

# Chapter 7. Sound: Production and Propagation of Sound

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**Solution 1:**

Yes, Sound is form of energy.

**Solution 2:**

Sound is produced by the vibrating objects.

**Solution 3:**

No, sound cannot travel through vacuum.

**Solution 4:**

Yes, sound can propagate through solids and liquids.

**Solution 5:**

No, sound cannot be produced in vacuum. It needs a material medium.

**Solution 6:**

Speed of sound depends on the density, pressure, temperature, humidity and Wind.

**Solution 7:**

330m/s is the value of speed in air at N.T.P

**Solution 8:**

In water, speed of sound is 4.5 times more than that in air. And, in iron, the speed of sound is 15 times as fast in air.

**Solution 9:**

The speed of sound is more in the humid air as compared to dry air. Because, the air moisture decreases the density of air and speed of sound is inversely proportional to density of air. So, sound travels faster in humid air.

**Solution 10:**

Speed of sound does not depend on the amplitude and wavelength.

**Solution 11:**

The sound produced by the moving wheels of the train travels faster on the iron track than in the air. So, firstly sound produced because of railway track is heard and then heard in the air.

**Solution 12:**

The waves in the air causes sound . Through waves , energy get transferred from one place to another and hence the sound.

**Solution 13:**

The ratio of speed of light to the speed of sound is  $9.1 \times 10^5$ .

**Solution 14:**

Speed of sound in air is independent of variation of pressure.

**Solution 15:**

The speed of sound in air increases with increase in temperature because with increase in temperature, the density of air gases decreases and speed of air is inversely proportional to density of air.

**Solution 16:**

The diver will hear the sound first because the sound travels faster in water than in air.

**Solution 17:**

The simple experiment that a person can do to calculate the speed of sound in air is that a person stands at a known distance ( $d$  meter) from the cliff and fires a pistol and simultaneously start the stop watch. He stops the stop-watch as soon as he hears a echo. The distance travelled by the sound during the time ( $t$ ) seconds is  $2d$ .  
So, speed of sound = distance travelled / time taken =  $2d/t$

**Solution 18:**

- **Moisture in Air:** The speed of sound increase with increase in humidity because the moisture in air decrease the density of air and speed of air is inversely proportional to density of air. Hence , the sound travels faster in moist air.
- **Pressure in air:** Speed of sound is independent of the air pressure.
- The speed of sound increases with the increase in temperature of the gas.

**Solution 19:**

The distance of flash from the observer = speed in air x time taken for the first sound to reach  $330 \times 6 = 1980\text{m}$

**Solution 20:**

Distance between boys = speed of sound x time taken to reach sound =  $330 \times 2.5 = 825\text{m}$