SOUND

DIFFRACTION AND REFLECTION PROJECT

Part 1: MEGAPHONES FROM HOUSEHOLD OBJECTS AND TESTING THEIR EFFICACY OF AMPLIFICATION

Megaphones are conical structures used to amplify human voice. You would have seen cheerleading megaphones in your school and sports life.

In this project, you will create megaphones from various household materials, which are hollow. mostly bottles and containers and you will test their efficacy in sound amplification. You can use your own voice for this test. In all, you will test 5 different cone configurations.

You will test the effect of cone's structure, its width area, and its length on the level of amplification. If the cone has stem or neck, you will determine its influence as well.

Your experiment needs to be videotaped and you will give a clear commentary comparing the characteristics of the unamplified sound and the amplified sound and will rank the 5 cone configurations you used for their efficacy of sound amplification. You will use the diagrams of the geometry of the cones you used to substantiate your interpretation in your commentary.

Part 2: AMPLIIFCATION OF SOUND BY REFLECTION

When you shout inside an empty vessel, it amplifies sound by the process of reflection.

In this project, you will use 5 different vessels, each with made up of different materials and/or different configurations. You can use your own voice for this test.

You will test the effect of the materials, its geometry, depth, and width as well as the geometry and dimensions of the mouth of the vessel.

Your experiment needs to be videotaped and you will give a clear commentary comparing the characteristics of the unamplified sound and the amplified sound and will rank the 5 different configurations you used for reflection of the sound based on their efficacy of sound amplification. You will use the diagrams of the geometry of the vessels you used to substantiate your interpretation in your commentary.

Part 3: AMPLIIFCATION and MODULATION OF SOUND BY AIR-WATER-CONTAINER MATERIAL COMBINATIONS

Create an unusual music instrument, from household objects, which can create a variety of harmonics-overtone expressions of different pitches.

For inspirations, watch the following videos and explore beyond:

https://www.youtube.com/watch?v=gWOeBp_ZueI

https://www.youtube.com/watch?v=XKRj-T4l-e8

https://www.youtube.com/watch?v=ezousM5zA0A

https://www.youtube.com/watch?v=eEKlRUvk9zc

https://www.youtube.com/watch?v=QdoTdG_VNV4

https://www.youtube.com/watch?v=ew-7SwLcHBg

https://www.youtube.com/watch?v=oCYHMVlQezA

https://www.youtube.com/watch?v=IvUU8joBb1Q