



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> <b>Bailey E.L. Stormes</b>	<b>Project Number</b> <b>J0326</b>
<b>Project Title</b> <b>What Are the Differences in Bullet Velocity and Penetration on Different Barrel Lengths of Guns?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My project was used to determine if barrel length affects bullet velocity and penetration. I believe that the gun with the longest barrel will have the highest rate of velocity and penetration.</p> <p><b>Methods/Materials</b> When conducting this experiment, three guns of the same caliber with different barrel lengths were used(Springfield Bolt Action .22 Rifle 24.25 in., Ruger .22 Rifle 18 in., Colt .22 Pistol 4.5 in.) Twenty-five shots were fired out of each gun for five trials while standing thirty feet away from the selected target. Frozen candle wax was used to measure the penetration of a projectile. Fifteen shots per gun were fired to measure the penetration of the bullets. The bullets used were XPERT HV .22 Long Rifle. A chronograph was used to measure the velocity of the projectile. A twelve inch ruler was used to measure penetration.</p> <p><b>Results</b> The gun with the longest barrel (Springfield Bolt Action .22 Rifle 24.25 in) had the greatest velocity out of the three selected guns. The gun with the mid-sized barrel length (Ruger .22 Rifle 18 in.) had the deepest penetration.</p> <p><b>Conclusions/Discussion</b> My conclusion is, the gun with the longest barrel had the highest rate of velocity with an average speed of 1069.656 Feet Per Second (FPS). The gun with the mid-sized barrel had the deepest penetration with an average of 4.9 inches. My hypothesis that the gun with the longest barrel would have the highest velocity was proven correct. However, the second part of my hypothesis stating that the longer the barrel the deeper the penetration was proven incorrect.</p>	
<b>Summary Statement</b> The affects of barrel lengths on the velocity and penetration of a projectile.	
<b>Help Received</b> Father and Mother took me to the range to shoot and supervise.	