



Colorado Science and Engineering Fair

2024 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: Does the Amount of Helmet Pads Determine the Severity of Concussion?

Finalist's Name: Logan Drullinger

School and City: Liberty School, Joes

Sponsor's Name: Ms. Linda Fogale

Category: Biomedical Sciences (BMED)

Division: Junior (6th - 8th grades)

Abstract (250 words or less):

The purpose of this project is to determine if the type of pads in a helmet affects the severity of a concussion. Since current requirements call for pads to be updated regularly, and helmets be reconditioned to protect athletes, then the helmet equipped with newer pads, would produce less damage and a potential concussion resulting from the helmet being hit should be less severe. So first off for set up you have to find 4 helmets and a styrofoam head. Afterwards cut the foam head in half and hollow it out. Afterwards balloons full of gelatin were dipped into Black Acrylic paint to show the chip marks and set to dry. One it was finished, the balloons were filled up with gelatin. Next, the balloon is inserted into the hollowed out head and then inserted into the helmet. Once finished the helmet was dropped onto a force plate measured in newtons. The data was collected by opening the styrofoam head and then inspecting the damages. The damages were seen by chipped acrylic paint on the balloon. The data from the sizes of chips on the balloons was added onto a spreadsheet and graphed. The results were that the more pads the less the size of a concussion. The oldest helmet had the most pads so the results showed that it did the best out of all of the helmets the newest helmet had lesser amounts of pads in the helmet so it did the worst out of the group.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature: *Logan Drullinger*

Date: *3/4/24*

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. A signed copy of this form must be included in your notebook.