



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Natalya D. Rodriguez	Project Number S1617
Project Title The Effect of Playing Different Notes on the Duration of the Sympathetic Vibrations of a C2 String of a Piano	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment was to learn how playing C,E, and B notes affects the duration of the sympathetic vibrations on the C2 string of a piano.</p> <p>Methods/Materials Materials: Baby grand piano, stop watch, writing utensil, composition notebook Method: - The C2 key was pressed down slowly and gently until the damper was raised. The key was held down until after the stopwatch was stopped. - #3, 2, 1, go!# was counted down. On #Go!#, a loud, short note was played on the C3 key. - The timer was started by the assistant on #Go!# - The sympathetic vibrations on the C2 string were listened for. As soon as they were inaudible, #Stop!# was said, and the stopwatch was stopped by the assistant. - The time was recorded in a composition notebook. - The previous steps were repeated until 10 times were recorded for C3. - The previous steps were repeated playing the other test notes (C4, C5, C6, E2, E3, E4, E5, E6, B2, B3, B4, B5) instead of C3. Each note was tested 10 times.</p> <p>Results Overall, the C notes produced sympathetic vibrations on the C2 string with an average duration of 19.05 seconds. The E notes produced sympathetic vibrations lasting 19.15 seconds on average, and the B notes produced sympathetic vibrations with an average duration of 14.45 seconds.</p> <p>Conclusions/Discussion Notes that share more resonant frequencies with a resonant body (i.e., the C2 string) tend to produce longer lasting sympathetic vibrations than those that have fewer harmonics in common.</p>	
Summary Statement This project explores the connection between the number of resonant frequencies two resonant bodies share and the duration of sympathetic vibrations produced on those bodies.	
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