



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

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Project Title The Evaluation of Penetration Abilities of Various Slingshot Projectiles	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of our experiment is to discover which size and material of spherical projectile delivers the optimal (deepest) penetration into a block of foam, when fired from a slingshot. Our research suggests that a fairly small, mid-weight, projectile made of material with the greatest sectional density will penetrate deepest.</p> <p>Methods/Materials We made braces for the slingshot and the foam block to stabilize them both, so that a number of variables were eliminated. We shot a range of materials, and sizes for each material (wood, glass, candy, steel & lead). Originally, we shot one of each projectile for four trials, but to further confirm our hypothesis we ran an additional ten trials, graphing and interpreting the new data.</p> <p>Results We found that a small projectile with a medium mass and a high sectional density (our smallest lead ball) penetrated the best.</p> <p>Conclusions/Discussion A mid weight projectile penetrated best because it received the most kinetic energy from the slingshot. Higher densities usually penetrated better because they have more mass focused on a smaller volume. But sectional density (how much mass is in a given area) was a better indicator than density alone.</p>	
Summary Statement Our experiment evaluates the effects of mass, density and sectional density on the penetration abilities of various spherical slingshot projectiles.	
Help Received Mr. Bartel helped by explaining the physics to us, and by helping us to process our graphs. Mr. Houser helped us to construct the braces. Mrs. Houser helped with typing and editing.	