrill sound as it has a higher pitch or frequency, while a drum makes a shallow sound as it has a lower frequency of vibrations.
- b. Women have a shrill voice than men, that is, the pitch of a woman's voice is higher than that of a man's voice.
- c. A bird chirping is a shrill sound while a lion's roar is a shallow sound

8. What do you mean by a sound of frequency 20 Hertz? What will be the time period of this sound?

Ans - The frequency of 20 Hz means that the object oscillates 20 times in one second to produce the sound.

The relation between the frequency and time period is given as follows.

$$\text{Frequency} = 1/\text{Time period}$$

Or

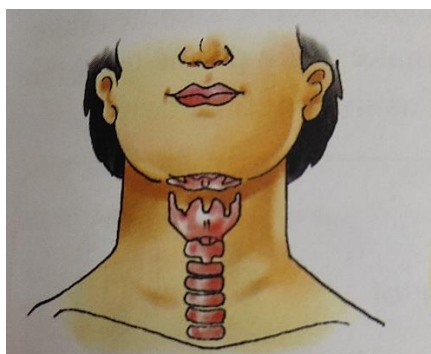
$$\text{Time period} = 1/\text{frequency}$$

$$\text{Time period} = 1/20 = 0.05 \text{ s}$$

D. Long answer questions. (Page 153)

1. Explain with the help of a diagram of larynx, the mechanism of human sound production.

Ans - All human beings have a voice box in the region around the throat connected at the top of the windpipe to produce sound. It is also known as larynx. It is like a soundproducing instrument. Inside the larynx, there are two stretchable vocal cord tissues. When we speak, the throat muscles pull or push the vocal cord tissues and thus make them tight or loose. It produces a gap between them and thus provides a passage for the air to pass through them into the windpipe. These stretched tissues are forced to vibrate by passing air. The vibrating vocal cords produce the human voice.



Vibrations in vocal cord produces sound

2. Identify the various parts of different musical instruments which vibrate to produce sound.

Ans - The various parts of different musical instruments, which vibrate to produce sound are:

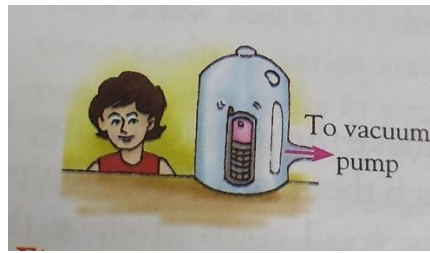
MUSICAL INSTRUMENT	VIBRATING PART
Guitar	Metal string
Flute	Air columns
Ghatam	Metal sheets
Drums	Leather membrane
Sitar	Metal string

3. ‘Sound waves need a medium for propagation’. Explain with the help of demonstration.

Ans - Take an airtight jar. Keep your mobile phone inside it. Dial the number of your mobile phone from some other phone. Do you hear any sound? Yes you will. Even though the jar is airtight, the air inside it acts as intervening medium and thus propagates the sound of the ring outside the jar. Next use an evacuation pump (vacuum pump that takes off the air present inside the jar) to create vacuum inside the jar. Again ring the mobile phone kept in the jar. This time you will not be able to hear the ring sound or it will be feeble. This proves that the sound needs a medium for propagation.



A mobile phone ringing inside an airtight jar



A mobile phone ringing inside an evacuated jar

4. What is noise pollution? Write its main causes and effects.

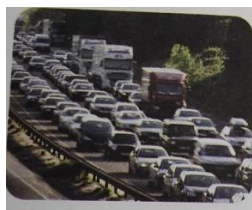
Ans - Noise pollution is the presence of all unwanted sounds in the environment that unreasonably interfere in our daily activities.

The main causes of noise pollution are given as follows.

- a. Road traffic: transport mediums are the worst offenders, producing excessive noise.
- b. Rail traffic: rail transport is also not free from noise pollution although it affects only a smaller group of population.
- c. Air traffic: aeroplane engines generate a lot of unwanted noise.
- d. Industrial noises: increase in the number of industries in urban areas is becoming a major source of noise pollution.
- e. Neighbourhood noises: barking of dogs, lawn mowers

Effects of noise pollution –

Sleep disturbances, headache, tension, interference in communication or even a hearing loss.



Road traffic



Train



Aeroplane



Industrial sources

Causes of noise pollution

5. Suggest some steps to reduce noise pollution in your locality.

Ans - Some of the steps to reduce noise pollution are as follows.

- a. All motor vehicles must be fitted with silencers.
- b. The use of pressure horn must be restricted.
- c. Factories must be relocated away from the residential colonies.
- d. Volume of television, music system must be kept low.
- e. Use of loudspeakers must be restricted in the residential areas.

Let's Think (Page 153)

1. How does larynx in the throat help to produce sound?

Ans - The larynx sits at the top of the windpipe, or trachea. It helps produce vocal sounds and closes the windpipe during swallowing so that no food particles pass into the lungs. Inside the larynx there are two stretchable vocal cord tissues. When we speak, the throat muscles pull or push the vocal cord tissues and thus make them tight or loose. It produces a gap between them and thus provides a passage for the air to pass through them into the windpipe. These stretched tissues are forced to vibrate by passing air. The vibrating vocal cords produce the human voice.

2. You must have seen that radio stations have FM or AM after their channel number. What role does this FM or AM play?

Ans - Both AM and FM radio programmes are transmitted over the air via radio waves, which are part of a broad range of electromagnetic waves. To be turned into useful signals that transmit information (music or voice) it must be modulated, and modulation is the basis for AM and FM radio signals. In fact, AM stands for amplitude modulation and FM stands for frequency modulation. Another word for modulation is change. The electromagnetic radiation must be modulated or changed to be useful as a radio transmission. Without modulation, no information is carried in a radio signal. A blank piece of paper is useless unless it is modulated or changed. Someone must write or draw on the paper for it to communicate useful information. Hearing is another example; still air must be modulated or changed with music or a voice to be useful. In another words the AM or FM carries the music signal to us, so that we can listen to it.

3. Pitch of a female voice is higher than that of male voice. Explain.

Ans - Apparently it is because trachea or larynx in the throat of males is opened wider than females and it also depends on how the air comes out of your throat.