



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

<b>Name(s)</b> Alex R. Bennett	<b>Project Number</b> <b>J0204</b>
<b>Project Title</b> <b>Need for Speed: Optimization of a 1:18 Scale Radio Controlled Car for Speed</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of this project was to determine the effect motor design, gearing, tire design and car weight on maximum speed achieved with 1 1:18th scale model car. <b>Methods/Materials</b> A standard electric motor containing brushes was compared to a brushless electric motor in a Team Losi Mini T Pro- 1:18th scale electric car. Weights were attached to the car body using velcro strips. Different size pinon gears and tire designs were also tested. Maximum speed of the car with the different variables was determined in a flat parking lot using a radar gun. Multiple replicates were performed for each variable and a Student's t test was used to determine statistical significance. <b>Results</b> The car was significantly faster with the brushless electric motor compared to a motor with brushes. Adding weight to the car did not have a major effect on maximum speed of the brush containing motor but did have an effect on the maximum speed of the car with the brushless motor. Tire design also had a major effect on the maximum speed of the car, with soft rubber tire achieving a higher speed than a hard foam tire. Finally the size of hte pinion gear also had an effect on maximum speed, with larger gear producing the higher speed. <b>Conclusions/Discussion</b> The variable which had the biggest impact on the speed of the car was type of electric motor, followed by tire size and design, followed by gear size and then weight.	
<b>Summary Statement</b> The purpose of this project was to explore which of the many variables that go into designing cars had the biggest impact on maximum speed of the car.	
<b>Help Received</b> Father helped make measurements and proofed report.	