



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Raymond A. Sarno	Project Number J0231
Project Title The Effectiveness of Industrial and Non-Industrial Lubricants on an Aluminum Bearing Surface	
Objectives/Goals My question was "Which lubricant will be most effective when applied to an aluminum bearing surface under 25 pounds of force?"	
Abstract Methods/Materials To conduct this experiment, I constructed an apparatus to test lubricants on a bearing surface. In this apparatus I included a control unit, a servo motor, displays, and inputs. I built the frame out of aluminum strut. I also wrote the program for the apparatus. To test each lubricant, I removed the weight assembly and applied one of the lubricants to both bearing surfaces and the shaft. I then ran the machine once to spread the lubricant around evenly. I tested seven different lubricants ten times each in this manner. I recorded the "spin-down" time for each trial (spin-down time is the length of time indicated on the machine from the moment the weight is released from the drivewheel to the time when the weight assembly stops spinning). The entire experiment was repeated four times.	
Results On average the most effective lubricant was Vaseline. However, in the first test, this lubricant had entirely spread off the bearing surface after its sixth trial! In subsequent tests greater amounts of each lubricant were used. The next most effective lubricant was Dow Corning 44. The other five lubricants tested also performed relatively well, but were significantly less effective than Vaseline or Dow Corning 44. After the first test, all of the lubricants had higher spin-down times by approximately 1-2 seconds. This was because in subsequent tests I applied more of each lubricant to the bearing surface.	
Conclusions/Discussion Although Vaseline was the most effective lubricant in my experiment, it would not be effective in an industrial setting because it spreads off the bearing surface quickly and would need to be re-applied too often. Dow Corning 44 is an effective all-purpose lubricant which can withstand a wide range of temperatures and pressures. In practice, most industrial lubricants are manufactured for a specific range of applications and vary in their versatility.	
Summary Statement I constructed a computerized apparatus to test the effectiveness of various lubricants on an aluminum bearing surface.	
Help Received Crescent Design Inc. Allowed me to utilize their machining equipment and much of their scrap parts.	