



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Shamik Mascharak	Project Number J0522
Project Title Are Copper Pipes a Significant Source of Copper in Drinking Water?	
Abstract Objectives/Goals The goal of this project was to determine the extent of copper contamination in drinking water due to the use of copper pipes. Also, the effect of the acidity of water on the amount of leached copper was examined. Methods/Materials Materials: Copper pipes, new and old, PVC pipes, Brass pipes, all 6 inch long, plugged at one end; Copper reagent from Hach Co. (CuVer reagent); Color comparator; Color wheel; Sample holder (Hach Co.); pH paper; Safety Glass. First, the pipes were numbered and placed on the rack. Then they were filled with tap water (pH 6) and water of pH 4 and 3 (by adding nitric acid). Every 2-3 days, 5 mL aliquots of the water samples were taken out. Each sample was mixed with a pillow of the CuVer reagent and shaken. The intensity of the purple color thus generated was then compared with the purple hue on the Hach color wheel. Since the intensity of the purple color is proportional to the concentration of copper in the water sample, the amount of copper leached out after a certain period of time was directly determined from this experiment. Results The results demonstrated that copper did leach out of the copper pipes and acidic water enhanced the rate of leaching. Old copper pipes showed more contamination than the new pipes while brass pipes showed moderate amounts of copper in the water. Conclusions/Discussion The amount of copper in drinking water does increase to a significant level (above the EPA standard of 0.3 ppm) upon standing in copper pipes overnight. The concentration of copper goes up with days and hence water should be drained especially after no usage of the faucets for a long time (like vacations). Such problems will be more prominent in houses with old copper pipes. Excess copper could cause gastrointestinal disturbances, nausea and other physical disorders. People with Wilson's disease would be especially susceptible.	
Summary Statement My project is about how copper is leached out of copper pipes and contaminate our drinking water.	
Help Received My dad, Pradip Mascharak, helped me in getting the chemicals, the pipes, and the Hach Kit. My sister, Smita, helped me in making the graphs.	