



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Ryan J. Vig</b>	<b>Project Number</b> <b>J0223</b>
<b>Project Title</b> <b>What Material Makes a More Resonant Acoustic Instrument Soundboard?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective is to determine what materials make a more resonant acoustic soundboard for a musical instrument. <b>Methods/Materials</b> A test stringed instrument was built with the ability to interchange different soundboard samples to be tested. Eight different materials were mounted on wooden hoop frames, including thick birch plywood, thin birch plywood, galvanized steel, acrylic plastic, tempered masonite, illustration board, rawhide, and untempered masonite. A microphone was mounted to the test instrument to capture the sound. An automatic strumming device was used to strum the strings. A computer was used to record and measure the sound for analysis. <b>Results</b> The tested materials produced an initial sound volume in a range of 13 to 48 decibels. The sustained volume at 2 seconds was between 1 to 9 decibels. Thin birch plywood produced the highest initial and sustained volume. <b>Conclusions/Discussion</b> My conclusion was that my hypothesis was correct and that the thin birch plywood outperformed the other materials in both initial and sustained volume, thereby producing a more resonant sound overall.	
<b>Summary Statement</b> My project demonstrates and compares the ability of different materials to produce and amplify sound vibrations in an acoustical stringed instrument.	
<b>Help Received</b> My father gave me advice on my design and construction of the test instrument. He also supervised my use of the power tools I needed to build it. My mother helped me with some of the typing and editing.	