CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)
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Project Number
J1530

Project Title
The Densities of Liquids and the Speed of Sound through Them

Abstract

Objectives/Goals
The objective is to determine whether or not density is the sole property of a liquid that determines the speed of sound through that liquid.

Methods/Materials
Each of six liquids were measured to 100ml, weighed to find its density using the formula d=m/v and then poured into six identical 7.5 cm square plastic containers. A sound wave through air was produced by placing an empty 7.5 cm square plastic container into a cushioned plastic rectangular box between a speaker and a sound meter. A speaker was wired to a function generator and a sound meter registered back to an oscilloscope. This incoming wave was used as the control. Each liquid was then placed in the apparatus and a new wave was produced. By measuring the phase shift of each new wave against the control, a calculation was made to determine the speed of sound through each test material. These tests were performed five different times with each liquid.

Results
The liquids in order from highest to lowest density are as follows: corn syrup, glycerine, water, vegetable oil, alcohol, and kerosene. The liquids in order from fastest to slowest speed of sound are as follows: glycerine, vegetable oil, kerosene, water, corn syrup and alcohol.

Conclusions/Discussion
The results showed that density is not the sole property of a liquid that determines the speed of sound through that liquid. If it were a sole factor, there would be a linear relationship between the density and the speed of sound and this was not found in this experiment.

Summary Statement
The purpose of the project was to determine whether or not density is the sole property of a liquid that determines the speed of sound through that liquid.

Help Received
Mother helped with display board. Brother provided and operated oscilloscope and function generator at my house.