



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Claire V. Appelmans	Project Number J1102
Project Title Musical Mutts	
Abstract Objectives/Goals My dog howls when I play viola. The objective is to find out what part of the harmonic series my dog howls to. The harmonic series is made up of two parts which are called overtones and fundamental. My null hypothesis is that my dog will respond to the overtones, fundamental, and the whole note (control) I play for her equally. My alternate hypothesis is that my dog will respond to these treatments differently. Methods/Materials Using a randomized complete blocks design, I presented three treatments in six double-blind Trials. The three treatments were a control (whole note), overtones, and fundamental. To create these treatments I used the software Sound Forge which filtered out parts of the harmonic series. To collect data I videotaped my dog's response to each treatment. Watching the video recording, I counted the seconds my dog howled. Results My dog responded to the treatments differently. She responded more to the control, which was both the fundamental note along with overtones on the viola, and the overtones, than to just the fundamental. Conclusions/Discussion My dog responds to the overtones more than the fundamental. She always responded to the recorded viola (control), overtones, but not the fundamental. Her response to the live viola was always greater than the recorded music. This could be caused by the fact that my microphone only picks up frequencies from 20-20,000 Hz and my dog can hear up to 44,000 Hz. Further study is being done with other dogs to see if they respond in the same way my dog did to the control, overtones and fundamental.	
Summary Statement Why does my dog howl when I play certain songs on my viola?	
Help Received My piano teacher introduced me to the idea of overtones. A friend who is a musical technician from Humboldt State University told me about the software Sound Forge. My father helped me come up with ideas for controlling variables, he motivated me, and he was present at Trials.	