



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Rachel P. Hallmark	Project Number J1311
Project Title Exploring Rust Prevention	
Objectives/Goals I tested to see what household substances would be the best at preventing rust. My hypothesis is that that the oil and cornstarch mixture will prevent rust the best because, according to my research, oil does not mix with water and the cornstarch will make the oil thicker causing it to stick to the steel better than oil alone. Research indicates that corrosion of steel via rust is very costly to our societies and can endanger lives. New ways of preventing rust can possibly can both money and lives.	
Abstract	
Methods/Materials I explored multiple substances as barriers to rust on 30 5cm long 6.35mm diameter steel rods. I cleaned and labeled each rod and tested the following four substances: vegetable oil, a vegetable oil and cornstarch mixture, sunscreen and melted candle wax. Six trials for each condition, and a control, were tested. For six days I sprayed the pieces of steel with water in the morning and evening. After six days, the amount of rust created was measured by asking three family members to estimate what percentage of the steel below the 3cm mark had rust.	
Results My results showed the oil and cornstarch mixture was the best at preventing rust vs. the other conditions. The median percentage of steel covered with rust for the control condition (no additional coating) was 71%, the median for the oil and corstarch mixture condition was 1%, the median for the wax condition was 9%, the medion for the oil was 14%, and the median for the sunscreen was 38%.	
Conclusions/Discussion There are multiple household substances which can be applied to steel to prevent rust, but a combination of substances (such as oil and cornstarch)w as the most effective. Exploring ways to prevent rust through combining low cost substances could be effective at both preventing rust in real world applications and saving money through improved longevity of things made from steel.	
Summary Statement I tested to see what household substances prevented rust the best.	
Help Received My father, mother and sister assisted by estimating the percentage of rust on each rod of steel. My father cut the steel rods for me. My mother melted the wax for me. .	