



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Ricardo C. Robledo</b>	<b>Project Number</b> <b>J1534</b>
<b>Project Title</b> <b>The Loudness of Different Sized Stringed Instruments</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective for this project was to figure out which stringed instrument had the greater loudness. Then the problem established was, "What is the effect of different sized stringed instruments on loudness?" The hypothesis that was thought was, "If the size of the stringed instrument (a violin, viola, cello, and double bass) is bigger, then the instrument will be louder."</p> <p><b>Methods/Materials</b> In the experiment, the independent variables were the different instruments played. The controlled variables were the sound meter, distance between both items, same note ("A"), the same person playing, same room being played in, same tempo, and the same pressure applied to the instruments. The size of the instruments are in order from smallest to largest; violin, viola, cello, string bass. The way the results were gotten, were by playing an "A" note on the second string on every instrument. For the violin, a fourth finger: for the viola and cello, first finger: and for the string bass, an open string. The sound meter was put 30cm away from the instrument. The sound meter was at the level 70 to 90 db. The instruments were played for 4 counts at 80 beats per minute. This step was done 40 times on each instrument. That would mean that each time counted as a trial, therefore making forty trials for each instrument, or 160 trials all together.</p> <p><b>Results</b> The results came out to oppose the hypothesis. Results, at the average note, were as follows: violin, 85.9 db: viola, 79.5 db: cello, 76.52 db: double bass, 75.97 db.</p> <p><b>Conclusions/Discussion</b> As a conclusion, it is not the biggest instrument having the greater loudness. The smallest, the violin, has the greatest loudness, and the string bass, the biggest, has the smallest loudness.</p>	
<b>Summary Statement</b> Loudness was measured in decibels by playing different sized stringed instruments.	
<b>Help Received</b> SB Music teacher Mike Pretzer provided Viola & Double Bass. Dad helped Gluing & Pictures. Mom helped type report & record results.	