



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

<b>Name(s)</b> Shane C. McDonough	<b>Project Number</b> <b>S0220</b>
<b>Project Title</b> <b>The Intonation of Natural and Synthetic Clarinet Reeds</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My project's objective was to compare and test natural cane and synthetic plastic clarinet reeds in order to determine which material can produce better intonation over a greater range of registers.</p> <p><b>Methods/Materials</b> My materials included an electric tuner, two brands of medium strength natural cane clarinet reeds, and two brands of medium strength synthetic plastic clarinet reeds. My project involved four volunteer clarinetists as well. I had each volunteer play the concert B flat tuning note in all three octaves and used the tuner to see whether the note was flat, sharp, or in tune. Each volunteer tested all four brands of reed (I used one volunteer per trial). The level of intonation produced by each reed was recorded and converted from qualitative data to quantitative data using a scale that I created. The numbers produced by this scale were then turned into averages that indicated which reed produced the greatest range of in tune pitches.</p> <p><b>Results</b> Overall, the natural cane reeds were generally more in tune than the synthetic plastic reeds. The cane reeds were more in tune in the lower and middle octaves, while the plastic reeds were slightly more in tune in the high octave. The overall averages indicated that the cane reeds produced better intonation levels over a larger range of notes.</p> <p><b>Conclusions/Discussion</b> I predicted that the natural cane reeds would produce better intonation over a broader spectrum of octaves than the synthetic plastic reeds because cane is a naturally flexible (flexibility is an essential trait required for a material to carry vibrations) and has been used and perfected as reed material for a longer amount of time than plastic. This hypothesis was correct according to the overall average level of intonation. However, although the natural cane reeds had more in tune averages in both the low and middle octaves, in the high octave the synthetic plastic reeds averaged slightly more in tune. This suggests that the high octave requires less reed flexibility and shorter vibrations than the low and middle registers meaning that synthetic plastic clarinet reeds could perform as well or better than natural cane reeds in musical pieces that involve many notes in the high octave. In conclusion, the natural cane reeds had a greater range of intonation than the synthetic plastic reeds.</p>	
<b>Summary Statement</b> My project examines the effects of synthetic and natural clarinet reeds on a clarinet's range of intonation.	
<b>Help Received</b> My clarinet ensemble director helped me in forming a hypothesis and gathering background information. My Band Director provided the facilities and the tuning equipment for my experiment. My parents helped me to pay for the clarinet reeds used in my experiment.	