



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> Samuel H. In	<b>Project Number</b> <b>J0315</b>
<b>Project Title</b> <b>The Sweetest Bat: How Does Sound Amplitude Affect the Sweet Zone of a Bat?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this experiment was to see whether or not the difference in sound amplitude between the sweet spot and the sweet zone affected the difference in ball exit speed off of the sweet zone. The experimenter hypothesized that 80% of the bats with the least difference in sound amplitude would have a difference in ball exit speed that would also be smaller.</p> <p><b>Methods/Materials</b> A bat swinging machine first had to be made by stabilizing a pole to a wooden base, and then attaching a garage door spring to the pole using U-bolts. Then, the spring was also connected to the wood base, by attaching another block of wood to the base and then connecting the wood to the spring with zipties. Bats were then attached with Velcro straps and ball exit speed and sound amplitude was measured from 5 ft. away. Each bat took three measurements of exit speed and amplitude for every 2 in. from the handle of the bat.</p> <p><b>Results</b> The results showed that the difference in sound amplitude correlates with the difference in ball exit speed, meaning an effect on the size of the sweet zone. For the most part (about 76%), bats with a small difference in sound amplitude also had a small difference in ball exit speed. In order to further prove and support the hypothesis, more trials and more bats would be necessary.</p> <p><b>Conclusions/Discussion</b> The results proved the experimenter's hypothesis wrong, due to the fact that not enough bats with a small difference in sound amplitude also produced a small difference in ball exit speed. However, enough bats, especially of the alloy material (7 out of 7), had positive results to prove the theory right that sound can affect the size of the sweet zone. Also, based on the data, the optimum choice for a bat would be a big barrel bat of the Demarini or Combat brand. In order to save money, get a bat with these characteristics. But, considering that not many patterns appeared, the swing itself is much more important than the actual bat.</p>	
<b>Summary Statement</b> Sound amplitude does impact the sweet zone of a bat; meaning a small difference in sound amplitude leads to a small difference in ball exit speed.	
<b>Help Received</b> Dad helped conduct experiment; Michael Smart and the Scripps Ranch Renegades provided bats; Darren Critchlow mentored and guided me; Mrs. Elaine Gillum helped edit and revise my papers.	