



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

<b>Name(s)</b> Garron W. Ireton	<b>Project Number</b> <b>S0311</b>
<b>Project Title</b> <b>Shrapnel or Sorry: A Study of the Effects of Armor's Trajectories on the Effective Energy of a Projectile</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this project is to determine the effects of sloped armor on the effective energy of a penetrating projectile.</p> <p><b>Methods/Materials</b> Pellet gun, ballistic gel, stove, refrigerator, ruler, protractor, 1 cm thick particleboard armor squares. Shot thru armor squares oriented at various angles and into ballistic gel lying behind. Recorded subsequent penetration violence and distance into gel.</p> <p><b>Results</b> The greater the slope of the armor in relation to the pellet's path, the less penetration was achieved at the cost of greater violence of penetration.</p> <p><b>Conclusions/Discussion</b> It appears that while less penetration can be achieved with armor sloping, potentially worse damage can be caused by the more violent penetration associated with such sloping.</p>	
<b>Summary Statement</b> By testing the effects of armor sloping on the effective energy of a penetrating projectile, I found that sloping is a trade-off, causing less penetration but more spauling and shrapnel to occur.	
<b>Help Received</b> I designed and carried out the project myself. I received help with statistical analysis and some woodworking from Collin Ireton, an engineering sciences major.	