



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> <b>Maddie Schwarz</b>	<b>Project Number</b> <b>J0233</b>
<b>Project Title</b> <b>A Tap Dancing Machine for the Hearing Impaired</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> I set out to invent a device that enables the hearing impaired and the deaf to appreciate the rhythm of a tap dance, while maintaining a great performance quality for the hearing. I predict that my invention will be successful and that it will be an effective performance tool for both the hearing and hearing impaired.</p> <p><b>Methods/Materials</b> My invention is comprised of a portion for the hearing and a portion for the hearing impaired. The former is made of four plywood boards with drum triggers (a type of vibration sensor) underneath them, which makes a sound on a drum module. The portion for the hearing impaired uses a sensor called the "Light Dancer Interface" and a fluorescent blue lamp that flashes each time a tap is made. To test my invention, I performed on my invention for ten subjects who were unable to hear. I administered two tests: a test of correctly repeated rhythms and a written survey.</p> <p><b>Results</b> I successfully created my "tap dancing machine" with little difficulties, excluding a change in my original diagram. 90% of my subjects were able to correctly repeat the rhythms I tapped on my invention after no more than three tries, so I can conclude that the deaf and hearing impaired could appreciate the rhythm of my tapping after a short period of time. All of my subjects enjoyed the performance, and 80% said they would enjoy my invention in a performance, so overall, my results were positive and were what I hoped for.</p> <p><b>Conclusions/Discussion</b> The results of my invention were positive, overall, and I believe my hypothesis to be correct. I successfully built my invention with hardly any difficulties, and obtained truthful results from my survey. The people who took my survey enjoyed watching the invention in action, and on their surveys, gave me support and suggestions for the invention. I can conclude that this invention is definitely impressive and entertaining for the hearing, and is most likely a great tool for the hearing-impaired and deaf. Future experimentations could include adding separate lights for each board, possibly in different colors, separating the boards so that a different dancer could be on each board, and performing with my invention for a deaf audience.</p>	
<b>Summary Statement</b> I created an invention that allows both the hearing and hearing impaired to appreciate tap dancing to its full value, by providing an electronic drum sound and a flashing light for each tap.	
<b>Help Received</b> Tap teacher helped with wiring and preliminary invention; electrician helped create diagram and find parts for invention.	