



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Erik J. Aidukas	Project Number J0201
Project Title Does Drumstick Material Affect the Rebound of Drumsticks on the Snare Drum?	
Objectives/Goals The purpose of this experiment was to see if there was a measurable difference between the rebound heights of drumsticks on a snare drum according to what material the drumstick was made of. The hypothesis was if man-made materials, such as fiberglass, had more consistent properties (such as optimal balance point and consistent density) than organic materials, such as wood, then the man-made materials would have consistently greater rebound. The independent variable, or cause, was the different types of materials out of which the drumsticks were made. The dependent variable, or the effect, was the height of the rebound off the head of the snare drum.	
Abstract Methods/Materials A catapult-type apparatus that mimicked the way a drummer holds the stick and hits the drum was designed and built. The torque was kept at a constant Newton # meter, which was 0.67 N-m for trials 1-5 and 11-15 and 1.00 N-m for trials 6-10, measured at the release point. A digital camcorder was used to record the rebound height against a backdrop of graph paper with a grid size of 2 mm per side of each square.	
Results The material type that produced the highest rebound at 0.67 N-m torque was the Titanium Alloy Fiberglass nylon tip sticks. The Hickory wood tip drumsticks had the highest rebound at 1.00 N-m and they also tied with the Oak nylon tip sticks in the experiment trials that had the collision point offset from the edge of the drum. It was demonstrated mathematically that the effects of gravity were not significant enough to change the conclusions.	
Conclusions/Discussion The varying of the results of the experiments demonstrates there isn't a clear connecting relationship between material type and the rebound of the drumsticks, despite what various manufacturers state. There were two opportunities for human error in the experimental design, the point of release and the observed high point of the rebound. Removing these problems would remove the high and low extremes, making the data averages more consistent. However, it still may be that there is no constant correlation between drumstick material type and the height of its rebound off the snare drum.	
Summary Statement The purpose of this project was to see if there was a measurable difference between the rebound heights, which contributes to the speed of play, of drumsticks on a snare drum according to what material the drumstick is made of.	
Help Received My teacher supplied lab equipment. My neighbor used his drill press to make the hole in which the drumstick was held. My dad released the drumsticks at the angle I measured. My mom helped glue the elements on the display board.	