



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

<b>Name(s)</b> <b>Morgan A. Matzke</b>	<b>Project Number</b> <b>S0219</b>
<b>Project Title</b> <b>The Effect of Varied Tennis String Tension on the Coefficient of Restitution</b>	
<b>Abstract</b> <b>Objectives/Goals</b> This project will find the effect of varied string tension on the coefficient of restitution for tennis ball and racquet collision. The hypothesis is that if the string tension on a tennis racquet is changed, then the coefficient of restitution will be changed in proportion to the increase or decrease in tension. <b>Methods/Materials</b> A special test set up was built to repeatedly drop balls into racquets and capture the height of the rebound. <b>Results</b> Between five different string tensions, the height at which the ball rebounded varied by a small amount. Large measurement variations made data analysis difficult. With further reading, it was found that the coefficient of restitution of a tennis ball is much smaller than the string's coefficient of restitution. <b>Conclusions/Discussion</b> This lead to the conclusion that less string tension increases the collision coefficient of restitution and this was verified by experimental results. the hypothesis is accepted, and the coefficient of restitution is marginally affected by an increase or decrease in string tension.	
<b>Summary Statement</b> This project looks at the coefficient of restitution and, using error analysis to decipher the results, attempts to find out if a lower string tension actually causes significantly higher rebound heights for the tennis ball.	
<b>Help Received</b> Mother helped type report; Father taught me some physics; CAMS loaned me racquets; Advisor gave me good tennis advice; Sister helped clean up tennis balls	