



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Alex Alvarez	Project Number J0302
Project Title Stop Hoof Harassment	
Abstract Objectives/Goals The objective of this study was to find a safer way to attach horse shoes to horses hooves. Metal nails are most commonly used to adhere shoes to horses, but the nailing process can cause serious injuries, such as laminitis. My goal was to find alternative methods for shoeing horses that would be safer and effective. Methods/Materials Scale, segments of nylon cutting boards to simulate horse hooves, 5-inch-long metal horse shoes, horse shoe cleaner, industrial Velcro, industrial glue (epoxy), and nailers nails. Used scale to measure the effectiveness of different adhesion of horse shoes to the simulated hooves. Results Three trials were conducted using Velcro, glue, and nails to adhere five-inch horse shoes to segments of plastic cutting board, a material closest to a horse hoof. A scale measured how much effort it took to remove the shoe from the material and checked the damage it did to the material. The results showed that the nails adhered the best, but also did the most damage when removed. Velcro was the second best in terms of effective adhesion and caused less damage than nails when removed. Glue was the least effective. Conclusions/Discussion I wanted to prove that nailing shoes on horses hooves is the wrong way to go, and design an alternate product. As part of the product design, I wanted to find a safer method for the horse shoe-applying process. I glued, attached Velcro, and nailed five-inch horse shoes onto a material closest to horses hooves. My hypothesis was incorrect in which would be the most effective materials and method to attach a shoe onto a horse. I predicted the glue would be strong enough for a horse without damaging the hoof, but the Velcro proved to be the best. Although my results did not support the hypothesis, my project did identify safer, effective options for shoeing horses. Velcro horseshoes would be an effective product and safe alternative to nails when attaching horse shoes to horses.	
Summary Statement My goal was to find alternative methods for shoeing horses that would be safer and effective.	
Help Received My biology teacher helped me refine my project and gave suggestions on how to execute it effectively. I conducted the experiments myself.	