



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Autri Chattopadhyay	Project Number S1102
Project Title An Analytical Study of the Effects of iPods on Hearing Loss	
Abstract Objectives/Goals IPods can produce sound levels as high as 110 to 120 decibels, the equivalent of the sound made at a Rock concert. These decibel levels can cause hearing loss after only an hour of exposure. Increased Battery Life has led to people using their iPods for long periods of time. Therefore, I believe that overexposure to iPods and listening to iPods at high volumes are factors that result in hearing loss for individuals whereas people who do not listen often or do at low volumes are not affected by this.	
Methods/Materials The Materials I used for this project are 1 Apple iPod Video fully charged, 1 Apple Style Apple headphones, and 1 Sony Stereo. The two major parts of the study were the survey and the hearing tests. I passed out a survey asking questions about how long a user listens to his/her iPod, the volumes at which they listen and if they faced any hearing discrepancies following their iPod use. I tested 4 adolescent users and 2 adult users who listened to their iPods at each of the following volumes- 40%, 50%, 60%, and 70% for a threshold shift. To do this, I found the lowest volume at which the person could hear the stereo and still make out the lyrics and at which volume the stereo was inaudible for them. Then the test subjects listened to their iPods for 1hour and 15 minutes and retook the original test to see if there was a change in audible range.	
Results 50 out of the 55 people surveyed owned iPods. 64% of the people listened at volume of 50% or less but the remaining 36% listened at 60% volume or higher. 21 of the 50 people or 42% listen to their iPods for longer than 5 hours a week. Only 11 of them reported any hearing discrepancies. Subjects A and B listened at 40% and 50% volumes and only had a change of .25 volume in their audible ranges. Subjects C and D listened at 60% and 70% volume and had a change of .5 to .75 volumes in their audible ranges. They also faced slight tinnitus.	
Conclusions/Discussion iPod volumes have a direct correlation with hearing loss as threshold shift was greater in people that listened to their iPods at high volumes. Time did not have a direct effect on the subjects hearing. Based on this study, it can be concluded that listening to your iPod at high volumes can directly result in hearing loss, but someone can listen to their iPods for extended periods of time as long as they do not listen at high volumes.	
Summary Statement This study was conducted to see if overexposure to iPods and listening to iPods at high volumes are factors that can directly lead to noise induced hearing loss.	
Help Received	