CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
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Project Number
J0602

Project Title
What Effect Does Soil Particle Size Have on Water Absorption?

Abstract

Objectives/Goals
My goal was to test the absorption ability of different soils in the local area. I thought that soils which were heavier in sand would absorb more water. I also hypothesized that the more absorbent the soil, the closer it would be located to the riverbed (dry). From my research, I learned that the finer a soil is, the more eroded it has become. Based upon this, I felt that the older, more eroded sands of the riverbed would be the most absorbent.

Methods/Materials
I collected soil samples from the local area, to include riverbed samples. I poured a set amount of water on each sample. I controlled the amount of time each soil was exposed to water. The water left on the top of the soil was poured off and measured as "run-off." The remainder of the water was calculated as absorbed.

Results
Results showed that the higher the gravel content of a soil, the higher is its absoption; less water was collected as run-off in gravel samples. The higher the silt content of a soil, the lower is its absorption; more water was collected as run-off.

Conclusions/Discussion
Results were not exactly what I'd expected. The sands in the riverbed were not the most absorbent soils in my trials. I had not given enough attention to gravel when I formulated my hypothesis. Gravel is the most absorbent soil material. However, it is not in great supply in riverbed samples because riverbeds experience greater erosion over time.

As soil texture increases in size, so does its ability to absorb water. Because we depend on underground water sources in our desert, I thought that the sands in the riverbed would and act to absorb water quickly, allowing it to pass into underground aquifers. While the riverbed soil was not the fastest at absorbing water, neither was it the slowest. From my research, I also learned that this could be due in part to a natural filtering capability of graded sands. It would be necessary to have a moderate absorption rate to allow filtering to occur while maintaining water absorbency.

Summary Statement
As a soil increases in particle size, so does its ability to absorb water.

Help Received
Teacher acted as facilitator.