



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

<b>Name(s)</b> <b>Antonia B. Perez</b>	<b>Project Number</b> <b>J0811</b>
<b>Project Title</b> <b>Analyzing the Effects of Temperature and Soil Type in Absorption and Capillarity of Soils</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of my project was to determine if different soils had different absorption and capillarity rates and if environment temperature affects those rates.</p> <p><b>Methods/Materials</b> samples of loam, sandy, and potting soil, beakers, test tubes, water, incubator, refrigerator, and room temperature environment Take one glass tube and fill it with 20 grams for either sand, and loam, or 5 grams for potting soil. Repeat this for each soil, for each temperature setting, for at least 10 trials. Cut each cotton ball in half and plug the half into the top of the glass tubes. Make sure that, when turned upside down, the cotton ball will stop any of the soil from falling out. Take all the glass tubes in one soil set and tie them together firmly with a rubber band. Make sure all the soil sets are tied together and no tubes are loose. Take a soil set and turn it upside down so the opening of the tube, which is stopped with a cotton ball, is facing down. Fill a glass beaker with 300 ml of water and pour food coloring into the water based on the temperature of the environment the glass tubes and beaker are going to be in. Upside down, vertically immerse the glass tubes into the glass beaker with colored water. Put the glass beaker filled with the tubes into either a room temperature environment, a refrigerator, or an incubator (each soil will be in all the environments for testing). Allow the soil to sit in its environment and absorb the water for (5) five days to a week. Record the height the water traveled in the tube, and record how much mass the water added to the total mass of the tube with soil.</p> <p><b>Results</b> Overall, loam soil has the highest capillarity (103%) and absorption rates (22.6 mL of water) . Potting soil had the lowest capillarity (25.6%) and absorption rates (5.2 mL of water). Temperature was an inconsistent factor.</p> <p><b>Conclusions/Discussion</b> In conclusion, from this project, I learned that loam soil has the best capillarity and absorption factors. The potting soil had the worst capillarity and absorption, while the sand soil was in between. These soils are found all around the world and are used regularly. If soils are chosen more carefully, the world could have more water, and California might stop a drought. This is why the results of my project on soil capillarity and absorption are important and can affect us in many ways.</p>	
<b>Summary Statement</b> I discovered that the loam soil had the highest absorption and capillarity results and temperature did not really affect my results in a consistent manner.	
<b>Help Received</b> Jewely Lickey, Science teacher at Sanger Academy Charter School provided lab equipment Robert Nelson, Science teacher at Sanger Academy Charter School provided soil samples	