



## Grade 7 - Quarter 3\_Week 5

Name: \_\_\_\_\_ Grade & Section: \_\_\_\_\_

Teacher: \_\_\_\_\_ Score: \_\_\_\_\_

### Activity Sheet No. 4: Characteristics of Sound



#### START UP

At the end of this worksheet, the learners will be able to:

1. Explain how sound is produced.
2. Describe the characteristics of sound using the concepts of wavelength, velocity, and amplitude.
3. Identify factors that affect the pitch and loudness of the sound produced.  
Sound energy travels in the form of waves. Sound is produced through vibrations. Sound requires a medium to transmit energy.



#### CAPTURE

- A sound is a form of energy that is produced when air molecules vibrate in a particular pattern called waves. Hence, the sound is a wave.
- Vibration can be described as a back-and-forth motion of an object.
- Depending upon the vibrations, a sound is produced. Sound cannot be produced without any vibration.



When we hit the drum, membrane of drum vibrates producing sound.



When we play a guitar, the string on it makes to and fro motion and produces sound.



Sound produced by vibrating prong of tuning fork.

• Sound always requires a medium to travel from the source of its production to the receiver end. Different mediums of propagation of sound are air, liquid, and solids.

• Sound cannot travel through a vacuum as it lacks any medium of transmission.

#### How sound travels in a medium?

- Sound needs some vibration of molecules to travel.
- Solids, liquids, and gases all have molecules present in them which allow the propagation of sound.
- These molecules or particles in solids, liquids and gases are packed in varied ways.
- Solids have tightly packed particles in them and hence they allow fast propagation of sound through them as the vibrations can be carried easily from one particle to another.

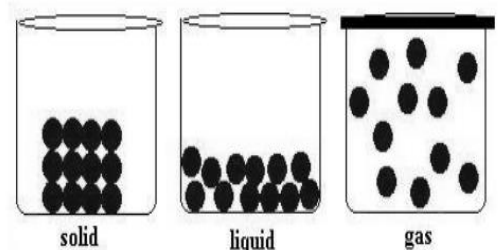
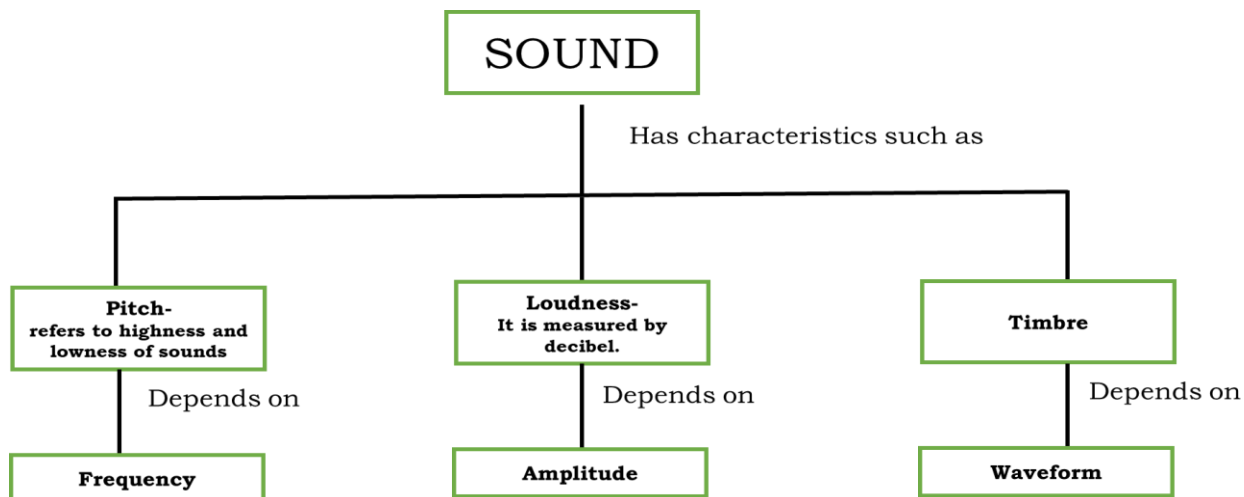


Figure 3. Molecules of Different Medium



- Liquids have slightly loosely packed particles and hence it takes a little time for sound to travel in water or through a liquid.
- Gases have completely loosely packed particles and hence sound takes the most time in travelling through the air.



## INTEGRATE

### Learning Task No. 1: My Own Sounding Box

#### Objectives:

After performing this activity, the learner should be able to construct a sounding box to:

1. Demonstrate how sound is produced.
2. Identify factors that affect the pitch and loudness of the sound produced.

#### Materials Needed:

- Shoe box
- Rubber bands of various thickness
- Extra cardboard- optional
- Pair of scissors or cutter
- Ruler

**TAKE CARE!**

Handle all sharp tools with care.

#### Procedure

1. Cut and design your shoe box as shown in Figure 2.
2. Put the rubber bands around the box. Make sure that the rubber bands are almost equally spaced and that the rubber bands are arranged according to increasing thickness from the lower end to the other end of the box.
3. Use your finger to pluck each rubber band. Listen to the sound produced.

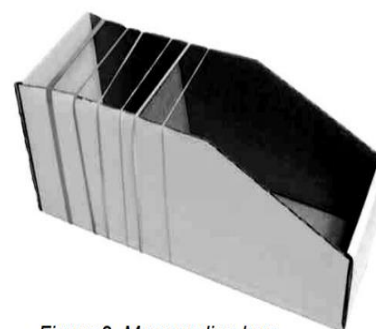


Figure 2. My sounding box



Q1. What physical signs did you observe when you plucked each band. Did you hear any sound? What produced the sound?

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Q2. How different are the sounds produced by each band with different thickness?

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4. This time use the fingers of one hand to stretch one of the elastics. Pluck the elastic with the fingers of the other hand and observe.

Q3. Are there changes in the note when you plucked the stretched band?

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5. Repeat step 4 with the other elastic bands.

Q4. Arrange the elastics in sequence from the highest note to the lowest note produced.

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## **Learning Task No. 2: Properties and Characteristics of Sound**

### **Objectives**

After performing this activity, you will use your sounding box to describe the characteristics of sound.

### **Materials Needed:**

- Sounding Box
- Wooden Rod
- Ruler

### **Procedure**

1. Label the rubber bands of your sounding box as S1, S2 and so on. Labeling should start with the thinnest rubber band.
2. Pluck each rubber band. Listen to the sounds produced.

Q1. What did you observe when you plucked each of the rubber bands and sound was produced? How then is sound produced?



\_\_\_\_\_

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\_\_\_\_\_

Q2. Is there a difference in the sound produced by each of the rubber bands? How do they differ?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Q3. Which band produced a higher sound? Which band produced a lower sound?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Q4. How can you make a softer sound? How can you make a louder sound?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Q5. What factors affect the pitch and loudness of the sound produced by the rubber bands?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. Stretch one of the rubber bands and while doing so, pluck it again.

Q6. Is there a change in the sound produced when you pluck the rubber band while stretching it? How does stretching the rubber band affect the pitch of the sound produced?

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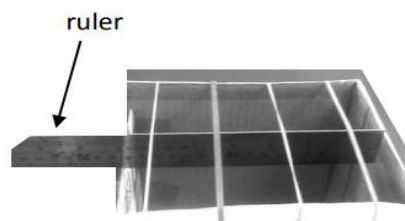
4. Place a ruler (on its edge) across the sounding box as shown in Figure 4. Pluck each rubber band and observe.

Q7. Is there a difference in the sound produced when the ruler is placed across the box?

\_\_\_\_\_

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\_\_\_\_\_



*Figure 4: With stretch rubber bands*



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5. Move the ruler off center to the left or to a diagonal position so that one side of each rubber band is shorter than the other side (Figure 5). Pluck again each rubber band on each side of the ruler and observe.



Figure 5: Diagonal stretching of the bands

- Q8. Which part of the rubber band (shorter side or longer side) provides higher pitch? Which part provides lower pitch?

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- Q9. Again, what factors affect the pitch of the sound produced by the rubber bands?

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**ENRICH**

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**Written Works No. 3**

**Directions:** Read each question carefully then choose the letter of your answer. Write your answer on the space provided before the number.

- \_\_\_\_\_ 1. Which of these pairs is **incorrectly** matched?  
A. Intensity: Amplitude  
B. Pitch: Frequency  
C. Timbre: Period  
D. Tone quality: Waveform
- \_\_\_\_\_ 2. How do sounds produce?  
A. Moving objects  
B. Vibrations  
C. Air  
D. Molecules
- \_\_\_\_\_ 3. In what medium does sound travels **FASTEST**?  
A. Gas  
B. Liquid  
C. Plasma  
D. Solid
- \_\_\_\_\_ 4. What characteristics of sound refers to highness and lowness of sound?  
A. Amplitude  
B. Frequency  
C. Pitch  
D. Timber
- \_\_\_\_\_ 5. What part of the ear receives vibrations from the eardrum?  
A. Eardrum  
B. Inner Ear  
C. Outer Ear  
D. Pinna
- \_\_\_\_\_ 6. Which of the following statement(s) is/are **TRUE**?

- |   |
|---|
| I. Sound travels faster in humid air than in dry air. |
| II. Sound travels slower in cold air than in hot air. |

- A. I  
B. II  
C. Both I and II  
D. Neither I nor II



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- \_\_\_\_\_ 7. A sound with a high frequency has a \_\_\_\_\_ pitch. A sound with a \_\_\_\_\_ frequency has a low pitch.
- A. high, low  
B. low, high  
C. medium, high  
D. high, medium
- \_\_\_\_\_ 8. What form of energy travels through air?
- A. Energy  
B. Sound  
C. Volume  
D. Wave
- \_\_\_\_\_ 9. Why does sound not travel in space?
- A. Space is too far away.  
B. There is no matter in space.  
C. Space is the final frontier.  
D. Space has planets.
- \_\_\_\_\_ 10. Why is the school library covered with carpet?
- A. So, everyone can make a lot of noise.  
B. To help absorb sounds to keep it quiet.  
C. Because it looks good  
D. To help absorb sounds so it can stay noisy.
- \_\_\_\_\_ 11. Sound travels FASTEST through which of these materials?
- A. Air  
B. Empty space  
C. Metal  
D. Water
- \_\_\_\_\_ 12. Why can a dog hear a dog whistle, but a human cannot?
- A. Dogs have bad hearing.  
B. Dogs hear at a lower frequency.  
C. Dogs bark  
D. Dogs can hear at a higher frequency.
- \_\_\_\_\_ 13. Which feature of sound is determined by amplitude?
- A. Pitch  
B. Smoothness  
C. Loudness  
D. A Wave
- \_\_\_\_\_ 14. Which feature of sound is determined by amplitude?
- A. Pitch  
B. Smoothness  
C. Loudness  
D. A Wave
- \_\_\_\_\_ 15. What will happen to the loudness of sound, as the amplitude of a sound increases?
- A. Increases  
B. Decreases  
C. does not change.  
D. cancels out.

#### References:

*Science 7. Learners' Material* pages 160-171

*Revision Notes on Sound.* askiitians.com. <https://www.askiitians.com/revision-notes/class-8-science/sound/>