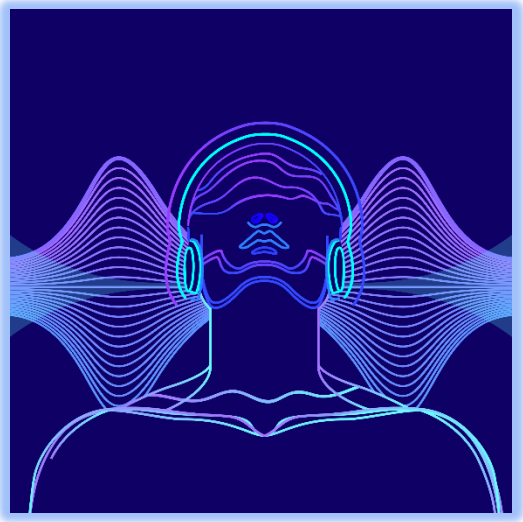
Sound:

Sound is a form of energy that we can hear. It travels through the air (or other materials) and reaches our ears, which allows us to hear different noises.

Students' Learning Outcomes

Describe and demonstrate how sound is produced by a vibrating body.



How sound is produced?

- Sound is produced by a vibrating objects and travels in the form of waves.
- When something vibrates, it moves back and forth very quickly.
- The air around the vibrating object also vibrates.
- This movement pushes and pulls the air around it.
- These pushes and pulls create sound waves.

Short Questions

1. What is sound?
2. How sound is produced?

- Some sounds are pleasant, such as chirping of birds.
- While others are unpleasant, such as traffic horns.
- Sound is best source of communication.
- We can understand the word spoken in different languages.
- Sound is also a source of entertainment.

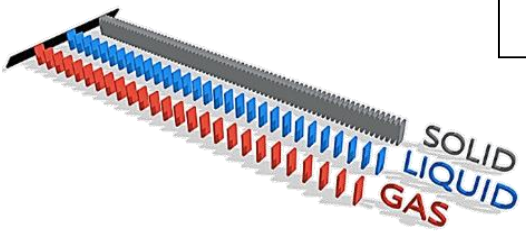
Propagation of sound:

Sound can travel in the form of waves, through material medium such as solids, liquids and gases. Sound cannot travel through vacuum. Because vacuum contains no particles or molecules to travel through.

Students' Learning Outcomes

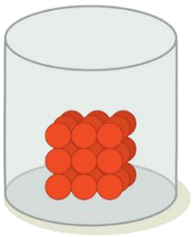
Identify variety of materials through which sound can travel.

Identify speed of sound differs in solids, liquids and gaseous medium.



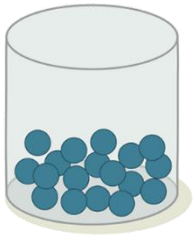
Speed of sound:

Speed of sound varies in different mediums.



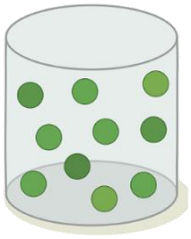
Through solids: Sound travels fastest trough solids because molecules of solids are tightly packed together as compared to liquids and gases.

Speed of sound in iron = 5000 m/s



Through liquids: Sound travels faster in liquids than gases but slower than solids. Because molecules in liquids are more closely packed in liquids but less than solids.

Speed of sound in water = 1500 m/s



Through gases: Speed of sound in gases is slower because molecules are not tightly packed. The

Speed of sound in air = 343 m/s

Short Questions

3. In which medium sound travels fastest?
4. What is the speed of sound in iron?
5. Can sound travel in vacuum?
6. Why sound travels slowest through gases?

Exercise based short question

How can you compare the speed of light and speed of sound coming from lightning?

Answer: when light strike, light appears first. While sound of lightning is heard a few moments later. Therefore the speed of light is more as compared to the speed of sound.

Intensity of sound:

Sound intensity is a way to describe how strong or loud a sound is.

Unit: Intensity of a sound is measured in **"decibels**" (dB). Decibels tell us how loud or soft a sound is.

It tells us how much energy a sound wave carries as it travels through the air (or other materials).

Loud Sounds:

Loud sounds have high intensity. They are strong and can be heard easily even from a distance.

- For example, hitting a drum, a plane taking off etc.

Soft Sounds:

Soft sounds have low intensity. They are gentle and we need to be close to hear them clearly.

- For example, whispering or rustling leaves etc.

Factors affecting intensity:

Intensity of sound depends upon two factors:

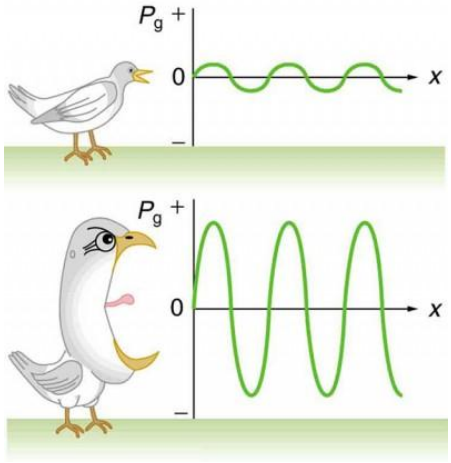
1. Amplitude of sound waves.
2. Distance between listener and sound producing object.

Short Questions

7. Define intensity of sound. Also write its units.
8. What is the effects of intensity on loudness?
9. On which factors does intensity depends upon.

Amplitude:

Amplitude tells us how high or low the sound wave is i.e the size of sound waves.



- ❖ The greater the amplitude, the greater will be the energy in sound waves.
- ❖ The lower the amplitude, the lower will be the energy in sound waves.

Distance between listener and sound producing object:

The greater the distance between listener and sound producing object, the lower will be the sound. Because sound waves become weak with the increase in distance. That's why whispering of our friends cannot be heard by the other persons.

Some other examples:

Very Loud Sounds: For example, a rock concert or a jet engine can be around 100-120 dB. These sounds are very intense and can sometimes hurt our ears if they are too loud.

Moderate Sounds: Normal conversation is around 60-70 dB. This is comfortable and easy to hear without straining.

Soft Sounds: A quiet library or a soft whisper might be around 30-40 dB. These sounds are gentle and you have to listen carefully to hear them.

Exercise based short question

When train is moving away from you, will the intensity of its sound increase or decrease?

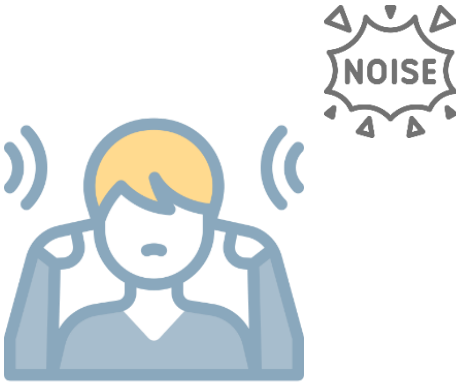
Answer: If the train is moving away from us, the intensity of sound will decrease because distance is increasing.

Noise:

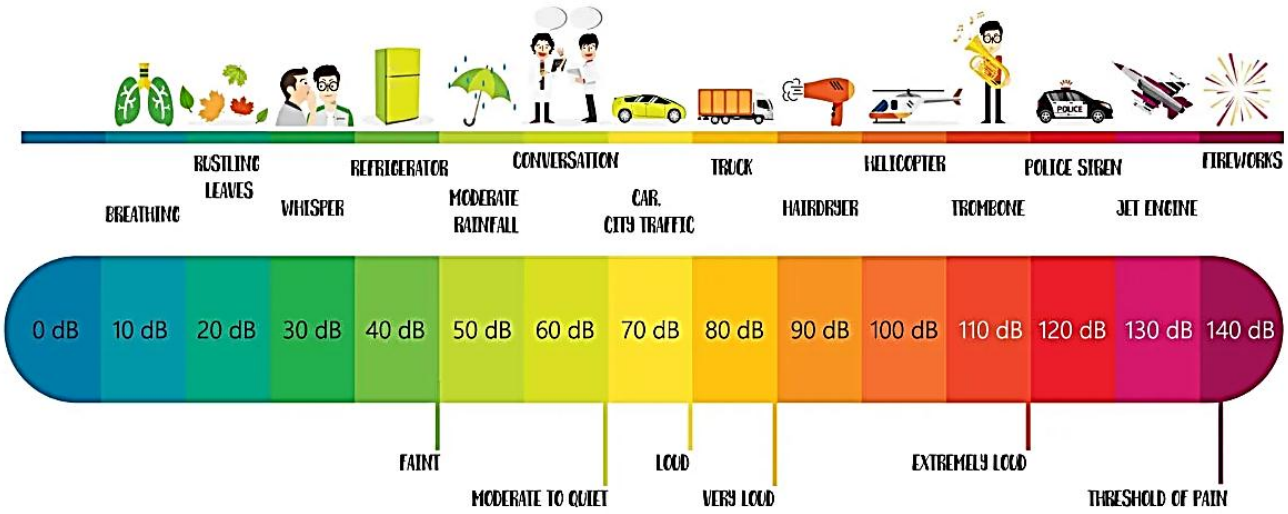
Students' Learning Outcomes
Define noise and its harmful effects on human health.

Noise is any kind of unpleasant sound that is loud, annoying, or unwanted. It can come from many sources, like:

- Traffic
- Loud music
- Machinery



Unlike pleasant sounds, noise can be bothersome or disturbing. Sounds that are in red zone are considered as noise.



Short Questions

11. Define unpleasant sound or noise.
12. Give any four harmful effects of noise on human health?

Short Questions

10. Define pleasant sounds.

Pleasant sounds are sounds that make us feel happy and does not irritate our ears. For example, chirping of birds.

Harmful effects of noise on human health

Noise can affect our health in several ways, especially if it is loud or constant. For example:

Damage hearing like hear loss

Disturb sleep cycle

Heart problems like high blood pressure

Stress problems

Communication problems due to loud sounds

Role of human beings in reducing noise pollution:

Human beings play an important role in reducing noise pollution by adopting some very simple habits. Such as:

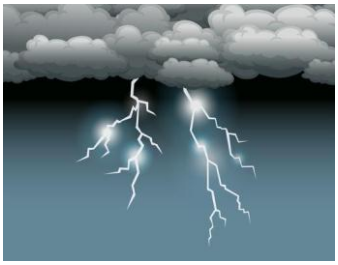
Students' Learning Outcomes

Appreciate the role of human beings in reducing noise pollution.

Short Questions

13. What is the role of human beings to control noise?

- Unwanted use of horns should be banned near schools, hospitals, libraries, homes etc.
- Use of loud speakers should be controlled.
- Bus stands, airports and factories should be away from homes.
- Vehicles, motors and machines should be maintained regularly.
- We should increase plantation to reduce noise.
- We should lower music volume while listening on speaker.
- People working in industrial areas should wear ear plug or ear muffs or noise helmets to avoid noise.

Mark ✓ for pleasant sounds and mark ✕ for unpleasant sounds in the given pictures.		
		
✓	✕	✓
 		
✕	✓	✕

1. Speed of sound is maximum in:			
a. A metal wire	b. Air	c. Water	d. Vacuum
Reason: *Sound travels fastest through solids due to their dense molecular structure.*			
2. Which of the following sound is called noise?			
a. Sound of a flute	b. Rustling of leaves	c. Pressure horn	d. Chirping of birds
Reason: *A pressure horn produces harsh, irregular sound waves.*			
3. When water comes in the way of sound travelling through air:			
a. Sound will stop.	b. Sound will slow down	c. Sound will become fast	d. No effect on the speed of sound.
Reason: *Water will slow sound waves as it is denser than air.*			
4. Sound passes through:			
a. Liquid	b. Solid	c. Gas	d. All of these
Reason: *Sound can travel through solids, liquids, and gases.*			
5. Sound cannot pass through:			
a. Solid	b. Liquid	c. Gas	d. Vacuum
Reason: *Sound requires a medium; vacuum lacks one.*			
6. Speed of sound in water is:			
a. 500 m/s	b. 1000 m/s	c. 1500 m/s	d. 2000 m/s
Reason: *Sound travels faster in water than in air due to higher density and elasticity.*			
7. The intensity of sound _____ with the increase of distance from the source of sound.			

a. Increases	b. Decreases	c. Remains same	d. Becomes 4 times
Reason: *Intensity decreases with distance due to the spreading of sound waves.*			
8. Intensity of sound depends upon:			
a. Distance	b. Light	c. Temperature	d. Pressure
Reason: *Intensity is influenced by how far sound travels.*			
9. The voice of Sara will be more clear to Sonia, if the distance between them is:			
a. Five meters	b. Ten meters	c. Fifteen meters	d. Twenty meters
Reason: *Shorter distances result in clearer sound due to less spreading and attenuation.*			
10. Noise can be controlled by:			
a. Deforestation	b. Use of horns	c. Plantation	d. Construction
Reason: *Planting trees can absorb and block sound waves, reducing noise.*			
11. Which of the following is the cause of fatigue and anxiety?			
a. Rain	b. Light	c. Noise	d. Air
Reason: *Loud or persistent noise can lead to stress, fatigue, and anxiety*			
12. Speed of sound in air is:			
a. 140 m/s	b. 240 m/s	c. 340 m/s	d. 440 m/s
Reason: *At room temperature, the speed of sound in air is approximately 340 meters per second.*			
13. Buzzing of flies and mosquitoes is due to _____ of their wings			
a. Heating	b. Vibration	c. Rotation	d. Sleeping
Reason: *The sound produced by insects like flies and mosquitoes is due to the rapid vibration of their wings.*			

14. Some sounds are harsh and irritant, they are called:

a. Pleasant sounds	b. Unpleasant sounds	c. High sounds	d. Loud sounds

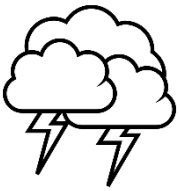
Reason: *Unpleasant sounds are those that are harsh or annoying to hear.*

15. In which medium does sound travel fastest?

a. Air	b. Water	c. Iron	d. Vacuum

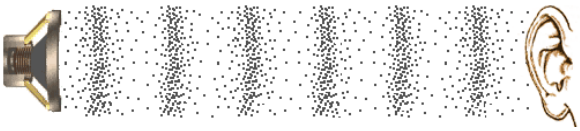
Reason: *Sound travels fastest in solids like iron compared to liquids (like water) and gases (like air),*

16. Which of the following has greater intensity of light?

a. 	b. 	c. 	d. 

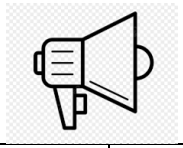
Reason: *Thundering of light has highest intensity.*

17. Identify the medium is which sound is travelling?



a. Water	b. Air	c. Solid	d. Vacuum

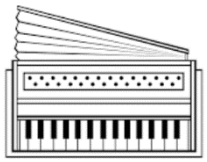
Reason: *Sound is travelling through air in this medium.*

18. Which type of pollution is shown in the image? 

a. Air	b. Water	c. Land	d. Noise

Reason: *Speaker causes noise pollution.*

19. In which of the following the vibration of instrument can be seen?

a. 	b. 	c. 	d. 
Reason: *Skin of drum can be seen while vibrating.*			
20. The sound of birds is a _____ sound.			
a. High	b. Loud	c. Pleasant	d. Unpleasant
Reason: *The sound of birds is generally considered pleasant and soothing.*			
21. Which of the following is called noise?			
a. Sound of a flute	b. Rustling of leaves	c. Pressure horn	d. Chirping birds
Reason: *A pressure horn produces sounds that are loud and typically considered noise*			
22. The astronauts use _____ for communication on Moon.			
a. Sound	b. Wireless radio system	c. Telephone	d. Mobile phone
Reason: *Astronauts use wireless radio systems for communication in space, as sound cannot travel through the vacuum of space.*			
23. Sound cannot travel through:			
a. Solid	b. Liquid	c. Gas	d. Vacuum
Reason: *Sound requires a medium (solid, liquid, or gas) to travel; it cannot propagate through a vacuum.*			
24. Sound travels in the form of:			
a. Heat	b. Waves	c. Radiations	d. Air
Reason: *Sound travels as mechanical waves.*			
25. Sound is produced by _____.			
a. Burning	b. Air	c. Soil	d. Vibrations

Reason: *Sound is created when an object vibrates, causing the surrounding air (or other medium) to move and produce waves.*