



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

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Project Title Power of Sound	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Our goals in this project are firstly, to find the relationship between the resonant frequency of a wire compared to it's length and diameter; and secondly, to make a reasonable hypothesis, based on our finding and other research, of how we think the Tacoma Narrows bridge collapsed.</p> <p>Methods/Materials We used the following items in our project: 6 steel wires of .025" in diameter, 4 steel wires of .05" in diameter, a block of wood, a 16" speaker, tone generator, glue, and an amplifier. This is the method we used: Glue the block of wood to the inside of the speaker. Cut the .025" wires so that there is 1 12", 1 11", 1 10", 1 9", 1 8" and 1 7". Cut the .05" wire so that there is 1 12", 1 11", 1 10" and 1 9". Insert the wires 1/2" into the wood. Attach the tone generator and the amplifier to the speaker. Turn on the tone generator and the amplifier and use the dial on the tone generator to experiment with the resonant frequencies.</p> <p>Results We expected a correlation between wire length, diameter, and resonant frequency. We graphed the results with wire length on the X axis and resonant frequency on the Y axis for both sizes of wire (.025" and .05"). We found that as the length of the music wire increased, the resonant frequency (Hz) decreased. We also found that one .025" wire that was 12" long had a lower resonant frequency than one .05" wire that was also 12" long.</p> <p>Conclusions/Discussion Our results achieved our goal in identifying the factors that affect the resonant frequency of different sized objects. After doing this project we are now able to better understand how the Tacoma Narrows bridge fell down and further improved our knowledge of the physics of mass in motion.</p>	
Summary Statement Our project is about the factors affecting the resonant frequencies of different sized music wires.	
Help Received Dad gave us good books from the library; Dad gave us a tone generator, speaker and amplifier; Mom helped us get organized.	