



CALIFORNIA STATE SCIENCE FAIR

2015 PROJECT SUMMARY

Name(s) Abigail M. Hooper	Project Number J1111
Project Title Lead Should Be Dead	
Objectives/Goals The purpose of this experiment was to prove the soccer fields I practice on don't have harmful levels of lead (Pb) in the soil.	
Abstract Methods/Materials Materials included: Soccer fields, soil samples, Pb test kit, containers, timer, scoopers, and labels. Method: Collect soil samples from three soccer fields. Test each sample multiple times by 1) filling test tubes half way with dry soil, 2) mixing ~ 1 table spoon of reagent (testing chemical solution) and shake for 30 seconds, 3) dip a test strip in the mixed soil/reagent for 5 seconds, 4) secure test strip for the minutes needed to see if there is Pb, 5) swish test strip in 4 ounces of tap water for 5 seconds, 6) match the color on the test strip with the color on test kit label to determine the amount of Pb. With the test strip colors (9 tests) seeming to be the same from my point of view, conveying high levels of Pb contamination, I was concerned and had the samples further tested by a professional lab.	
Results I originally performed 7 tests on 2 different soccer fields using a web-based test kit and the results were either inaccurate (I couldn't tell a difference in colors on the test strips) or had significant Pb contamination (higher than 400 ppm which the test strip was conveying, with 300 ppm being my acceptable reference point based on a study by the University of Massachusetts). Being concerned, I added a third soccer field to the sample-set and decided to try a professional lab for Pb concentration. The results from the lab were accurate and indicated each soccer field had safe Pb levels of 23 ppm, 29 ppm and 45 ppm.	
Conclusions/Discussion My hypothesis of low Pb levels in the three soccer fields I practice on was correct; measuring 23 ppm, 29 ppm and 45 ppm. I defined below 300 ppm of Pb in soil being an acceptable concentration level based on a study done by the University of Massachusetts. This makes sense because two major contaminants have been banned or properly managed; lead paint (1978) and leaded gasoline (1995). The original test kit I used from the web did not work in my opinion. The color variation between test strips was not visible enough to draw a proper conclusion. A professional lab produced results with a high level of accuracy.	
Summary Statement Confirming the soccer fields I practice on do not have harmful levels of lead (Pb) in the soil.	
Help Received Parent provided: transportation, helped with computer forms (application), printed pictures and purchasing the web-based test kit	