



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Nick D. Rhodes	Project Number S0326
Project Title Concussions: No More Counting Stars	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I tested a Riddell Attack helmet and see how it would hold up when I dropped a weight on it. The weight simulated the defensive player giving the hit and the helmet was the simulation of an offensive player taking the force of the impact in the head. I hypothesized that the helmet would probably become scratched but not dented or misshapen by the weight. I also predicted that the top of the helmet create the most impact.</p> <p>Methods/Materials I dropped a five pound weight on the helmet, starting at two feet from the helmet's highest point. After each drop I raised the height by two feet to four, then six and finally eight feet. At each drop I measured the ground with a ruler to see how far in the ground the helmet went. I started with fresh ground at every two foot interval. I did this routine with three different locations on the helmet. First I dropped the weight on the top of the helmet. The next test was on the left side of the helmet, and the final test was on the right side. I also dropped the weight once on the back of the helmet.</p> <p>Results When I finished testing the helmet, it showed to be in great shape. No dents or scratches existed, but there were deep impressions on the ground. When the weight hit the back of the helmet, the face mask dug straight into the ground, creating the deepest impressions. This disproved the second half of my hypothesis, but proved the first half.</p> <p>Conclusions/Discussion The sides of the helmet do a better job of diffusing the impact, whereas the top takes the impact in one location. This also means that when hit on the top of the head, the impact goes straight into the neck of a football player. The neck is safer when hit with side impact. The impact to the back of the helmet was by far the worst effects. These results are important because concussions are an ever-growing problem in high school, NCAA, and professional football leagues. There have been many rules instated to keep players safe. If we can see how the head is impacted, we can better design helmets to protect players of all ages.</p>	
Summary Statement This project examines the impact to a Riddell Attack football helmet to find the most dangerous place for a player to receive impact.	
Help Received Teacher guided the project in class and gramatically revised. Mom assisted with the design of the board and typing.	