

CLASS: IX

TOPIC: SOUND

Pre-Content/content Post-Content	Learning outcomes/Objectives	
	General	Specific
<u>Pre-Content</u> Mechanical and electromagnetic waves, transverse and longitudinal waves, , sound needs a medium to propagate , Propagation of sound wave, compression and rarefaction, crest, trough, factors affecting speed of sound, characteristics of sound wave. <u>Content</u> Reflection of sound wave, applications of reflection of sound, echo, reverberation, ultrasound and infrasound, audible range, applications of ultrasound, human ear. <u>Post Content</u> Conceptual on applications of reflection of sound and ultrasound.	Students will be able to: study reflection of sound in detail. Comprehend the concept of Echo , multiple reflections, apply the reflection of ultrasonic waves in day-to-day life. -describe human ear in detail.	Students will be able to: verify laws of reflection of sound experimentally. list applications and uses of reflection of sound. categorise sound as audible, infra sound and ultra sound based on the frequency. perform an activity to comprehend echo. differentiate between echo and reverberation. list ways of reducing reverberation. list applications of ultrasound wave. describe the method of echo ranging. explain working of SONAR solve numericals on the formula for echo ranging. explain structure and functioning of human ear.

Home Work /Assignments

NCERT questions will be discussed in the class and can be given as home task

Worksheets can be prepared and discussed in the class..

Teacher's Activity	Student's Activity	Teacher's observation and Remedial
Teacher will demonstrate the experiment to verify the laws of reflection for sound wave in laboratory using metallic pipes and reflector. quote examples from daily life on applications of reflection of sound. <u>Annexure 12(A)</u> demonstrate an activity to find the speed of the sound in air using the concept of Echo. explain how sound is produced using vibrations. Discuss the concept of pitch of a vibrating body . This varies inversely with length. explain the echo ranging method and explain working of SONAR. explain the working of human ear and provide students with the challenging numerical problems and conceptual problems from the NCERT book and worksheet booklet.	Students will : perform the experiment to verify the laws of reflection for sound wave. comprehend and list uses and application of reflection of sound. <u>Annexure 12(a)</u> perform the activity in the school auditorium and record the observations. -comprehend the concept and complete the worksheet given in the class . -comprehend the working of SONAR and list its uses. -draw the human ear and analyse the function of each and every part of the human ear. solve the questions by applying concepts and formulae.	

Teaching Aids: NCERT, Internet access, activity kits.

Methodology/Innovative: Discussion, Hands on activity, demonstration method .

Interdisciplinary Links: Mathematics, English, Navigation, Biology.

HOD

Coordinator

Vice-Principal

Principal

Annexure 12 (A) , (a)- An echo echoes!!

Subject	Science
Class	IX
Chapter/Unit	Chapter -12, Sound
Topic	To calculate the speed of sound in air using the concept of Echo
Time	20 Min
Nature of Activity	Pair work

What will I learn (Learning Outcome)?

To find the speed of the sound in air using the concept of Echo.

Skills: Analyzing and Creating

What I have to do?

To demonstrate an activity to find the speed of sound using the auditorium/a big room of your school

What do I require?

A big room / auditorium, paper and measuring tape.

What do I need to know?

For an echo to be heard, the distance between the sound source and the reflecting surface must be more than 17 meter, so that the time period between hearing the original sound and its **echo** is at least 0.1 of a second(persistence of hearing)

➤ Teacher's Activity

Teacher will :

1. discuss the conditions for echo to be heard.
2. will explain the steps of the activity.
3. make pairs and ensure that each participant in the pair performs the activity .

How will I proceed?

➤ Students activity

1. Student A will stand in a class room and clap and another student B will record how many times the sound of clap was heard by him.
2. Now both the students will measure the length of the auditorium/ a big room in the school.
3. Student A will stand at one corner of the auditorium/ big room and clap. Student B will record how many times the sound of clap was heard by him.

What have I observed?

Length of the auditorium/big room =

S.No	Location of the student when making a sound	Echo heard - Yes or No
1.	In a class room	
2.	In an auditorium	

What have I learnt?

Echo is heard if the minimum distance between the source of sound and the obstacle is _____ meter.

What am I curious to learn?

- Measure the time after which echo is heard and hence calculate the speed of sound in air (using the formula $v = 2d/t$).

Let me evaluate myself

Q.1. What do you understand by echo?

Q.2. Explain why an echo is not produced in a small room?

Q.3. If the echo tube is filled with water, will the echo be heard ?Discuss. Given that the speed of sound in water is 1532 m/s, find out the minimum length of tube (filled with water) which can produce an echo.

Q.4.Explain SONAR as an application of echo.

Q.5.A wave passes from one medium to another medium. Mention one property of the wave out of speed, frequency or wavelength (a) which changes, (b)which does not change.
