CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
Peter John L. Abanto

Project Number
J1301

Project Title
Which Material Can Insulate the Most Sound?

Abstract

Objectives/Goals
Objective: The experiment's purpose was to figure out what of the four materials (cotton, styrofoam, acoustic foam, and cardboard) is the best sound insulator.

Methods/Materials
Materials and Methods: The experiment contained 100 trials for each material, including the control (no material). Boxes were padded with 5cm thick of each material and a cell phone was placed inside the boxes as the sound source. The phone inside was called 100x per material and control. The amount of decibels that escaped the box were measured by a decibel reader.

Results
Results: Acoustic foam insulated the most sound with an average of 19 decibels blocked. The remaining materials, from least to greatest decibels insulated, were cardboard, cotton, and secondly styrofoam. The means of sound insulated was that cardboard insulated 13dB, cotton insulated 16dB, and styrofoam insulated 18dB from the control. The percent of decibels insulated from the control was 22% for acoustic foam, 21% for styrofoam, 18% for cotton, and 15% for cardboard.

Conclusions/Discussion
Discussion: From the experiment, acoustic foam proved to be the most effective sound insulator out of the four materials. The fact that the acoustic foam was made of foam, had a corrugated pattern, and was porous , reduced the sound waves' volume. Sound insulation is important in everyday uses, like building houses, and using it in special rooms (band, restaurant, and theatre houses).

Summary Statement
This project was conducted to see which material (styrofoam, cardboard, acoustic foam, and cotton) would be the most effective sound insulator.

Help Received
Cousins and brother helped with the reports, uncle cutting the materials, teacher let me borrow a decibel reader, brother helped in suggestions of the project