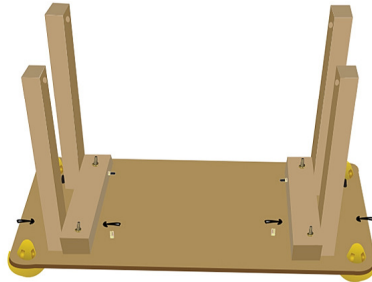
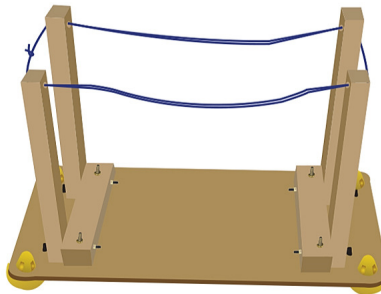


HOW TO MAKE A METALLOPHONE

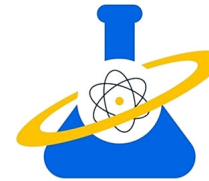
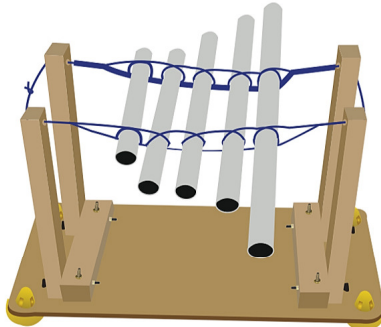
- 1 Join four wooden sticks on the wooden base using allen bolts & nuts as shown in the picture.



- 2 Pass double thread through the holes given at the top of wooden sticks and make a knot to fix it.



- 3 Make a criss cross pattern and pass metal rods through them to make a metallophone.



Future STEM Explorers

Metallophone



Learning Outcomes:

Students will be able to

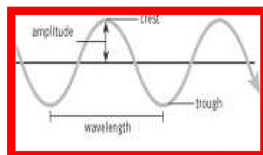
- Understand sound – its characteristics
- Know about the characteristics of sound wave
- Define metallophone
- Explain science behind working of metallophone

Introduction

Sound is a form of energy and it comes from vibrations. Vibration is to and fro motion of a particle about its mean position. These vibrations create sound waves which move through mediums such as air and water before reaching our ears. It means sound is carried in the form of waves.

Characteristics of sound wave

- **Oscillation:** One complete to and fro motion, where one full wave is constituted
- **Amplitude :** Maximum displacement of the particle from its mean position.
- **Frequency :** Number of periodic oscillations completed in one second.
- **Time period :** Time taken by the wave to complete one oscillation.



Characteristics of sound

- **Loudness** - Loudness is the way in which the human ear perceives sound wave amplitude. The larger the amplitude, the louder is the perceived sound. It mainly depends on the amplitude of sound.
- **Pitch** - Pitch is a term used to describe how high or low a note being played by a musical instrument. It depends upon frequency of sound.

Metallophone:

Metallophone is a percussion musical instrument consisting of series of hollow metallic pipes in which the sound is produced by striking the metallic pipes.

Science behind Metallophone:-

Sound is created by vibrations and can be manipulated in two ways.

- Changing the speed of vibration will affect the pitch or frequency of sound.
- Changing the amplitude will affect the loudness.

The pitch varies between each of the individual metallic pipes because of the difference in length.

The longer pipe would create slower vibration and would result in low pitch sound whereas a shorter pipe would result in fast vibrations and resulting in high pitch sound.

Hence, when hollow metallic pipes of metallophone are struck using some instrument, longer pipe will have slow vibration resulting in less number of vibrations, hence less frequency and low pitch sound will be produced and vice versa with the case of shorter pipes.

Quiz Time

1. What happens if the pipes are supported from the centre?

2. What part of a metallophone is vibrating to create music?

3. What is the relationship between pitch and frequency?

4. What would happen in case, if all pipes are of same length?