



**CALIFORNIA STATE SCIENCE FAIR  
2010 PROJECT SUMMARY**

<b>Name(s)</b> <b>Henry W. Treadway</b>	<b>Project Number</b> <b>S0326</b>
<b>Project Title</b> <b>Missing the Pitch? A Study of Age and a Person's Ability to Hear Higher Sound Frequencies</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective was to find out whether, as people age, their ability to hear high frequencies decreases or increases.</p> <p><b>Methods/Materials</b> After having each participant sign an informed consent form, I tested 76 people with a frequency generator. I played a frequency for the subject and then increased the frequency by 1000 Hz. until he or she was unable to hear the sound. Then I lowered the frequency in 1000 Hz. increments to the next highest level that the subject could hear. I then increased the frequency by 100 Hz. increments until the subject could not hear the sound. The subjects were of varied ages and genders. The materials included a frequency generator, a wire, a speaker, and informed consent forms.</p> <p><b>Results</b> As the age of my subjects increased, with a few exceptions, the frequency the subjects were able to hear decreased in value. I found that women, generally, can hear higher frequencies than men of the same age. I also found that the between the 5-10 age group and the 11-20 age group, the percentage drop was 40.42 percent, an extremely large drop.</p> <p><b>Conclusions/Discussion</b> As people age, their ability to hear high frequencies decreases as a result of the cochlea's (a part of the ear that receives a vibration after the ear drum or tympanic membrane is vibrated) hair cells decreasing in number because of sound waves traveling into the ear. This makes the results seem to be plausible because a younger person, ideally, would be exposed to a smaller amount of sound than an older person would have over their respective lifetimes. However, this may not always be the case, since, for example one person may listen to more music or other "loud sounds" than another. Thus, the results would not be perfect. A larger sampling than what I got would be needed for a more conclusive finding.</p>	
<b>Summary Statement</b> My project is to find a relationship between a person's age and his or her ability to hear high frequencies.	
<b>Help Received</b> My father helped me attach the wire to the frequency generator, My teacher loaned me a frequency generator	