PHYSICS GRADE 7
UNIT 7 SUMMARY

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MAY 2020

UNIT 7
SOUND (THE 4TH LESSON)

INTRODUCTION

- One of the most commonly observed phenomenon in nature is sound.
- You hear different sounds throughout the day, The sound of car, barking of dog , friends chatting , a teacher taking and music are some examples of sound .
- Students, Have you ever tried to play a guitar or kirar ? When you strike each string , it starts to vibrate and as the result you hear musical sound.

- The vibrations travels away from each strings as a wave . This wave is called sound wave .
- Sound is a form of wave . If your ears are in the path of sound wave , then you will hear the sound by your ears .
- Our ears are designed by nature to pick up sound transmitted through different material .

DEFINITION OF SOUND

- Sound is a form of energy. It is generated by series of vibration of an object.
- Every sources of sound are in a state of vibration.

PRODUCTION OF SOUND

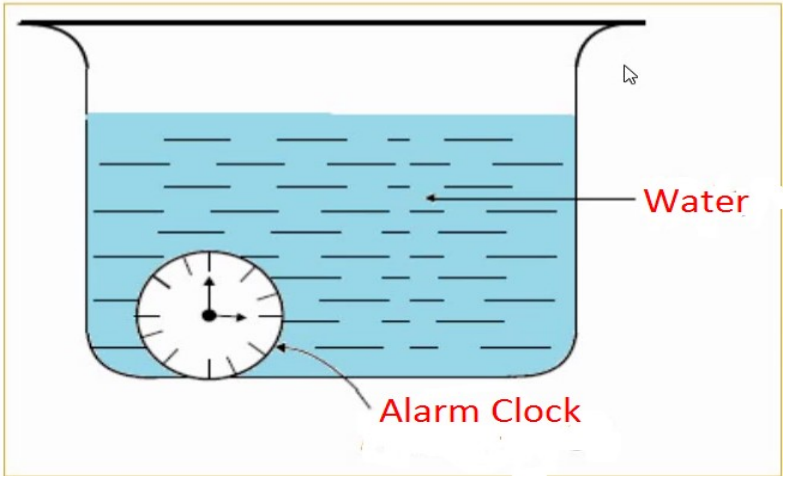
- All sounds are produced by a vibrating objects.
- The produced sound travels in every direction in the form of energy and reaches your ear.

Example : The bell’s sound in your school is heard any where around the bell in

TRANSMISSION OF SOUND

- Sound need material medium for transmission .
- The material through which the sound traveled and reached to your ears is called **medium**.
- **Solid, liquid, and gaseous** bodies transmit sound through them .

SHOWING TRANSMISSION OF SOUND THROUGH LIQUID



- To observe how sound travels in a liquid , take an alarm clock and place it at the bottom of a bowl of water.
- Press the alarm clock with your finger and listen to the sound of clock from outside.

CONTINUED….

- All materials can transmit sound . But the degree of transmission is not the same for all materials.
- Solids are better transmitters of sound than liquids and air (gases).
- Sound needs material medium for its transmission . It can not travel through a vacuum.

BELL- JAR EXPERIMENT



- There is air inside the bell jar so the sound can travel and be heard.

CONTINUED....



VACUUM
PUMP On

- By pumping the air using vacuum pump there is no air in the jar.
- You can not hear the sound of the clock.

SPEED OF SOUND IN DIFFERENT MEDIA

SPEED OF SOUND IN AIR

- During a thunderstorm you may see a distant lightning flash some seconds before you hear the thunder . This suggests that the speed of sound in air is much less than the speed of light.
- The speed of sound in air is about 331 m/s at 0°c.
- The speed of sound increases by 0.6 m/s for every degree Celsius increase in temperature .
- The speed of sound in air at any temperature

() can be calculated as :

=+

- EXAMPLE 1

What is the speed of sound in air at 30°c ?

Given

T = 30°C

x 30°c

= 331 m/s + 18m/s

= 349m/s

Solution

=+

= 331m/s + 0.6/ 1°c

Example 2

A thunder was heard 4 s later after the lightning is seen . If the distance of the lightning is 1396 m away from the observer what is the speed of sound at that temperature?

Given

t= 4s

s=1396m

1396m/4s

349 m/s

Required

v= ?

Solution

s= vt

v= s/t

v =

v =

SPEED SOUND IN VARIOUS SUBSTANCE

- Speed sound in the liquids and solids is not affected significantly by the change in the temperature , but is affected by their body structure.
- The transmission of sound in different substances depends on the structure of the particles in the substances.
- The speed of sound in water is greater than the speed in air and its speed in steel is the greatest of water and air.

- The speed of sound in different material is given in the following table

Speed sound in various substance at 0°C

substance	Speed (m/s) 0°
Gases	
oxygen	316
Air	331
liquids	
ethanol	1150
mercury	1438
water(distilled)	1410
sea water	1450
Solids	
lead	1948
copper	4998
glass	5628
steel	5948

SUMMARY OF THE DAILY LESSON

- Definition of sound
- PRODUCTION OF SOUND
- TRANSMISSION OF SOUND
- SPEED OF SOUND IN DIFFERENT MEDIA

HOME WORK

1. What is sound ?
2. How is sound energy produced and transmitted ?
3. What is the speed of sound in air at **40c⁰ ?**