



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Sean T. Carroll	Project Number 31764
Project Title Toil with Soil: Is There a Relationship between Soil Color and Its Iron Content?	
<p align="center">Abstract</p> <p>Objectives/Goals My objective was to determine if the color of soil can predict the presence of iron.</p> <p>Methods/Materials Materials: 1 each of ACE Hardware paint color cards of all brown tones; 5 samples of ¼ cup each of red (clay), yellow (sandy), and brown (loam) soil purchased from Science Kit and Boreal Laboratories; Nine Bowls, 473.1 mL; 1 set KitchenAid measuring cups; Nine Kirkland Brand Paper towels; One 2# Almico Horseshoe Magnet style #07225 from The Magnet Source; Nine pieces of 12 inch string-Ace Multi-purpose Twine #24 twisted cotton, Light load 3lb. limit; 4.262 Liters Water; One triple beam balance scale Procedure: A. Match each soil sample to its corresponding shade on paint cards B. Weigh one clean paper towel and record C. Measure ¼ cup soil from the soil sample D. Fill up a bowl with 1 cup of water and ¼ cup of soil and mix for 30 sec. E. Put a strong magnet on a string and dip it in the water, move it slowly around the bowl F. After a minute, pull up the magnet and wipe it on a paper towel. G. Weigh the paper towel and its contents in grams and record weight on paper H. Subtract the weight of the clean paper towel from the paper towel used to wipe off the magnet to get the iron weight and record I. Repeat steps C through H three times for each of the three soil samples: Brown loam (Wild Wild West); Red clay (Outpost); Yellow sandy (Wagon Wheel)</p> <p>Results Surprisingly, the brown loam soil (Wild Wild West) had the lead in the highest iron content by a significant amount of iron. The second highest amount of iron was the red clay soil (Outpost) and the least amount of iron was the yellow sandy soil (Wagon Wheel).</p> <p>Conclusions/Discussion Conclusion: My conclusion is that my hypothesis was not proved and brown soil had the highest amount of iron. Discussion: Two soil layers called horizons are named topsoil and subsoil. Top soil is mostly decomposed and organic materials and subsoil consists of mineral deposits, clay and bedrock. These soils are a variety of colors and the color can tell us about its chemical composition. A soil red in color usually indicates a high amount of iron in the form of iron oxide. The data in my experiment shows that it would be smart to test soil before making an assumption that only red soil is high in iron. There may be other factors affecting the soil color. Farmers and geologists could save time and money by testing their assumptions before planting or mining.</p>	
Summary Statement This experiment tests whether you can predict a high iron content based on the color of soil.	
Help Received Mother helped type report, helped design board and purchased materials. Teacher helped with editing.	