



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Monica L. Chen	Project Number S0905
Project Title Optimum Sodium Phosphate Concentration for Oil Bioremediation	
Abstract Objectives/Goals This project was designed to identify the concentration of sodium phosphate tribasic at which oil-degrading bacteria would most effectively remediate oil-contaminated water. By pinpointing this concentration, biostimulation of oil-degrading bacteria can be maximized using a preset level of nutrients which can enhance microorganisms digestion of hydrocarbons. Oil spills, ubiquitous catastrophes in recent times, can be handled cost-efficiently using this method, without the production of toxic byproducts. Methods/Materials Six containers were filled with a constant amount of water, oil, and oil-degrading microbe suspension. Then, varying amounts of Na_3PO_4 were added to the containers, starting from 0ppm in the control and thereon increasing by increments of 500ppm until the highest dosage, 2500ppm, was applied to the last container. Every 4 days, starting from Day 2, samples were taken to a laboratory for analysis of remaining hydrocarbon. Results Laboratory analysis revealed that the container with 2500ppm of Na_3PO_4 had the least amount of hydrocarbons remaining. Other containers also presented substantial evidence that Na_3PO_4 can boost the performance of the bacteria, speeding up oil degradation. Some anomalies were present in the data, so scatter plots with trend lines were created to show the relative rate of hydrocarbon loss. Conclusions/Discussion The remaining amount of hydrocarbons in the containers implied that the higher the Na_3PO_4 concentration (less than 2500ppm), the higher the amount of hydrocarbons degraded. During the conditions that prevailed in this experiment, 2500ppm of Na_3PO_4 was found to be the optimum concentration necessary for the degradation of oil in water by certain bacteria.	
Summary Statement Various concentration of sodium phosphate were applied to containers holding an inoculum of oil-remediating bacteria and oil to find the concentration at which the most amount of oil degradation occurs.	
Help Received Mom bought supplies and drove me around and delivered samples; Mr. Carr introduced me to several experts and allowed me to use his lab to execute my experiment; samples analyzed at Associated Labs; Dr. Faad Hashemi helped with project design; Mr. Starodub guided in research process	