



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Josephine A. Tsai	Project Number J1819
Project Title How Does Bow Tension Affect the Sound Produced by a Violin?	
Abstract Objectives/Goals The objective of the experiment was to examine how violin bow tension affects the loudness of the sound on a violin. It is expected that higher hair tension on a bow will produce louder sounds. This is because higher tension creates more friction with the string, causing the string to vibrate more and thus produce a louder sound. Methods/Materials A full-size violin and bow were used in the experiment. Three bow hair tensions (measured as the distance between bow hair and the stick at 0.5, 1, and 1.5 cm) were tested on each of the four strings. For each tension, ten notes were played and the average sound (in decibels) of the ten notes was obtained. The loudness of the sounds was measured by a Digital Sound Level Recorder. Results The notes played by the bow with the highest hair tension produced the loudest sound while the notes played with the lowest hair tension produced the quietest sound. The same relationship exists for all four strings. Conclusions/Discussion The experiment confirms the hypothesis that higher bow hair tension increases the loudness of sounds.	
Summary Statement My project is about measuring the affect that bow tension has on the loudness of the sound produced by a violin.	
Help Received I designed and carried out the experiment by myself.	