



**CALIFORNIA STATE SCIENCE FAIR  
2014 PROJECT SUMMARY**

<b>Name(s)</b> <b>Sophia L. Hodson</b>	<b>Project Number</b> <b>J1813</b>
<b>Project Title</b> <b>Physics and Figure Skating</b>	
<b>Abstract</b>	
<b>Objectives/Goals</b> Figure Skating and Physics  My objective was to find out if one goes faster in an axle jump with their arms above their head or with their arms tucked into their chest and why the speed varies, if it does.	
<b>Methods/Materials</b> I had two skaters of the same International Skating Institute (ISI) skating level each perform several of each kind of axle. I video taped them and then timed all the jumps from takeoff to landing. They both had the same size toe picks and they both had Harlick skates.	
<b>Results</b> Skater 2 was generally faster than skater 1 and both skaters landed the jump with their arms tucked in faster than with their arms above their heads.	
<b>Conclusions/Discussion</b> My conclusion is that when a skater is rotating with their arms above their head, the arms are slightly farther away from their body and they rotate slower. This is because the average radius of the rotating body is slightly higher and there is nearly no friction in the jump. Therefore the angular momentum stays the same so speed varies inversely with the average radius of the spinning body.	
<b>Summary Statement</b> Because I am personally learning to do an axle jump, I wanted to find out if a skater spins faster in an axle with their arms tucked into their body or with their arms above their head.	
<b>Help Received</b> I refused to let me mother help. I had no help at all with this project except for the skaters that let me video tape their axle jumps.	