



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Adam C. Swayze	Project Number J1522
Project Title Keep it Quiet! Which Materials Block Sound Transmission Most Effectively?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals In this project, I tested various materials including mass loaded vinyl, drywall, particle board, and egg cartons to see which materials would be most effective at blocking sound. My hypothesis was that when I had the box covered with a combination of drywall, particle board, and mass loaded vinyl, there would be the least amount of sound escaping from the box.</p> <p>Methods/Materials I built a five sided box with a 2 x 2 frame, a layer of 5/8 inch drywall, and after an air gap of three centimeters, a layer of 3/4 inch particle board. The inside of the box was lined with mass loaded vinyl, a sound resistant material. The top of the box was left open so I could place the material I wanted to test on the top of the box. As a control, I built a top for the box out of the same material from which the box was made. To generate sound, a 3162 Hz tone was set as a ring tone on a cell phone. To measure the sound escaping from the box, I used a digital decibel meter. A variety of sound insulating materials, in fact, a total of 14 different materials were tested multiple times for their ability to block sound on the open end of the box.</p> <p>Results I found that some simple materials such as a rubber floor mat can block sound more effectively than materials recommended by professionals. I even observed an egg carton was able to block a significant amount of sound.</p> <p>Conclusions/Discussion Overall, the most effective sound insulators were thick, heavy materials with double walls and an air gap between them.</p>	
Summary Statement In this project, I tested various materials including mass loaded vinyl, drywall, particle board, and egg cartons to see which materials would be most effective at blocking sound.	
Help Received I'd like to thank my father for letting me use his phone and helping me build the box.	