

CLASS – IX
LESSON PLAN
CH- 12 SOUND

Unit	Physics (Chapter 12: Sound)
Class Transaction	Total: 10 periods (approx. 40 min each)
Pre-requisite for the course	This lesson requires 1. Basic knowledge of sound energy, medium 2. Basic knowledge of pendulum, vibration.
Assessment of qualifying knowledge	1. Written test 2. Lab activity 3. Group Discussion 4. HW notebook
Objective	Given the content (chapter) the students will be able to Explain how sound is produced and propagated, characteristic of sound waves, mechanical waves, ultrasound and its application, infrasound, understand echo and reverberation, understand the working of SONAR and its applications, working of human ear.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> Students will be able to • Discuss the importance of sound energy • Appreciate the need of ultrasonic waves in our daily life. • Aware of how is sound produced and propagated <u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i> • Critically analyse how sound is produced and propagated around us • Appreciate the importance of ultrasonic waves in our daily life. • collaboratively • Perform group activities to learn about the characteristics of sound wave Built character amongst themselves by discussing /communicating about the people who have hearing impairment/ deaf people • Answer knowledge, understanding, application and diagrammatic skill based questions based on the topic. Attitudes and beliefs- <i>Students will be able to</i> Develop citizenship by visualizing and observing the given scenario in day to day lives and present it in form of a skit to sensitize others
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Active learning- <i>Filling up of observation sheet based on experiments</i>- (Critical thinking) Group learning- The class will be divided in the group of 5 students. <i>Circle the Sage</i>- The question will be asked by the teacher about how is sound produced when we speak and it reaches to the other person.(Communication, Collaboration) Differentiation- activities will be performed in heterogeneous groups Questioning- <i>Multiple level question</i>- Teacher will prepare a list of question about the conservation of water resources and will ask these questions during discussions. (Critical thinking, Communication) <i>Brain Storming</i>-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic</i>- PPT and Digital Content would be shared

	<i>Guided practice followed by Independent Practice</i>- NCERT questions to be discussed in the classroom. Techniques to be used: Quiz Daily Practice Problem MCQ Peer Assessment Student -teacher interaction, Wipro- G.O.s(web chart, flow chart and differentiation table,compare- contrast matrix), collaborative learning, Research work/surveys
Resources	Text Book: NCERT text book for Science. Reference Book 1. CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the monthly planner by which we can assess their critical thinking and creativity HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 marks On time submission.....1 mark Presentation/ Neatness(creativity).....1 mark Content(critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessments	4 UNIT TESTS (20, 20,20, 20).....80 Marks HALF YEARLY EXAMINATION.....80 Marks ANNUAL EXAMINATION.....80 Marks PERIODIC TEST-By administering pen paper test we assess creativity and critical thinking. Half Yearly and Annual examination= Total of 80 marks each INTERNAL ASSESSMENT=20 Marks as follows (to be added at the end of the term) :- - Periodic Test (Unit Test) 10 Marks By administering pen paper test we assess creativity and critical thinking. - Subject Enrichment 05 Marks PPT on daily life applications of reflection of sound (research skill) - Note Book Submission 05 Marks
Addressing Classroom Diversity	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups: <i>For gifted students:</i> - Encouragement for referring other resources <i>For weak students:</i> - Buddy help to be provided - Provide grade-up classes <i>For differently abled students:</i> - Ignore spelling mistakes. - Call parents at regular intervals

	• Provide grade-up classes
Marks	The weightage would be given by CBSE. 1. How is sound produced? Explain with the help of an activity 2. Define the following characteristics of the sound wave (i) Wavelength (ii) Frequency (iii) Time period 3. The Delhi-C station of All-India Radio transmits music at 219 m wavelength and 1370 kHz frequency. Calculate the velocity of radio waves. 4. List three applications of ultrasonic waves in daily life. 5. What is Sonar? A ship sends a sound wave to the bottom of the sea and receives an echo after 0.3 sec. assume speed of sound in water to be 1500m/s. calculate the depth of the sea.

Unit	PHYSICS (CH- 12 Sound)
Topic/sub-topic	Day 1 (Production of sound)
Class Transaction	Total: 10 periods (approx. 40 min each)
Pre-requisite for the course	This lesson requires • Basic knowledge of vibration • Basic different sounds we hear in our day to day life
Assessment of qualifying knowledge	5. Lab activity 6. Group Discussion 7. HW notebook
Objective	Students will be able to • Define Sound with examples • Explain production of sound with the help of vibration
DOL	D1,2,3,4,
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> Students will be able to • Sound is produced when there is vibration • <u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i> • Critically analyse that all sounds are accompanied by vibration • Cite examples (communication)
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Group activity followed by filling of observation sheet Take a tuning fork and set it vibrating by striking its prong on a rubber pad. Bring it near your ear. Do you hear any sound? Touch one of the prongs of the vibrating tuning fork with your finger and share your experience with your friends. Now, suspend a table tennis ball or a small plastic ball by a thread from a support [Take a big needle and a thread, put a knot at one end of the thread, and then with the help of the needle pass the thread through the ball]. Touch the ball gently with the prong of a vibrating tuning fork Active learning- <i>Rally robin</i> (Critical thinking) Introduction of the topic by the teacher Questioning- <i>Multiple level question</i>- Teacher will prepare a list of questions based on the activity and will ask these questions during discussions. (Critical thinking, Communication) <i>Brain Storming</i>-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would

	also be told the significance of the topic that they would be studying. <i>Introduction of the topic-</i> PPT and Digital Content would be shared <i>Guided practice followed by Independent Practice-</i> NCERT questions to be discussed in the classroom. Techniques to be used: Quiz Daily Practice Problem MCQ Peer Assessment Student -teacher interaction, Wipro- G.O.s(web chart, flow chart and differentiation table, compare- contrast matrix), collaborative learning, Research work/surveys
Resources	Text Book: NCERT text book for Science. Reference Book 2. CBSE Exemplar
Closure	One minute paper- what was the most important thing they learnt, what they liked , importance of the concept in our daily life
Self Study, Home Work, Assignments	What do you understand by vibration? Give two examples to justify that vibration leads to production of sound.

Topic	DAY 2- Propagation of Sound
Class Transaction	40 min
Pre-requisite for the course	This topic requires knowledge of production of sound
Assessment of qualifying knowledge	One sentence summary on how sound is produced
Objective	Student will be able to • Explain the propagation of sound • Draw difference between production and propagation
DOL	D1,2,3
Learning Outcomes	<u>KNOWLEDGE-</u> <i>Students will know and understand</i> • How sound reaches from one point to the other • Explain that sound is a mechanical wave <u>SKILLS AND COMPETENCIES-</u> <i>Students would be able to</i> • Critically analyse <i>that sound is a mechanical wave</i> • Explain the how sound is propagated (communication)
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- • The students will be divided into 5 groups. • Each group will be asked to Make a list of different types of musical instruments and discuss with your friends which part of the instrument vibrates to produce sound • The students will then draw out the conclusion as to how sound travels in a medium (Collaboration and critical thinking) <i>Guided practice followed by Independent Practice-</i> NCERT questions to be discussed in the classroom. Techniques to be used:

	Quiz Daily Practice Problem MCQ Peer Assessment Student -teacher interaction, Wipro- G.O.s(web chart, flow chart and differentiation table,compare- contrast matrix), collaborative learning, Research work/surveys
Resources	Text Book: NCERT text book for Science. Reference Book CBSE Exemplar
Closure	Involving students in summarizing by asking them to prepare questions based on the topic.
Self Study, Home Work, Assignments	How is sound produced and propagated by your school bell

Topic	DAY 3 – Sound needs a medium to travel
Class Transaction	40 min
Pre-requisite for the course	This topic requires basic knowledge sound, vibration, production and propagation of sound.
Assessment of qualifying knowledge	One minute paper-How does the sound produced by a vibrating object in a medium reach your ear?
Objective	Given the content (topic) the students will be able to understand that sound is a mechanical wave.
DOL	D1,2,3,4
Learning Outcomes	<u>KNOWLEDGE</u> - <i>Students will know and understand</i> Students will be able to • Explain sound a mechanical wave <u>SKILLS AND COMPETENCIES</u> - <i>Students would be able to</i> • Experimentally prove that sound is a mechanical wave (critical thinking)
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Experiential learning- bell jar experiment Group learning- The class will be divided in the group of 5 students and perform the activity as follows and fill in their observations in the problem sheet. (Communication, Collaboration) Techniques to be used: Quiz Daily Practice Problem Student -teacher interaction, collaborative learning, Research work/surveys
Resources	Text Book: NCERT text book for Science. Reference Book CBSE Exemplar
Closure	One sentence summary- why sound waves are called mechanical waves?

Topic	DAY 4 (Characteristics of a sound wave)
Class Transaction	approx. 40 min each

Pre-requisite for the course	This topic requires Basic knowledge sound, vibration, production and propagation of sound.
Assessment of qualifying knowledge	QUIZ
Objective	Students will be able to explain the different characteristics of a sound wave
DOL	D1,2,3,4,
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> Students will be able to - Define frequency, amplitude, speed and derive a relation between them <u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i> - Represent sound wave graphically and explain its characteristics (creativity and communication)
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- <i>Brain Storming</i>-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. (critical thinking and communication) <i>Introduction of the topic</i>- PPT and Digital Content would be shared Students will then draw a sound wave and label the terms learned. <i>Guided practice followed by Independent Practice</i>- NCERT questions to be discussed in the classroom. Techniques to be used: Quiz Daily Practice Problem Questioning Student -teacher interaction, silent/ loud reading, collaborative learning,
Resources	Text Book: NCERT text book for Science. Reference Book CBSE Exemplar
Closure	On the basis of your understanding draw wave shape for high and low pitch sound, and soft and loud sound. Which characteristic varies in each case.
Self Study, Home Work, Assignments	Ncert Questions

Topic	DAY 5 (speed of sound in different media)
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This topic requires Basic knowledge sound, vibration, production and propagation of sound, characteristics of sound wave.
Assessment of qualifying knowledge	Derive relation between speed, wavelength & frequency, followed by a numerical
Objective	Sound travels with different speed in different media.
DOL	D1,2,3
Learning Outcomes	<u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i> Answer knowledge, understanding, application based questions based on the topic(critical thinking)

Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Group learning- students will be divided in groups and will be asked to observe table 12.1. they will then discuss and fill the observation sheet. Active learning- Circle the sage- few reasoning question will be asked by the teacher and this strategy will be followed. (Critical thinking and collaboration) Based on their observation they will fill the observation sheet and each group will draw conclusion and explain (communication) Techniques to be used: Daily Practice Problem MCQ Student -teacher interaction, Wipro- G.O.s(web chart, flow chart and differentiation table,compare- contrast matrix), collaborative learning,
Resources	Text Book: NCERT text book for Science. Reference Book CBSE Exemplar
Closure	Cognitive closure- In which of the three media, air, water or iron, does sound travel the fastest at a particular temperature?
Self Study, Home Work, Assignments	Independent Practice: link of video followed by questions

Topic	DAY 6 (Reflection of sound)
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	Basic knowledge of reflection
Assessment of qualifying knowledge	one minute paper- what do you understand by the term reflection
Objective	Laws of reflection of sound and its applications
DOL	D1,2,3,4
Learning Outcomes	<u>KNOWLEDGE</u> - <i>Students will know and understand</i> Students will be able to • Explain the reflection of sound. • Differentiate between echo and reverberation <u>SKILLS AND COMPETENCIES</u> - <i>Students would be able to</i> • Apply the reflection of sound in day to day life (critical thinking)
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Active learning- lab activity (Critical thinking and collaboration) They will then discuss the answer of following questions Teacher will then explain the concept. Techniques to be used: Daily Practice Problem MCQ Student -teacher interaction, Wipro- G.O.s(web chart, flow chart and differentiation table,compare- contrast matrix), collaborative learning,
Resources	Text Book: NCERT text book for Science. Reference Book CBSE Exemplar

Closure	Cognitive closure- summarization by students,-echo and reverberation
Self Study, Home Work, Assignments	Numericals based on echo and reverberation

Topic	DAY 7(uses of multiple reflection of sound and range of hearing)
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	Reflection of sound, laws of reflection
Assessment of qualifying knowledge	Give one get one- based on the learnings of previous class students will revise by this strategy.
Objective	Give daily life examples of multiple reflection of sound
DOL	D1,2,3
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> Students will be able to - Reflection of sound and its daily applications <u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i> - Critically analyse why do certain objects float or sink in liquids (Critical thinking and problem solving)
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Students will then be divided into groups of 5. Each heterogeneous group will see the image and try to conclude how is it related to reflection of sound.(Critical thinking and collaboration) Teacher will then also explain range of hearing. Techniques to be used: Daily Practice Problem MCQ Student -teacher interaction, Wipro- G.O.s(web chart, flow chart and differentiation table, compare- contrast matrix), collaborative learning,
Resources	Text Book: NCERT text book for Science. Reference Book CBSE Exemplar
Closure	Cognitive closure- summarization by students
Self Study, Home Work, Assignments	Link of video followed by set of questions

Topic	DAY 8 (Applications of ultrasound)
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This lesson requires basic knowledge of ultrasound and infrasound frequencies
Assessment of qualifying knowledge	One minute paper- What is the range of frequencies associated with (a) Infrasound? (b) Ultrasound?
Objective	Daily life applications of ultrasound
DOL	D1,2,3,4
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> Students will be able to - List Daily life applications of ultrasound <u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i> - Critically analyse day to day life applications of ultrasound.

Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Students will then be divided into groups of 5. Each heterogeneous group will jot down five important points from the digital content (each group will be assigned different topics) shown in the class. Presentation by each group (Critical thinking and collaboration). Techniques to be used: Daily Practice Problem MCQ Student -teacher interaction, Wipro- G.O.s(web chart, flow chart and differentiation table, compare- contrast matrix), collaborative learning,
Resources	Text Book: NCERT text book for Science. Reference Book CBSE Exemplar
Closure	Cognitive closure

Topic	DAY 9 (Sonar)
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This lesson requires basic knowledge of ultrasonic waves, reflection of sound
Assessment of qualifying knowledg	Group Discussion HW notebook
Objective	Sonar and its working
DOL	D1,2,3,4
Learning Outcomes	<u>KNOWLEDGE</u> - <i>Students will know and understand</i> Students will be able to • Explain what is sonar and its working • Derive formula for echo ranging <u>SKILLS AND COMPETENCIES</u> - <i>Students would be able to</i> • Sonar, working, critically analyse its applications
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Students will then be divided into groups of 5. Each heterogeneous group will write their observation in the observation sheet- based on the video(Critical thinking and collaboration) Each group will solve a numerical based on sonar Techniques to be used: Daily Practice Problem MCQ Student -teacher interaction, Wipro- G.O.s(web chart, flow chart and differentiation table, compare- contrast matrix), collaborative learning,
Resources	Text Book: NCERT text book for Science. Reference Book CBSE Exemplar
Closure	Cognitive closure- what is echo ranging and its uses?
Self Study, Home Work, Assignments	Ncert questions

Topic	DAY 10 (Structure of human ear)
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	Basic knowledge of how sound is produced, vibration
Assessment of qualifying knowledge	one minute paper- how is sound produced
Objective	Structure of human ear and how we hear sound.
DOL	D1,2,3,4
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> Students will be able to Draw the diagram of human ear and explain how sound is heard. <u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i> • Creatively draw human ear and explain how sound is produced and heard. (creativity and communication)
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Digital content followed by independent work by students On the basis of digital content summarization in their own words. Techniques to be used: Daily Practice Problem MCQ Student -teacher interaction, Wipro- G.O.s(web chart, flow chart and differentiation table,compare- contrast matrix), collaborative learning,
Resources	Text Book: NCERT text book for Science. Reference Book CBSE Exemplar
Closure	Cognitive closure- summarization by students