



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

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Project Title Blocked Frequencies	
Abstract Objectives/Goals The objective of the project was to test the effectiveness of various types of earplugs using a Vernier decimeter to detect how much sound the earplugs blocked. Methods/Materials A styrofoam mannequin head was purchased and holes were drilled to represent ear canals. Holes were drilled from each ear to the center and a separate hole was drilled into the back of head and intersected the ear canal hole. Earplane, Flint, Mack's Pillow Soft, Howard Leight earplugs were tested. A computer generated gunshot was the sound used to test the earplug's effectiveness in blocking sound. The Vernier decimeter(model # 407740) was inserted into the back of the mannequins head and hooked up to a laptop computer. Using LabPro software the decimeter graphed the amount sound that passed through the earplugs. The y-axis represented the amount of decibles and the x-axis represented time. Results The experimental control (no earplugs) measured 84.03 dB. The Howard Leight Earplugs measured 73.38 dB. The Mack's Pillowsoft measured 65.32dB. The Earplane earplugs measured 75.97 dB. The Flint's earplugs measured 74.24 dB. The Mack's Pillowsoft earplugs blocked 18.71 dB more than using no earplugs; 8.06 dB more than the Howard Leight; 10.65 dB more than the Earplane; and 8.92 dB more than Flint's. Conclusions/Discussion The Mack's Pillowsoft earplugs blocked blocked 18.71 dB more than the control causing them to be the most effective form of ear protection tested.	
Summary Statement This project tested the effectiveness of different types of earplugs, utilizing Vernier technology.	
Help Received N/A	