



**CALIFORNIA STATE SCIENCE FAIR  
2010 PROJECT SUMMARY**

<b>Name(s)</b> Spencer Jones; Gunner Little; Caleb Sager	<b>Project Number</b> <b>J0211</b>
<b>Project Title</b> <b>The Heat Is On: The Effect of Golf Ball Temperature on Distance</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of this study was to investigate the effect of golf ball temperature on the distance that the ball would travel upon impact. We predicted that when the golf ball is warmer it will travel a longer distance and when the golf ball is cooler it will travel a shorter distance.</p> <p><b>Methods/Materials</b> The methods employed in this study were to first build an apparatus that would allow us to consistently strike the ball with equal force at an equal angle. For each trial the hammer was raised to a consistent height, 4 feet, measured from the ground surface. Then the hammer was released so that it would rotate downward and strike a tee mounted ball driving it out onto a grassy surface. The distance that the ball traveled was measured with a tape measure and recorded. The measurement was taken from the tee to the center of the ball. A total of 9 golf balls were tested at three different temperatures: near 30° F, ambient, and near 200°F.</p> <p><b>Results</b> The average distance traveled was greatest for the golf balls at ambient temperature. The lowest average distance traveled was measured for the golf balls at the highest temperature.</p> <p>Consistent with our hypothesis, the golf balls at ambient temperature traveled farther than the golf balls at cooler temperature. Unexpectedly, the average distance for the heated golf balls was the lowest, even lower than the golf balls at near freezing temperature. It seems likely that at some high temperature the golf balls become soft and do not rebound when struck by the wooden hammer. The golf balls that were in the boiling water bath became soft enough that they flattened out on the bottom.</p> <p><b>Conclusions/Discussion</b> The outcome of our study suggests that warm golf balls travel further than cold golf balls, up to an undetermined maximum temperature. This result is consistent with the findings of the literature review that suggest that an increase in golf ball temperature enhances the elastic properties of the golf ball. The data suggest, however, that at an extremely high temperature, the golf ball's elastic properties are diminished. It is possible that the coefficient of restitution was effected, thereby, the warm ball may have recovered less kinetic energy. When this occurred, it is possible that the distance the golf ball was able to travel was compromised.</p>	
<b>Summary Statement</b> The purpose of this study was to investigate the effect of golf ball temperature on the distance that the ball would travel upon impact.	
<b>Help Received</b> Caleb's dad helped build swinging hammer. Gunner's mom helped with the display board.	