



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Philemon Salib; Ben Schmidt</b>	<b>Project Number</b> <b>J0219</b>
<b>Project Title</b> <b>The Effect of Applied Temperature on the Accuracy of a 0.68 Paintball Projectile</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> "How will changing the temperature of a 0.68 paintball projectile (or in the case of the control, leaving it unaltered) affect its accuracy?" was the essential question that we attempted to solve.</p> <p><b>Methods/Materials</b> Materials: 1)CO2-Powered Paintball Marker w/ insulated temperature-controlled hopper (i.e. used to keep temperatures of paintballs from fluctuating due to surrounding environment)2)Insulated Thermal Containers 3)Oven 4)Freezer 5)Zap Deviant 50 Count Paintballs 6)Project vise Method: We placed a Tippmann #98 custom paintball marker, adjusted to a muzzle velocity of 280 feet per second, attached a 16-ounce CO2 tank attached, on a stationary project vise. Next we placed a 24# x 24# target, with a black dot placed in the center, exactly 50' from the barrel of the marker. An Aimpoint 1000 sight is placed on top of the gun so that the red dot is positioned directly on the center of the target. Next we prepared the paintballs by placing ten Zap Deviant paintballs in a freezer at 23 degrees Fahrenheit for thirty minutes, an additional ten in a refrigerator at 37 degrees Fahrenheit for thirty minutes, ten in an oven set at 85 degrees for thirty minutes, ten in the oven set at 100 degrees, for thirty minutes, and unaffected room temperature paintballs at 72 degrees that have been sitting at that temperature for 24+ hours. * Once prepared, we loaded the hopper of the paintball marker with ten prepared paintballs. Once this was accomplished, we fired ten shots at the target, with a 30-second rest in between each shot. We measured the distance of each shot from the black dot located at the center of the target. We cleaned the target and retrieved another prepared group of paintballs. We repeated the steps from the * to the previous sentence until all levels were completed.</p> <p><b>Results</b> Our results indicated that the paintballs that reached the highest temperature applied to them landed the closest to the black dot, hence having greater accuracy. We also found out that the unaltered room temperature paintballs performed with the least accuracy.</p> <p><b>Conclusions/Discussion</b> We believe our results to be so based on the particular statement cited in our research regarding a paintball's ability to conform better to the mold of the barrel when heated due to enhanced malleability. This allowed for a more aerodynamic, accurate, expulsion from the barrel. The precautions we took ensured that these results were reliable.</p>	
<b>Summary Statement</b> Our project delved into the depths of accuracy and ballistic applications to the paintball marker and its relative ammunition, the paintball projectile. with the use of temperature as our dependent variable.	
<b>Help Received</b> Timothy McFadden, a local armorer,"watched over" us during testing procedure to ensure that project stayed within legitimate limitations	