



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.)

Zoe C. Loftus-Farren

Science Fair Use Only

S0108

Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)

Noise Pollution: Effective Sound Barrier Materials

Division

S Junior (6-8) S Senior (9-12)

Preferred Category (See page 5 for descriptions.)

1 - Applied Mechanics/ Structures & Mechanisms/ Manufacturing

Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.)

Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.

Objective: The objective of this experiment is to determine if concrete is the best material for use as a sound barrier, and if not, what is the best material for this purpose.

Materials and Methods: Seven different materials were selected to be tested for their effectiveness at both blocking and absorbing sound. The tests were done in an isolated environment within a large box. In this box, a recording device was placed at one end to provide "white noise", or static, at a constant sound level of 70dB. A digital sound level meter was placed at the other end of the box. With these two devices in place, the different materials were consecutively arranged within the box, in a manner designed to allow optimal sound blocking and absorbing capabilities.

Results: The results of this experiment showed that acoustical tile is the best sound barrier material out of the seven materials tested. The results also showed that concrete, a material very commonly used for freeway sound barriers, ranked sixth out of seven materials for this purpose.

Conclusion: This experiment demonstrated that concrete is not the best material for use as a sound barrier. In this study there were in fact several other materials that were more effective as sound barrier materials, which supported my hypothesis.

Summary Statement (In one sentence, state what your project is about.)

This project was designed to determine if concrete, a commonly used material for sound barriers, is the best material for this purpose.

Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.

Acoustical consultant, Michael Stocker, reviewed my experimental design with me; Parents helped proof read my final report.