



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Yonatan Rafael	Project Number S0226
Project Title The Effect of Time and Temperature on the Strength of a Seal on a Plastic Packaging Bag	
Abstract Objectives/Goals The objective of this study was to determine the optimal temperature and time to seal a bag and achieve the maximum strength. Methods/Materials This experiment tests different temperatures (210-350 degree Fahrenheit) and times (1-9 seconds) to find the ideal conditions in which a perfect seal on a packaging ba was made. I used a Vertrod Packaging Machine to make 10 trials of each seal, the more washers each seal held in my measuring device, the stronger the seal. Results After conducting all the tests, the optimal temperature and time was 270 degrees Fahrenheit and 8 seconds. It produced seal strength of 23.33 washers. This temperature was the strongest, because the perfect amount of heat, not too little and not too much, was applied on the plastic bag, while the machine pressed. My results showed me that time was a non-factor as an independent variable. Conclusions/Discussion In conclusion, the optimal temperaure was 270 degrees Fahrenheit. This temperature makes the strongest seal. Time is not a factor to achieve the maximum strength.	
Summary Statement This project tests different temperatures and times in order to find the optimal conditions to make the strongest seal on a plastic packaging bag.	
Help Received Serge Berguig assisted in supplying me with the tools I needed, and the facility I worked at. He helped assemble my tests, and supervised my accuracy.	