



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Cameron M. Noland	Project Number J0230
Project Title Which Temperature Is WD-40 the Most Effective in ABEC-5 Black Holl Ball Bearings?	
Abstract Objectives/Goals The objective of this experiment is to discover at what temperature WD-40 lubricant is the most effective on ABEC-5 Black Ball bearings for roller-skate wheels. Methods/Materials Fabricated industrial plastic racing cars were built in order to simulate a roller-skate wheel. This was need in order to be able to heat and test ball bearings. The cars were made of screws, spacers, fabricated industrial plastic, and ABEC-5 black-hole ball bearings. The racetrack was made of particleboard, pine wood, and crown staples. All sets of ball bearings were sprayed with WD-40 and assembled before heating and cooling. After each ball bearing had reached its desired temperature, the bearings were cooled to room temperature. Bearings were placed in the car and raced. One set of bearings was heated to 120°F in the oven. A second set was left at room temperature. The third set of bearings were placed in the freezer until the temperature reached 32°F. After this, the cars were placed on the track and cars were timed and visually placed in order. After each race, cars were moved over on the track to a different lane. The race were conducted 60 times each day for nine days. Results The bearings, which was heated consistently, reached the bottom of the track first with an average time of 2.57 seconds. The bearing, which remained, at room temperature, was second with the average time of 2.84 seconds. The car in which the bearing was frozen reached the bottom of the track with an average speed of 3.65 seconds. Conclusions/Discussion In conclusion, my hypothesis was incorrect that room temperature would perform at a faster rate than the other types of treated bearings. The WD-40 lubricant preformed better when the ball bearing was heated to a temperature of 120°F. The average difference of speed between the fastest and slowest cars was 1.08 seconds. I found that heating the WD-40 was more effective for use with roller-skate equipment. The WD-40 viscosity became thin; thus making the bearing run more efficiently.	
Summary Statement This project is about the effects of the the temperature of WD-40 and its use in ball-bearings.	
Help Received My father helped me build the race track and the race cars.	