CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
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Project Number
J0528

Project Title
The Future is Now! Pee-ure Water

Abstract

Objectives/Goals
The purpose of my science fair experiment was to help the people who might plan a manned trip to Mars. It is intended to find the best way to recycle urine so the astronauts would be able to have water without costing the space station a lot of money and cargo weight.
I discovered I could recycle urine by the natural processes of evaporation, condensation & transpiration.

Methods/Materials
Funnel urine collected over a 3-week period (2 gallons) into a glass flask and place a rubber stopper into it. Connect the flask to a condensing tube, and the tube to another flask with an arm extending from it. Attach a rubber tube to another flask. Place the flask with the urine on a hot plate and let it boil. After about 10 minutes, H2O will collect in the flasks. Place this H2O in a test tube to keep it in a safe place and repeat the boiling process. Feed 1/4 of the urine to green bean plants to cause the transpiration process. Feed 1/4 of the evaporated & condensed urine to the 2nd set of plants so they can transpire this H2O, too. Place the different waters in their respective clear plastic cups to compare the clarity (& odors) of the samples.

Results
On a scale of 1 to 10 (1 = dirtiest sample compared to drinking water and 10 being the clearest), "evaporation & condensation" scored a 7, "transpiration" = 4, & "evaporation, condensation & transpiration" = 1. The "evaporation & condensation" was the simplest & most efficient. The transpiration was successful, but produced less than a ml of water. I did not produce enough evaporated & condensed water to feed to the plants so the "evaporation, condensation, & transpiration" did not work.

Conclusions/Discussion
My hypothesis that the "Evaporation, Condensation & Transpiration" would score highest was incorrect. It scored a 1. No H2O was produced because I did not feed it enough "evaporated & condensed" H2O. I only fed it 5 ml of "evaporated & condensed" H2O. Had I used 750 ml of evaporated and condensed H2O like I did with the pure urine, I probably would have received at least some H2O. I think the problem lay in the amount of H2O I collected when I was evaporating & condensing urine.
The reason the plants were not able to transpire properly is due to time constraints. If I had more time, I could have evaporated and condensed more water, thus giving the plants more sustenance to transpire.

Summary Statement
The purpose of my project is to determine the best way to recycle urine into water.

Help Received
Mom - board layout, typing, purchase of seeds and soil. Mr. Minton - use of lab equipment at Holy Family School. Chancey Kelly - assisted during recycling process