



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Cameron K. Stopforth	Project Number J1521
Project Title Silence Is Golden: The Soundproofing Properties of Materials	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals In this project, the goal was to find out which material would sound proof a room the most efficiently and at a reasonable cost. The prediction was that rubber matting would be the most efficient material to soundproof a room.</p> <p>Methods/Materials A box was built to simulate a room with a double drywall and wood frame like a house. The test materials were placed inside the box to insulate the "room". The sound was produced by the computer connected to the speaker inside the box. Then there was a sound meter outside the box to measure the sound that passed through the drywall. The materials that were needed to build the box are nails, drywall, and wood. The materials that were being tested inside the box were egg cartons, rubber matting, styrofoam, bubble wrap, cardboard, fabric, and foam board.</p> <p>Results The best material turned out to be 1/8th of an inch thick cardboard. Cardboard was at least 2 decibels lower than the box without anything soundproofing the box. Cardboard was also .5 decibels better than any of the other materials tested. Surprisingly cardboard was also the thinnest material. The worst material was carpet backing which was 1.3 decibels higher than the constant.</p> <p>Conclusions/Discussion The cardboard is less dense than the rubber matting, yet cardboard was cheaper and performed much better. The cardboard was effective because the sound waves are reflected into the on-coming sound waves and are distorting them to reduce sound. Further testing could be done by adding more layers of cardboard to increase the soundproofing quality.</p>	
Summary Statement This project was done to find the most cost efficient soundproofing properties of materials.	
Help Received Father helped build box; Mother helped cut paper for board	