



California Science Center  
**CALIFORNIA STATE SCIENCE FAIR**  
**2001 PROJECT SUMMARY**

<b>Your Name</b> (List all student names if multiple authors.) <b>Brian A. Hamlin</b>	<b>Science Fair Use Only</b>  <h1 style="margin: 0;">J0112</h1>
<b>Project Title</b> (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) <b>Does Molybdenum Disulfide Make a Difference?</b>	<b>Division</b> <u>X</u> Junior (6-8) _ Senior (9-12)
<b>Preferred Category</b> (See page 5 for descriptions.) <b>10 - Materials Science</b>	
<p><b>Abstract</b> (Include Objective, Methods, Results, Conclusion. See samples on page 14.)          Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.</p> <p><b>Objective:</b> The objective is to determine whether molybdenum disulfide coated projectiles distort more than non-coated projectiles upon entering a material.</p> <p><b>Materials and Methods:</b> One .270 caliber firearm, three plastic containers to hold the bundles of newspaper, four bundles of newspaper, a stable bench to fire the projectiles from. Fifty handloaded cartridges, each handloaded cartridge had the same amount of powder and same weight projectiles, that were measured for length before loading. Half the projectiles were coated with molybdenum disulfide and the other half non-coated. The container of wet newspaper was set up fifty yards from the firing position. Ten molybdenum disulfide coated projectiles were fired into the newspaper keeping track of the order in which fired and where they entered the newspaper. Then the firearm was cleaned and this process once again repeated with ten molybdenum disulfide coated projectiles. Then following cleaning of the firearm the remaining five coated cartridges were fired into the newspaper. The firearm was cleaned and the same steps were repeated with the non-coated projectiles. The projectiles were then removed and remeasured for distorted length.</p> <p><b>Results:</b> Eight of the molybdenum disulfide coated projectiles when fired went through the paper and container into the embankment behind, leaving seventeen intact distorted projectiles. Five non-coated projectiles when fired went through the paper and container into the embankment behind, leaving twenty intact distorted projectiles. Since there were only seventeen coated recoverable projectiles the average of the first seventeen of the non-coated projectiles were averaged along side the seventeen coated projectiles. Based on the averages of the two types of projectiles the non-coated projectiles distorted more than the molybdenum disulfide coated projectiles by 0.0145 of an inch.</p> <p><b>Conclusions:</b> In conclusion the molybdenum disulfide does make a difference, but not in the same way as thought before. The data did not support the hypothesis which stated that the molybdenum disulfide coated projectiles would distort more than the non-coated projectiles. The non-coated projectiles distorted more than the molybdenum disulfide coated projectiles according to the recorded data.</p>	
<p><b>Summary Statement</b> (In one sentence, state what your project is about.)</p> <p>This project was performed to determine if molybdenum disulfide would make a difference in the amount of distortion on a high speed projectile versus a non-coated projectile upon entering a material that will retain the projectile.</p>	
<p><b>Help Received in Doing Project</b> (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.</p> <p>Father helped reload cartridges, perform test, measure distorted projectiles; mother helped with the board, typing project, taking pictures; and advisor, Daryl Amble, gunsmith, helped coat the projectiles with molybdenum disulfide to reload cartridges and suggested the use of wet newspaper.</p>	