



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Seungjoon Lee	Project Number J0623
Project Title The Distinguishable Tone "A"	
Objectives/Goals To determine whether the 3rd octave of tone 'A' (3.52kHz) is the most distinguishable sound to humans.	
Abstract	
Methods/Materials 1. Downloaded for selected 4 sounds to an MP3 player. 2. Produced the 7 tones using the "Note Worthy Composer" computer program on a laptop. 3. Recruited 53 volunteer students without bias. 4. Divided the 53 volunteers into 2 groups of 31 students and 22 students. 5. Instructed the students to raise their hands if they heard the tone within the sound. 6. Presented each of the individual 7 tones, simultaneously with each of the 4 sounds. 7. Played the instrumental classical music recorded with each of the 7 different tones for the subjects for a specified amount of time. 8. Gathered data based on individual responses. 9. Repeated steps 7 and 8 for each of the other 3 sounds. 10. Tallied the results. 11. Used the data to determine which tone is most distinguishable to the human ear.	
Results Presented with "Classical music," the 3rd octave of tone 'A' (3.52 kHz) was the most detected. (43 students out of 53) Presented with "Sound of falling rain," the 3rd octave of tone 'A' (3.52 kHz) was the most detected. (38 students out of 53) Presented with "Speech," the 3rd octave of tone 'A' (3.52 kHz) was the most detected. (45 students out of 53) Presented with "Christian rock," the 3rd octave of tone 'A' (3.52 kHz) was the most detected. (22 students out of 31)	
Conclusions/Discussion Humans can hear the 3rd octave of tone 'A' over almost any other sound. As my research indicated the frequency of tone 'A' is nearly the same as the natural frequency of the human ear. The 3rd octave of tone 'A' and the natural frequency of the human ear combine to make resonance thus emphasizing the 3rd octave of tone 'A' for the human ear.	
Summary Statement Through the experiments, I evaluated that the 3rd octave of tone 'A' (3.52 kHz) is the most distinguishable sound to humans.	
Help Received 53 students have helped me with my experiments and Mr. Akin provided the classroom to accomplish the experiments successfully.	