CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Joy A. Meleika

Project Number
S1814

Project Title
How Sound Waves Get Affected by SDM (Sound Dampening Material)

Abstract

Objectives/Goals
The issue of sound pollution increases due to fast (also modified) cars, MRI machines being so loud, and houses being built near freeways more. The use of incisions, creating geometrical patterns, and taking out foam, will absorb and disperse greatest amount of sound for SDM.

Methods/Materials
Materials: 2" thick dense upholstery foam, eyebrow razor, decibel reader, sound tunnel (cardstock), speaker, different hertz frequencies.
Method:
1. Design geometric shape, use eyebrow razor to cut design 1" thick. (8)
2. Use 6 different Hz sound waves
3. Place sound tunnel on speaker
4. created configuration to have an equal platform
5. test each design and write down data (repeat for each foam 7 times per Hz, use mean of data)

Results
The triangular/ pyramidal design had the best sound absorption overall. From an engineering aspect, this would not be cost- efficient for manufacturing or consumers. The counterpart, hemispherical designs, are 96% as effective and cost efficient. The beneficial counterpart creates an accessibility of SDM for any and everyone suffering from Sound Pollution.

Conclusions/Discussion
The sound dampening foam expresses easy, cost-beneficial ways to dampen sound. The experiment displayed lower frequencies, throughout each foam, due to the incisions. The geometric shapes calculated created more absorption due to its specific number of sides. This data could, one day, help a manufacturing company create outstanding Sound dampening foam.

Summary Statement
From the Engineering aspect: the geometric pyramidal design absorbed the greatest amount of sound, but its counterpart, hemispherical design (96% as effective) is better for the manufacturing and cost-effective aspect.

Help Received
Samuel Meleika (Civil Engineer)