CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
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Project Number
J1819

Project Title
Good Vibrations

Abstract

Objectives/Goals
The purpose of this project was to determine whether or not the amplitude of a sound changed over distance and between different media. The hypotheses stated that the amplitude would be greater in water than in air, and that it would also be greater over distance.

Methods/Materials
A pipe apparatus was made to contain the medium (water or air) and for the sound wave to travel through. A swinger contraption was made to create the sound as it hit a metal end cap on one end of the pipe. A foam sleeve was put into the pipe to reduce reflection and resonance. A microphone waterproofed with balloon and attached to a computer was placed in the opposite end of the pipe. The computer used a program to record the sound waves the microphone picked up, and Python programming was used to then analyze, compute, and plot the data.

Results
The amplitudes in water were greater than that of those in air, as predicted by the hypothesis. The data regarding the other hypothesis proved to be less cooperative. The amplitude of the sound waves in the 6ft pipe-length for both media was bigger than that of the amplitude in the 4ft pipe-length. This could be because of some error. The rest of the data, however, proved the hypothesis to be true.

Conclusions/Discussion
In conclusion, the first hypothesis was proved, and the second one was not, although it provides a point of further study and interest. Overall, much was learned and much can still be looked into.

Summary Statement
The purpose of this project was to determine whether or not the amplitude of a sound changed over distance and between different media.

Help Received
Dad and other knowledgable mentors helped explain big science ideas; Dad taught how to use Python programming; Mom reviewed typed report; Brother hit 'record' button on computer