



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Kelly C. Kean	Project Number J1419
Project Title A Wrinkle in Time	
Abstract Objectives/Goals I read a short article which discussed why the skin wrinkles in water. I wondered, would the skin on a finger "wrinkle" at the same rate in ocean water as it did in fresh water? I designed an experiment to test the effects of "wrinkling" in room temperature, distilled water; room temperature distilled water with Epsom salt (10 % concentration); room temperature ocean water (3.5 % concentration); and 40 degree Celsius (warm), distilled water. Methods/Materials Materials and Methods: Ten subjects soaked their hands in 1.5 liters of the water samples until wrinkling occurred. The time was noted and fingers were photographed using a microscope attached to a computer. A delay of 30 minutes was allowed for the skin to return to normal before testing with another water sample. Results Results: Warm, distilled water was quickest to wrinkle the skin. Distilled water with Epsom salt caused rapid wrinkling also. Distilled water at room temperature came in third. The ocean water samples did not cause wrinkling within the two hour time limit, except in one subject. Conclusions/Discussion Conclusions: The warm, distilled water, a hypotonic environment, allowed the water to penetrate the skin rapidly, resulting in wrinkling. In an opposite reaction, the hypertonic environment of the Epsom salts may have drawn water out of the cells, causing the outer layer of skin to be "too large" and also become wrinkled. In general, the bigger the subject, the longer until wrinkling occurred, perhaps due to a smaller surface area to volume ratio. The thickness of the skin might also be a factor, but testing this was outside the scope of this experiment.	
Summary Statement This experiment was designed to test the rate at which the skin wrinkles in distilled water, ocean water, water with Epsom salt, and warm, distilled water.	
Help Received My mother supervised my experiment with human subjects at home. My science teacher lent me her Intel microscope to view the results.	