



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Jack McSweeney; Gemma Ypparila	Project Number S0713
Project Title Transmission of Sound Waves through Fiber Optics and Red Light	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals We wanted to find out if we could build a fiber optic system which was capable of transmitting a signal from both an iPod and signal generator to a set of speakers. We also wanted to find what range of frequency the system could effectively transmit without significant loss.</p> <p>Methods/Materials Our hypothesis was that if the fiber optic link was useful then it would transmit a range of frequency between 50 Hz and 15,000 Hz without losing more than 30% of the original signal. With the help of mentor, we drew up schematics for the transmitter and receiver circuit boards. Using these as a guide, we built the circuit boards, soldering the parts together and altering them as needed. Then, we tested to see if the board was wired correctly by plugging the iPod into the input and connecting the output to a set of speakers to see if the music was audible. We hooked the signal generator to the input and compared the original signal to the output, testing different frequencies in order to find the minimum and maximum values before the signal was significantly distorted.</p> <p>Results By testing a large range of frequencies, we discovered that between 40 and 15,000 Hz we could effectively transmit the signal so that less than 30% of the original signal was lost. We also found that all frequencies between 130 and 5,000 Hz produced zero signal loss, and therefore were most efficient.</p> <p>Conclusions/Discussion In conclusion, our hypothesis was correct in the essence that we were able to successfully build our own fiber optic system and we were able to find the exact frequencies that the system could effectively transmit. If we could extend our project we would use a longer fiber optic cable and test what effect a longer cable would have on the range of the frequency transmitted.</p>	
Summary Statement Our project is about whether or not we could build our own fiber optic system and how efficient the system would be in transmitting red light.	
Help Received Father served as the mentor and helped with schematics	