



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

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Project Title Dry Lubricants: A Quantitative Analysis of Friction Properties	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals To test several types of dry lubricants to determine which type of lubricant decreases the amount of friction required to move an object across a horizontal track. If non-powder dry lubricants are more effective at reducing friction than the powder dry lubricants, then the friction reducing properties of the non-powder dry lubricants should exceed those of the powder dry lubricants.</p> <p>Methods/Materials 1Cut steel strips into 8- 30.5 cm pieces and 8- 10.15 cm pieces using hacksaw and clamp 2File off sharp edges with grinder 3Clean all steal strips with lacquer thinner and rubbing alcohol.Let dry. 4Assemble pendulum mechanism with erector set. 5Attach a 10.15 cm strip to block and a 30.5 cm strip to track using double sided tape. 6Place block on track. 7Lift pendulum and place pin in second hole of weight. 8Pull pin quickly. 9The block will slide across the track. Record the distance traveled using square to measure exact distance the block traveled.(for no lubricant run)10Perform step 6-9 24 more times, for a total of 25 trials for each product. 11Repeat steps 4-10 applying the dry lubricant brand being tested (NOTE: the Diconite product is special process and was applied to the two steel strips by the Diconite Company).</p> <p>grinding wheel, clamp, 8- 30.5 cm steel tracks, 8- 10.15 cm steel tracks, 3.8cm x 6.4cm x 10.15 cm wood block, lacquer thinner, rubbing alcohol, paper towels, hack saw, wood base, erector set, pendulum weight, 30 cm ruler, role double-sided tape, 4 different powder dry lubricants, 3 different non-powder dry lubricants, carpenters square, scissors.</p> <p>Results The track and sliding block lubricated with the Diconite process yielded the block traveling more than twice the distance compared to the average of all other dry lubricants tested, implying that Diconite has the lowest coefficient of friction. The Teflon based lubricants (Solvay Solexis powder/Permalon 327 spray) had the worst results. All graphite based dry lubricants (Hob-E-Lube/Tube-O-Lube/Versa Chem) and dry impregnated lubricant (Militec-1) had similar data.</p> <p>Conclusions/Discussion After performing the experiment and analyzing the data, the quantitative results indicated that the non-powder Diconite process had a significantly higher average distance traveled over twenty-five trial runs, compared to all other dry lubricants tested. Based on the hypothesis, a non-powder dry lubricant had the lowest coefficient of friction (.030).</p>	
Summary Statement Determining which dry lubricant, either powder or non-powder form, has the greatest friction reducing properties	
Help Received I had supervision while using all dry lubricants.	