



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Marcelle N. Phene	Project Number J1532
Project Title Good Vibrations	
Abstract Objectives/Goals My goal in doing this project was to study how the length of a resonator affects the amplitude of sound that a vibraphone bar gives off. Methods/Materials A decibel meter was used to measure the amount of resonance an A4 bar of a *Musser vibraphone gives off with the resonators A ³ -A ⁵ underneath it. Room temperature was measured and recorded throughout this experiment to quantify any possible air temperature changes. On any vibraphone, each resonator is aligned with its tuned bar. Thus, the experiment began with the A ⁴ resonator underneath the A ⁴ bar. A hard plastic mallet, wrapped in yarn was used to strike the bar; the mallet was mounted to a stand throughout the experiment to provide exact replication of force and angle to each strike. The resonators were rotated so a different resonator was underneath the A ⁴ bar for each #treatment# of the experiment. Then the striking of the bars was repeated three times each. *Brand names are used for the sole purpose of identification and are not meant as endorsements by the author. Results The length of the resonators did affect how much of the sound was amplified; with the correct resonator the sound was amplified the most. Conclusions/Discussion The length of the resonator does affect how much of the bar#s sound it amplifies. The resonators need to be the length that matches the tuning of the bar it is underneath. Concert halls, for example, have to be specifically tuned so that they do not have higher resonance frequencies for one certain pitch. If this were to happen then when that pitch is played it will be over emphasized. This applies to my experiment because if the resonators were all the same length then they might have a higher resonance frequency to one pitch and when someone strikes that bar it will be over emphasized.	
Summary Statement My project is about how much resonance is occurring with different length resonators under vibraphone bars.	
Help Received Used vibraphone from Alta Sierra Band; Percussion Instructor helped move resonators & supervise during experiment.	