



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Christopher M. Williams	Project Number J1139
Project Title Which Battery Brand Best Meets the Accuracy Challenge?	
Abstract Objectives/Goals My robotic team discovered that the accuracy of the robot's performance decreased as it repeated its task on the challenge course. My objective was to determine if one particular brand of battery would assist the robot in performing at a consistent rate. Methods/Materials I built one Lego robot and programmed it to complete a test run that consisted of moving up a straight course with a 10 degree slope making three stops occurring at .5, .6, and 3.4 second intervals. I marked and measured the distance at Stop 1, Stop 2, and Stop 3 on a sheet of paper that ran along side the course. Testing three brands of batteries, I used each brand in the robot for a total of 30 runs. At Stop 1 of the first battery brand, I found the difference in distance between each of the 30 runs and calculated an average. I did this for Stop 2 and Stop 3. After totaling those averages per battery brand, I compared all three battery brands to each other. This allowed me to find the brand that varied the least and would be the most effective battery to use. Results The most consistent brand of battery was Kirkland with an average variance of 3.653". Duracell followed at 3.937" and then Energizer at 4.308". Conclusions/Discussion Batteries do not all provide power at a consistent rate. This variance creates a problem when the robot must be accurate in stopping at a precise point on its robotic course. The results of this experiment suggest that I should use Kirkland batteries in my future robotic challenges.	
Summary Statement During a robotic challenge, the brand of battery being used might affect the accuracy of the stops the robot makes on its course.	
Help Received My mother typed part of the project, recorded data as I measured, and assisted in board layout. Mr. Hodges and Mrs. Nelson, science teachers at the intermediate and high schools, critiqued my project before this competition.	