



**CALIFORNIA STATE SCIENCE FAIR  
2012 PROJECT SUMMARY**

<b>Name(s)</b> <b>Samuel P. Ferguson</b>	<b>Project Number</b> <b>J0307</b>
<b>Project Title</b> <b>Lessons in Speed Learned in My Soap Box Derby Car</b>	
<b>Abstract</b> <b>Objectives/Goals</b> This experiment was conducted to test the effect that weight distribution and driver height have on the speed of a Super Stock soap box derby car. The hypotheses being tested is that the car will go the fastest when ballast weight is placed in the rear of the car and the driver position is low in the car when driving. The experiment will prove or disprove the two common practices of front placed weights and elevated driver position and the idea that these will slow the car, not speed it up. Competitive soap box derby races are often won or lost by as little as .001 seconds in time differentials when drivers cross a finish line so understanding the impact of these two variables are critical to a successful racing strategy. <b>Methods/Materials</b> The experiment used a Super Stock, All American Soap Box Derby (AASBD) car. The car was built using a standardized kit and plan, for a regulation Super Stock soap box derby car and these were procured through the AASBD. The variables tested were done by using an accelerometer and GPS app in an ipad 2, to track the speed and velocity achieved in the car on a track that was 500 feet in length. The car was weighted to 240 pounds, driver and car total, per AASBD rules. <b>Results</b> The results of the experiment proved that rear ballast weight and low driver position gave the fastest speed down the track. Common practices that racers engage in, which are: placing weight in the front of the car and not sitting low enough in the car, were proven to have a negative impact on speed and distance traveled when crossing the finish line <b>Conclusions/Discussion</b> To conclude it is clear that sitting as low as possible and placing as much of the ballast weight in the rear, will give a driver the best chance at crossing the finish line of a race quicker than a racer who is sitting higher in their car or who has placed their ballast weight in the front of the car.	
<b>Summary Statement</b> Winning a soap box derby race requires a solid strategy and superior skill and to help my soap box derby team at Literacy First Charter I need to understand the impact that driver position and weight placement have on the speed of our cars.	
<b>Help Received</b> My mentor for derby racing was consulted during the building of the car, Paul Gale	