



# CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

<b>Name(s)</b> Devon J. Bernsley	<b>Project Number</b> <b>J1203</b>
<b>Project Title</b> <b>Why Am Eye So Dizzy? Measuring Nystagmus to Explore Dizziness Reduction Strategies</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> This study examined the effect of sight and head position on a skater's dizziness after a scratch spin. The goal was to determine what strategies people could utilize to lessen dizziness.</p> <p><b>Methods/Materials</b> The skater performed a scratch spin in six different positions: head up eyes open, head up eyes closed, head forward eyes open, head forward eyes closed, head down eyes open, and head down eyes closed. Eyes closed was achieved by blindfolding the skater. After each spin, nystagmus length was measured. Each variation was tested three times.</p> <p><b>Results</b> Head position and sight affected the dizziness of the skater. Eyes open head down was the worst spinning position as it made the skater the most dizzy. Eyes open head forward made the skater slightly less dizzy. Eyes open head up was the best overall position as it caused the least amount of dizziness compared to all of the other variations. Eyes closed head forward was the worst spinning position with eyes closed. Eyes closed head down made the skater slightly less dizzy. Eyes closed head up was the best spinning position of the eyes closed variations as it caused the least amount of dizziness for the skater.</p> <p><b>Conclusions/Discussion</b> My experiment showed that the skater got the least dizzy when she performed the spin with her head up and eyes open. The skater was able to pick a focal point on the ceiling and watch that point while spinning. This is like spotting, which ballet dancers do when they spin. During the other spins with eyes open (head forward and head down) there was no set focal point for the eyes to "spot." As a result, the skater watched the world or her own feet spin, and this made the skater dizzier. When someone stops spinning, their eyes tell their body that they have stopped spinning, but the fluid in the semicircular canals (within their ear) continues to move and sends a "still spinning" message to the brain. These mixed messages cause the eyes to continue to look for a focal point. This causes nystagmus (involuntary eye jiggles). I measured the length of nystagmus after each spin as a measure of how dizzy the skater was. This experiment proved that skaters should spot whenever possible. However, if she cannot spot, she will be less dizzy if she keeps her eyes closed, as she will not watch the world or her own feet spin. Then, when she stops spinning, she will not get mixed signals from her eyes and the fluid in her semicircular canals.</p>	
<b>Summary Statement</b> Variations of head position and sight can provide useful techniques for the reduction of dizziness.	
<b>Help Received</b> My mother videotaped the trials.	