



# CALIFORNIA STATE SCIENCE FAIR 2004 PROJECT SUMMARY

<b>Name(s)</b> <b>Daniel P. Ferons</b>	<b>Project Number</b> <b>J0209</b>
<b>Project Title</b> <b>How Loud Is Too Loud?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My experiment compares the different volumes produced by playing music on five different stereos. For my project I learned about sound and sound waves. Other topics I studied are how stereo equipment works, sound levels, and decibel levels. This information helped me solve the question: are the volume control dials of compact disk players calibrated the same?</p> <p><b>Methods/Materials</b> The materials and procedures used to test the noise produced by the stereos were: 1) Turn on the Noise Dosimeter and place microphone 2.5 centimeters away from the speaker. 2) Put Linkin Park Meteora, into the Sony compact disc player and play track eleven. 3) Turn volume up to level two and record the decibel levels. 4) Do trials three (3) times for verifying data. 5) Repeat steps three and four at the volumes of four, six, eight, and ten. 6) Repeat steps two through five with the portable Panasonic CD Player, Aiwa Digital Audio compact disc player, Psyc Sony CD player, and the Ford Car Stereo. 7) Record decibel amount, dosimeter lower limit is approximately 70 dB.</p> <p><b>Results</b> The test results showed that the volume control dials of compact disk players are not calibrated the same. The hypothesis was correct and the larger the amplifier, the more noise it can produce. The results also show that playing loud music on the stereo for extended periods of time can cause ear damage.</p> <p><b>Conclusions/Discussion</b> The volume control dials are not calibrated the same on the five stereos that were tested. Similar types of compact disc players and stereos have similar volume ranges. Both of the home stereos exceeded 120 decibels. The two personal CD players had an average decibel level of 68-99 decibels. The house stereo can be played at full volume for fifteen minutes or approximately three songs without causing ear damage. The permissible exposure for over 115 decibels is fifteen minutes. Personal CD players can be played for two to three hours at the highest setting. The permissible exposure is two hours at 100 decibels and three hours at 97 decibels.</p>	
<b>Summary Statement</b> The project determines whether the volume control dial on different audio CD players are calibrated the same and the level of sound intensity produced by each CD player.	
<b>Help Received</b> Father and Mother assisted with typing; Father's work provided the dosimeter	