



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <b>Timothy P. Heiduk</b>	<b>Project Number</b>  31008
<b>Project Title</b> <b>The Helmet Crisis: Do Helmets Effectively Protect the Brain?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of my project was to identify the side of a standard youth football helmet and a standard youth baseball helmet that most and least effectively protected the brain. I also identified which helmet, between the two, better protected the head overall.</p> <p><b>Methods/Materials</b> I used a Vernier 25-g accelerometer to measure the force felt inside the helmets. A styrofoam ball was used to replicate the human skull, where the accelerometer was placed through a hole that was drilled in one side of the ball. A six-pound sledgehammer applied force to the two helmets. I suspended this sledgehammer from a pull-up bar, drilling a hole through the side that had two meters of rope threaded through it.</p> <p><b>Results</b> The left side of a standard youth football helmet was the most effective at protecting the brain and the top side was the least effective. For the baseball helmet, the back side was the best and the right side was proven the worst. Overall, a standard youth football helmet better protects the head than a standard youth baseball helmet.</p> <p><b>Conclusions/Discussion</b> Two of my five hypotheses were proven correct. I correctly predicted that the football helmet would better protect the head than a baseball helmet. I also properly hypothesized that the top side of a standard youth football helmet would be the least efficient side of the five. I inaccurately foresaw that the front side of the football helmet would best protect the head for that helmet. Both of my predictions for the baseball helmet were incorrect. Like the football helmet, I hypothesized that the front side of the helmet would be the best and the top side the worst.</p>	
<b>Summary Statement</b> The focus of my project measures the effectiveness of helmets in protecting the brain from injury.	
<b>Help Received</b> Father helped set up project for data collection and helped research proper accelerometer to measure force.	