



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Rachel C. Leuthold</b>	<b>Project Number</b> <b>S0106</b>
<b>Project Title</b> <b>Tuck to Win: The Effects of Aerodynamics on Speed Skiing</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The intention of this science project was to study the affect of aerodynamics on speed in speed skiing. I intended to compare an athletic stance, a high tuck, a low tuck with hands in front of my face, and a low tuck with hands below my face. <b>Methods/Materials</b> I assumed that the fastest times would belong to the stance that was both low, and had my hands in front of my face. I designed an experiment in which I took around seven runs per stance, and recorded the time at four points on the set distance. I created a cubic function from my data, and used derivatives to find the instantaneous velocity and acceleration. I attempted to test stances in a wind tunnel that I had built, but it did not work. <b>Results</b> My data showed that the low tuck with my hands in front of my face had the highest acceleration and velocity. <b>Conclusions/Discussion</b> In conclusion, the type of tuck a ski racer assumes can greatly affect their speed, and thus their results. The most effective tuck is low, with the hands positioned in front of the skier's face.	
<b>Summary Statement</b> I studied the aerodynamic properties of different tuck positions.	
<b>Help Received</b> Mr. Matt, my advisor; my dad filmed the runs, helped me drill and cut the metal tube for the wind tunnel; RockLogic and Alliance Gas Supplies loaned me materials.	