

Chapter 7

Sound

LESSON PLAN

SPECIFIC OBJECTIVES

Students will learn about

- ❖ introduction to sound
- ❖ characteristics of a sound wave
- ❖ relation between wave speed, frequency and wavelength
- ❖ pitch of a sound
- ❖ pitch and frequency
- ❖ adjustment of pitch and frequency in musical instrument
- ❖ monotone
- ❖ loudness and factors affecting it
- ❖ loudness and waveform
- ❖ loudness also depends on the sensitivity of the listener
- ❖ unit of loudness – decibel

Teaching Aids

Pictures/models showing sound wave, different characteristics of sound; graphs showing high-pitched and low-pitched sound, soft and loud sound; pictures showing different types of musical instruments and tuning fork.

Teaching Strategy

- ❖ The teacher should teach the students about sound in brief.
- ❖ Students should be asked to study characteristics of a sound wave with definition and formula. They should also be asked to learn something more related to wavelength and brief introduction about H.R. Hertz given at page 113.
- ❖ Students should be encouraged to study the relation between wave speed, frequency and wavelength. They should also be asked to practice numerical problems related to it.
- ❖ The teacher should ask the students to solve check point 1 given at page 115.
- ❖ Students should be encouraged to study pitch of a sound; pitch and frequency. They should

be asked to perform activity 1 showing that the pitch of a sound increases with an increase in its frequency given at page 115. They should also be asked to learn low-pitched and high-pitched sound using illustration.

- ❖ Students should be asked to study adjustment of pitch and frequency in musical instrument, i.e., wind, stringed and membrane with examples. They should also be asked to perform activity 2 showing that pitch of sound increases on decreasing the length of air column given at page 116.
- ❖ Students should be asked to perform activity 3 and activity 4 related to stringed instruments given at page 117. They should also be asked to learn question-answer and something more related to membrane instrument given at page 118.
- ❖ The teacher should ask the students to study monotone, its related figure and matter given in the box. He/She should also ask the students to solve check point 2 given at page 119.
- ❖ Students should be asked to study loudness and the factors affecting it in detail. They should also be asked to perform activity 5 showing that loudness of sound increases with an increase in amplitude of vibrations.
- ❖ The teacher should ask the students to study loudness and waveform and related diagram of soft and loud sound; loudness depends on the sensitivity of the listener; unit of loudness and question-answer given at page 120. They should also be asked to learn Table 7.1 and Table 7.2 given at pages 120–121. They should also be asked to learn something more related to noise pollution due to loudness given at page 121.
- ❖ Students should be asked to perform activity 6 showing to design your musical instrument and study how its pitch and loudness may be changed given at page 121. They should also be asked to solve check point 3 given at page 121.
- ❖ Students should be asked to recap the chapter using wrapping it up and know these terms. They should also be asked to answer the questions given in test yourself and discuss the think zone given in it with other classmates.

Boost UP

- ❖ The teacher should call each student of the classroom one-by-one and ask to define sound and voice box. He/She should also ask each student to tell the speed of sound at room temperature.
- ❖ Students should be asked to define characteristics of a sound and to tell their SI units and related formulae. They should also be asked to establish the relation between wave speed, frequency and wavelength.
- ❖ The teacher should ask the students to define pitch of a sound. He/She should also ask the students to define frequency and to tell how they are related.
- ❖ Students should be asked to categorise the given few instruments into wind, stringed and membrane instruments. They should also be asked to define monotone and loudness. They should also be asked to tell the factors affecting loudness. They should also be asked to answer the few questions related to loudness and waveform, loudness depends on the sensitivity of the listener and unit of loudness.

Expected Learning Outcomes

Students will be able to know the

- ❖ brief introduction to sound.
- ❖ characteristics of a sound wave.
- ❖ relation between wave speed, frequency and wavelength.
- ❖ pitch of a sound.
- ❖ pitch and frequency.
- ❖ adjustment of pitch and frequency in musical instrument.
- ❖ monotone.
- ❖ loudness and factors affecting it.
- ❖ loudness and waveform.
- ❖ loudness also depends on the sensitivity of the listener.
- ❖ unit of loudness-decibel.

Evaluative Questions

The teacher should ask the following questions to evaluate the students.

1. Define sound.
2. Which is the speed of sound at room temperature?
3. What is the SI unit of time period?
4. Define pitch.
5. How are pitch and frequency related?
6. Name two wind instruments.
7. What is meant by monotone?
8. Name the degree of sensation produced in the ear by a sound.