CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
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Project Number
J0617

Project Title
The HEAT Is On! A Comparison of Heat Retention in Salt Water and Fresh Water Samples

Abstract

Objectives/Goals
The objective was to determine whether fresh water holds heat longer than salt water. I think that the salt water will hold heat longer than fresh water because salt water has a lower specific heat index.

Methods/Materials
250 mL glass Anchor measuring cup; stainless steel beaker; thermometer; timer; pH paper; 250 mL salt water per sample testing;250 mL bottled spring water (fresh water) per sample testing; stove; large bucket. Step 1: Collect salt water sample from the ocean into the large bucket. Step 2: Pour out 250 mL salt water into measuring cup. Step 3: Test pH level. Compare color with guide after 30 seconds. Step 4: Transfer water to the beaker and heat water to 100°C (boiling point). Step 5: Insert thermometer. Record temperature. Step 6: Remove measuring cup from heat. Step 7: Record temperature at the following intervals: 1 minute, 2 minutes, 3 minutes, 4 minutes, 5 minutes, 10 minutes, and 15 minutes. Step 8: Rinse measuring cup. Step 9: Pour out 250 mL bottled fresh water into measuring cup. Step 10: Repeat steps 2 through 8 for nine additional salt water samples. Repeat steps 9 and 3 through 8 for nine additional fresh water samples.

Results
The mean average temperature of the ten salt water samples at minute 1 was 86.08°C. The mean temperature at minute 2 was 75.85°C. The mean temperature at minute 3 was 70.21°C. The mean temperature at minute 4 was 65.89°C. The mean temperature at minute 5 was 62.28°C. The mean temperature at minute 10 was 54.71°C. The mean temperature at minute 15 was 49.23°C.

The mean average temperature of the ten fresh water samples at minute 1 was 84.31°C. The mean temperature at minute 2 was 75.82°C. The mean temperature at minute 3 was 68.38°C.The mean temperature at minute 4 was 61.5°C. The mean temperature at minute 5 was 57.49°C. The mean temperature at minute 10 was 48.83°C. The mean temperature at minute 15 was 41.93°C.

Conclusions/Discussion
In conclusion, my hypothesis was correct. I predicted that the salt water samples would have a higher average temperature at the end of the fifteen minute data collection period. The salt water samples had an average temperature of 49.23°C at the end of fifteen minutes, and the fresh water samples had an average temperature of 41.93°C. This is a difference of 7.3°.

Summary Statement
My project is a comparison of heat retention in salt water and fresh water samples.

Help Received
My parents assisted with the Excel graphs, proofreading my report drafts and taking photographs of my data collection process; my neighbor Ralph Miljanich loaned me his beaker that enabled me to heat the water directly on the stove. Lastly, my advisor, Mrs. Julie Paz provided continued support and