

Sound can travel through what??!

Jonathan Clark, Gloria Arismendy (CSIA), Nicole Clark (Hamilton)

Benchmarks:

ES-6 Describe the transmission, bending and reflection of sound.

Benchmark B: Describe that light, sound and objects move in different ways.

Objectives:

The students should be able to understand that sound is waves transmitted through matter (solid, liquids and gas). The students will also understand that some materials insulate sound (do not transmit it) and others conduct sound (amplify it or vibrate too).

Materials

Tuning forks

Classroom materials

Initial Observation/Demonstration:

The tuning fork will be struck and the students will have a chance to put it close to their ear to hear it. After this initial demonstration, the tuning fork will be struck and placed on a table, everyone will be able to hear it clearly.

Initial Observations:

The students will observe that sound travels as waves through matter. They will also hypothesize on why the tuning fork can be heard more easily when it is placed in contact with the table.

Initial Model:

Students already know that sounds travel as waves through all different kinds of matter. They will hypothesize on what kind of materials will amplify sounds and what types will insulate the sound and make it quiet.

Procedure:

This is a largely inquiry based experiment. The students will be given the freedom to choose materials around the classroom to test for sound insulation or conduction. The method of “testing” the various materials is conducted as follows:

- The tuning fork is struck on the palm of the hand to begin the vibration.
- At this point, it can only be heard by holding it close to your ear.
- Quickly after vibration starts, the fork can be placed on different surfaces (with the base down and the forks pointing up.)
- Some materials will result in an apparent amplification of the sound (ie: if the instructor hits the tuning fork and places the base on the chalkboard, the sound will become loud enough for all to hear.)
- Some materials will quickly stop the vibration by absorbing it, thus allowing for very little or no sound to be heard.

They will need to write their observations and conclusion in their science journal. The following directions will be placed on the board: “You have freedom to test many materials in this experiment. There are a few rules though. First, each group must test at least one solid, one liquid and one gas. Secondly, each group must test at least one metal item, one plastic item and one wooden item. Other than that, you have freedom to test whatever materials you want to. Make sure to describe each item in detail and how the sound is affected. You must also make a conclusion at the end of the experiment that categorizes metal, wood and plastic as conductors or insulators of sound.”

Discussion/Summary:

After 20-30 minutes or so, the groups will come back together as a class and their experimental results will be discussed. Science notebooks will be checked for good observations and details.