



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Camille L. Miller	Project Number J1618
Project Title The Soundpost: Why Is It Called "The Soul of the Violin"?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals To determine how the placement of the soundpost affects the violin's sound.</p> <p>Methods/Materials The A-string on the violin was tuned to 440Hz. Then, the sound wave produced from the standard soundpost position was recorded as a baseline for comparison. All the other tests were documented by their relative location to the bridge and the right f-hole. Next, the soundpost was moved to each desired position using the soundpost setter, the soundpost retriever, and a stainless steel metric ruler. After each move of the soundpost, the sound wave was recorded using a computer running an audio spectrum analysis program. Lastly, all the sound waves were compared and linked to the human perception of the sound heard.</p> <p>Results When moving the soundpost as a mirror image to the other side of the bridge, a brighter sound occurred. This result was much different from my hypothesis of the human ear hearing no change in sound. Moving the soundpost towards the right f-hole resulted in a brighter tone, when I originally thought the sound would be edgy. Lastly, when the soundpost was moved towards the left, a banjo-like sound occurred, when I hypothesized the sound would be gentle and soft.</p> <p>Conclusions/Discussion My tests concluded with results that somewhat differed from my hypothesis, but didn't contradict the general idea of sound change due to soundpost movement. I thought that when moving the soundpost as a mirror image to the bridge, the human ear would hear no change in sound, because the distance from the bridge would stay the same. In fact, a slight difference in sound occurred, because the f-hole is not perfectly vertical, creating a different relative distance to the soundpost. I also assumed that when moving the soundpost to the right, the sound would be more edgy and harsh, but actually, the sound stayed somewhat standard with many overtones on the A-string, because the upper strings were intensified. Lastly, I thought that when the soundpost was moved to the left, the sound would be gentle and soft, but instead, a banjo-like sound resulted. I think this was because the base bar and the soundpost were too close together creating an imbalanced vibration. In conclusion, by adjusting the soundpost in these two directions, each violin's tone quality can be fine-tuned to create it's best sound. Now we understand why the soundpost earns its title as "The Soul of the Violin".</p>	
Summary Statement This project shows the correlation between the soundpost location and the quality of the violin sound produced.	
Help Received Dad helped stabilize board (wooden piece taped to back of board); Dr. Kuchera-Morin and Mr. Bell from UCSB helped analyze spectrum analysis graphs; Linda West moved soundpost to different locations (Note: only a professional could do this delicate job because years of training are needed.)	