



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Mark T. Nakata	Project Number S0511
Project Title Walking on Water: A Study of Surface Tension	
Abstract Objectives/Goals The objective of this project is to investigate the property of surface tension of liquids and to determine how it is affected by rising temperatures and detergent additives. I hypothesize that in both cases, the surface tension will decrease. Methods/Materials I constructed a single beam balance. I used the balance to record the number of drops of water needed to pull a needle out of the fryer containing water at different temperatures. I ran ten trials at nine different temperatures. The test was repeated using corn oil. I then added detergent in 1 ml increments from 0 ml to 10 ml, to a cup of room temperature water and used the beam to record the number of drops needed to pull the needle out of the solution at each ml of detergent added. I ran 10 trials at each ml. Results I converted the number of drops into surface tension and found that at every temperature, the surface tension of water was greater than that of corn oil. The surface tension of both liquids decreased linearly. The surface tension of the detergent solution also decreased linearly for the first 2 ml; then it remained unchanged between 2ml and 10ml of added detergent. Conclusions/Discussion The experimental results supported my hypothesis. The results suggest that adding an extraordinary amount of soap to an extremely dirty load of laundry will accomplish nothing since surface tension is directly related to cleaning potential. With increasing temperature and pollution, it is very important to study the effects of detergent and temperature on surface tension since it plays such a vital role in our world.	
Summary Statement My project explores how rising temperatures affect the surface tension of liquids and examines the effect of detergent additives on water surface tension.	
Help Received Mother helped produce EXCEL graphs and assemble the backboard; Mr. Hunt , my biology teacher, lent me laboratory supplies; Father helped pay for everything.	