



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Kristi M. Tamaki	Project Number J0928
Project Title Can Mother Nature Clean Her Water?	
Objectives/Goals My objective was to learn if permeabilities of different earth materials affected the quality of water.	
Abstract Methods/Materials 6 plastic water bottles; 6 plastic cups; size variety of plastic beakers; stopwatch; exacto (craft) knife; thermometer; styrofoam cooler; water testing materials; 3000 mL sample of creek water; 1800 mL of sand, gravel, soil, clay, bark, activated carbon First, I created the three bottle stands, prepared the bottles, and put 250 mL of each earth materials (6) into the six different bottles. Then I placed them (nozzle down) on the stands with a cup under each one before I tested the creek water for nitrate, phosphate, bacteria, and turbidity. After, I ran 500 mL of creek water through each of the materials; timing them so that I could calculate the permeability (mL/sec). To do this, I also had to measure the amount of water that went through the material. Lastly, I tested the water after the run-through for nitrate, phosphate, bacteria, and turbidity five times and calculated the average for each.	
Results The results of my experiment illustrated that the permeability of different earth materials does affect the quality of the water in different ways. The gravel had the highest permeability (water traveled the fastest through it) followed by bark, the activated carbon, sand, soil; and lastly the clay. The nitrate tests overall showed that after the run-through the purity got worse and further, that the higher the permeability or flow rate, the better the overall quality. The bacteria and turbidity tests also expressed that the quality got worse after the run-through. The phosphate test showed that the qualities improved after the run-through except for gravel, which got worse, not depending on the permeabilities.	
Conclusions/Discussion The data disproved my hypothesis that the lower the permeability the better the quality of the water. This information helps people know that water still has to be cleaned with chemicals because Mother Nature can't always do it on her own. These results also show that the majority of the time water runs through the ground it picks up contaminants rather than leaving them in the ground.	
Summary Statement My project is about how the earth naturally cleans or contaminates water through permeability.	
Help Received Step-dad helped build bottle stands; water testing materials borrowed from Watershed Resource Center in Santa Barbara; Mother helped glue down information on display board	