

# **St. Andrews Scots School**

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Session: 2025-2026 – Answer Key

**Class: VIII**

**Subject: Science**

**Chapter: Sound**

## **CHECK POINT 1**

1. (T) 2. (F) 3. (T) 4. (F) 5. (T)

## **CHECK POINT 2**

1. Material medium
2. Gases
3. 340 m/s
4. Outer Ear
5. Auditory nerve

## **CHECK POINT 3**

1. hertz (Hz)
2. second (s)
3. Musical sounds
4. decibel (dB)
5. 20,000 Hz
6. Noise

## **PRACTICE TIME**

### **A. Tick (✓) the correct answer:**

1. (d) 2. (c) 3. (a) 4. (b) 5. (b)

### **B. Assertion-Reason Type Questions:**

1. (a) 2. (a) 3. (c) 4. (b) 5. (d)

### **C. Fill in the blanks:**

1. sound

2. vibrating
3. percussion
4. larynx
5. ultrasounds

#### **D. Very Short Answer Type Questions:**

1. Tabla, Dholak
2. We hear echo due to reflection of sound.
3. Vocal cords
4. Speed of sound in air is approximately 340 m/s. 5. Frequency

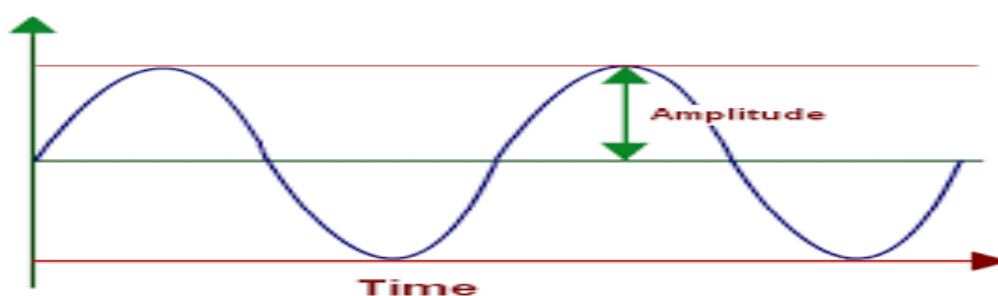
#### **E. Short Answer Type Questions:**

1. The instruments in which air (wind) is blown in from the mouth of the player to produce sound are called wind instruments. Trumpet, shehnai, flute, bugle, are some wind instruments.

2.

<b>String Instruments</b>	<b>Percussion Instruments</b>
1. In these instruments, generally metal strings of specific metal and thickness are made to vibrate, in order to produce the sounds	1. In these instruments, a specific hollow shape is closed by a stretched skin of animal. This skin is beaten with a stick or hand, in order to make it vibrate which, in turn, vibrates the air inside the instrument to produce sound.
2. Sounds of different musical notes are produced by controlling the thickness and tightness of the strings.	2. These instruments are used to provide the beats or the rhythms to the music. Beats or rhythms are controlled by tightness of stretched skin and striking strength with hands or sticks.

3. The maximum displacement of the particle or object from its mean position to its either side is defined as its amplitude. The SI unit for measuring the amplitude is metre



**Amplitude of a Sound Wave**

4. (a)–(iii), (b)–(iv), (c)–(i), (d)–(ii)
5. The audible limit of human ear is from 20 Hz to 20,000 Hz.
6. A sound becomes noise when it starts irritating our ears.

#### **F. Long Answer Type Questions:**

1. Echolocation is the phenomenon of locating objects by the reflection of sound waves. The sound waves are reflected back from the objects which come in their path and are perceived by the ear. This helps in locating the direction and distance of the objects.

2. Sound waves can travel through liquids. It can be shown experimentally as follows:

Procedure: Take a bucket full of water and a key bunch with at least 3–4 keys. Sit in such a position that you can bend your head to almost your ear touching the water level in the bucket. Hold the key bunch in one of your hands and take it inside the water in the bucket, making sure that your hand or key bunch doesn't touch the sides or the bottom of the bucket. Now, bend down your head so that one of your ears is just touching the water in the bucket. Gently, shake the key bunch inside water.

Observation and Conclusion: The sound of keys is clearly heard. Thus, it is clear that sound waves can travel through water (liquid).



Sound waves travel through liquids

3. Noise pollution is the unwanted and displeasing human created sound that disrupts the environment. The noise pollution affects both health and behaviour. It can cause annoyance and aggression, hypertension, high stress levels, hearing loss, sleep disturbance and tinnitus. Tinnitus can lead to forgetfulness, severe depression and at times panic attacks. High noise pollution can cause cardiovascular disorders. The noise pollution can be controlled by following ways:

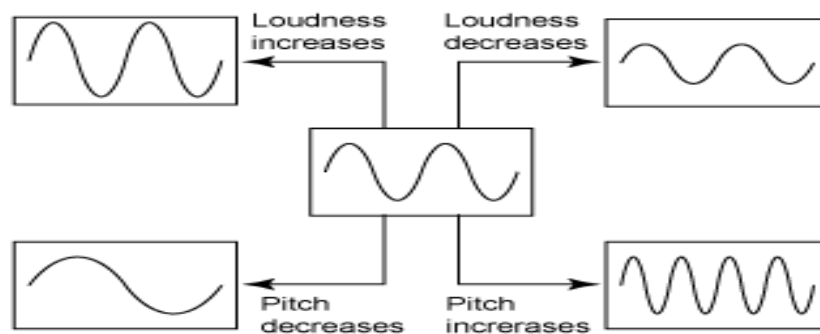
- ☐ The speed of vehicles should be limited.

- The heavy duty vehicles on roads should be limited.
- The traffic rules should be followed strictly.
- The loudness of the audio entertainment systems, the speakers during religious and family functions should be kept as low as possible.

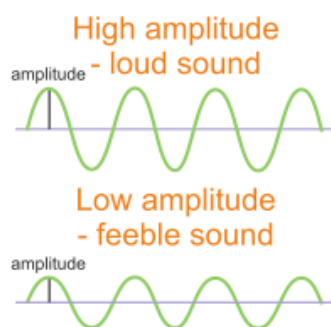


### Noise Pollution

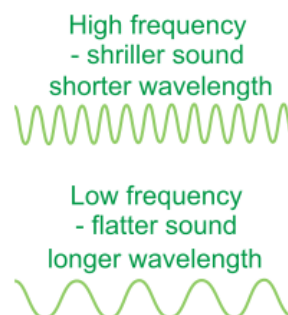
4. The loudness of a sound represents the amplitude of a sound wave. A sound wave with a small amplitude produces a low-volume sound or less loud sound, whereas a sound wave with a large amplitude produces a high volume sound or more loud sound. The pitch represents the shrillness or hoarseness of the sound. The pitch of a sound depends directly on its frequency. The low frequency sounds have low pitch, and are hoarse and blunt. On the other hand, high frequency sounds have high pitch, and are sharp and shrill.



### Loudness and Pitch of a Sound



**Loudness**



**Pitch**

5. Number of oscillations ( $n$ ) = 50 and  $t = 10$  s,  $T = ?$

Time period, ( $T$ ) =  $t/n = 10/50 = 0.2$  s and

Frequency,  $\nu = 1/T = 1/0.2 = 5$  Hz

6. Number of vibrations made in 1 s = 400, i.e., frequency,  $\nu = 400$

$\therefore$  Time period  $T = 1/\nu = 1/400 = 0.0025$  s

7. (a) 1—Pinna, 2—Auditory canal, 3—Eardrum, 4—Auditory nerve

(b) The outer ear called pinna collects sound waves.

(c) The part labelled

3, i.e., eardrum passes the sound waves to the small bones.

(d) Auditory nerve carries the vibrations converted into nerve impulses to the brain.

### **G. HOTS Questions:**

1. The speed of sound in air (340 m/s) is very much less than the speed of light in air ( $3 \times 10^8$  m/s). Due to this fact, we always see the lightning much before hearing the thunder.

2. There is no material medium (air) on the moon to propagate sound. Hence, we cannot hear any sound on the surface of moon.

3. We speak because of the vibrations in the vocal cords present inside the voice box. If there were no voice box, we would not be able to speak in such a manner.

4. (i)–(a), (ii)–(c), (iii)–(b), (iv)–(e), (v)–(d)

### **Passage/Case-based Questions**

1. Harmful effects of noise pollution include annoyance, aggression, hypertension, stress, hearing loss, sleep disturbance, etc.

2. Noise pollution can be reduced by controlling the number of vehicles on the roads, keeping the sound level of loudspeakers low and making strict laws to control noise pollution.

3. Listening to loud music is not good for health as it causes many problems. One can lose hearing ability due to high volume sounds.

### **H. Science Quiz/Puzzle:**

1. TRUMPET

2. INFRASOUND

3. DECIBEL

4. MEDIUM

5. AUDITORY

6. EARDRUM

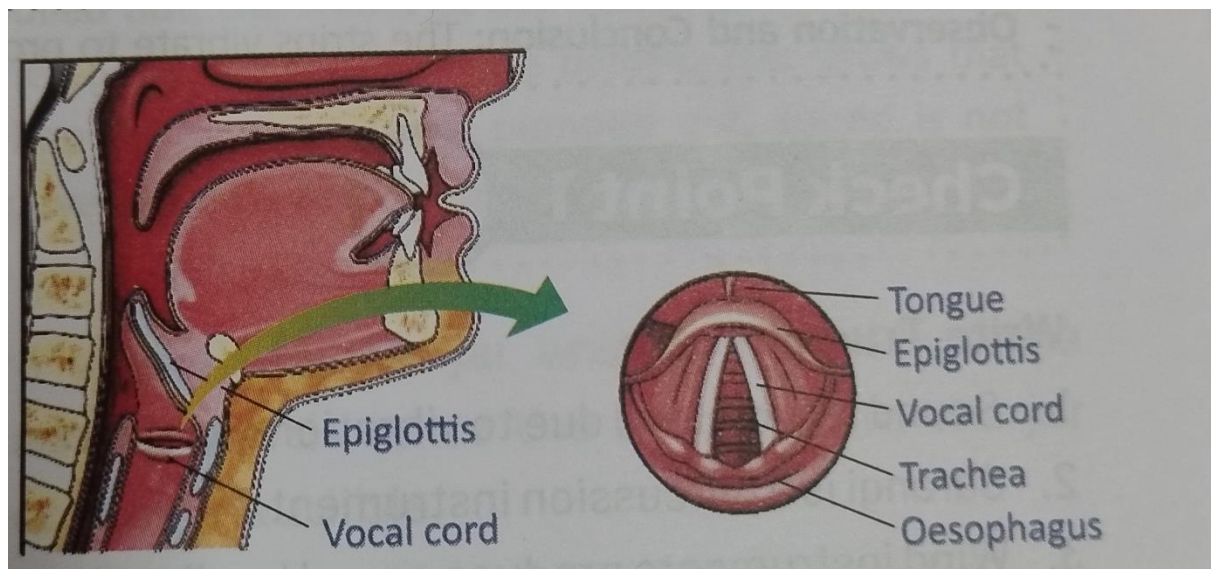
7. METRE

8. PITCH

### **Extra QUESTIONS:**

#### **Production of sound in humans:**

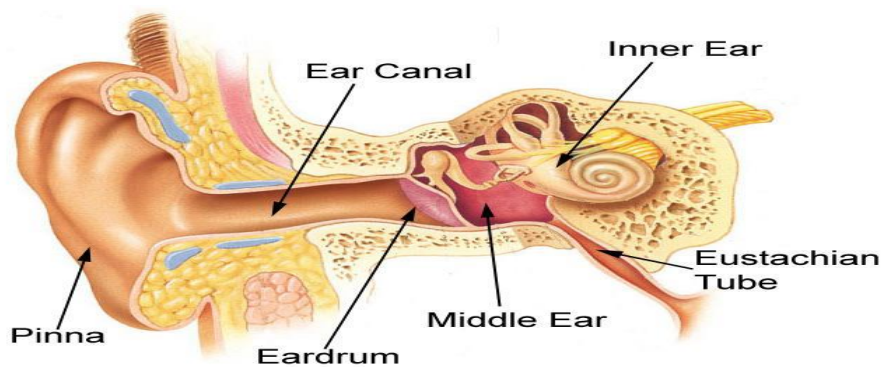
1. Human beings have a voice box or larynx which is present in their throat on the upper side of the windpipe.
2. The larynx has two vocal cords which have a narrow slit between them so that air can pass through it.
3. As the lungs throw the air out of the windpipe, it passes through the slit and hence allows the production of sound as the vocal cords start vibrating.
4. The vocal cord muscles also play a role in the production of sound.
5. Their thickness and tightness describe the quality or type of the voice a person has.
6. The vocal cords in males are of length 20 mm and females have 15mm long vocal cords. Children, on the other hand, have very short length vocal cords. Hence, the voices, their quality and their type are always different in women, men and children.



Human larynx (Voice box)

#### **Structure and working of human ear:**

- We know that sounds are produced as waves in the air or any other medium.
- As these sound waves travel to our ears they convert them into electrical signals or messages that our brain can understand.
- Our ears have a special structure that allows this function.
- There are three major parts of the human ear:
- **1. The outer ear (Pinna):** It catches the sound waves and forwards them to the next part of the ear, that is, the middle ear.
- **2. The middle ear:** It converts the sound waves into vibrations that then travel to the inner ear. It can do this with the help of the eardrum. The eardrum is a thin rubber-like sheet present in the Middle ear. As the sound waves reach the eardrum, it vibrates and these vibrations propagate to the inner ear.
- **3. The inner ear (cochlea):** It receives the vibrations sent by the eardrum. It contains a liquid substance and the vibrations that enter the inner ear moves through this liquid. There are tiny hairs present inside the inner ear that turn these vibrations into signals for the brain and pass them to the brain through the hearing nerve. As the brain receives the signal it interprets the sound. However, this whole process is so quick that we cannot notice it.



**Internal structure of human Ear**