



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Paul M. Cooper	Project Number S1004
Project Title Do You Hear What I Hear?	
Abstract Objectives/Goals My project was to determine how accurately a test subject can determine the direction of sound. I believe that sound sources placed to the sides of the subject will be determined more accurately than those placed directly in front or behind the subject. The slight time differences of the sounds reaching the ear depending on where the source of the sound is located can make the determination of the location of the sound more difficult. Methods/Materials Informed consent was obtained from 32 randomly selected people. I recorded a tone from my keyboard on a cassette tape with a tape recorder. I blindfolded each test subject, then stood a distance of 10 feet from the subject. I played the tone while standing directly in front, behind, to the left, to the right, and at the midpoints between all these extremes and instructed the subject to point in the direction he thinks the source of the sound is. The distance between where the subject pointed and the actual sound source location was measured and recorded for each location. The accuracy of each individual's binaural hearing was determined and analyzed. Results The overall accuracy of binural hearing (average) is 84%. The accuracy in locating the sound sources in each location are as follows: Directly in front -94%; Directly behind - 91%; Directly to the left - 89%; Directly to the right - 85%; Midpoint between front and right - 80%; Midpoint between front and left - 76%; Midpoint between behind and right - 75%; Midpoint between behind and left - 79%. Conclusions/Discussion The data collected disproved my hypothesis that sound sources placed directly to the sides would be more accurately located than those directly in front or behind. The sound sources placed directly in front or behind the subject were more accurately located. All subjects had moderate difficulty locating the sources placed at the midpoints.	
Summary Statement Determining the accuracy of binaural hearing.	
Help Received Teacher loaned books on sound and sound experiments.	