



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Garron W. Ireton	Project Number 36020
Project Title Shrapnel or Sorry: A Study of the Effects of Armor's Trajectories on the Effective Energy of a Projectile	
Abstract Objectives/Goals The objective of this project is to determine the effects of sloped armor on the effective energy of a penetrating projectile. Methods/Materials 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. Results 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. Conclusions/Discussion 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.	
Summary Statement 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.	
Help Received I designed and carried out the project myself. I received help with statistical analysis and some woodworking from Collin Ireton, an engineering sciences major.	