CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
Jonah P. Tenenbaum

Project Number
J0627

Project Title
How Low Can You Go?

Abstract

Objectives/Goals
The objective is to analyze why salt is used to melt ice on roads and determine how salt lowers the freezing point of water and to prove the hypothesis: If water is mixed with salt, then it will freeze at a lower temperature than water without salt.

Methods/Materials
Three plastic cups were filled with 8 ounces of distilled water and different concentrations of sea salt. The control held only one cup of distilled water, while the other two cups had 1 or 2 tbsps of salt dissolved into them. All three cups were placed in the freezer and then the temperatures of each cup were measured by a food thermometer and recorded at timed intervals of 20 minutes until ice formed and the temperatures were stable. The data from three trials were averaged.

Results
The cup with 2 tbsp of salt froze at the lowest temperature with an average 14.7ºF, the water with 1 tbsp of salt froze at an average temperature of 22.5º, and fresh water froze at an average temperature of 30.6ºF. As shown by the data, the water with 2 tbsp of salt froze at the lowest temperature, the water with 1 tbsp of salt froze in the middle, and the fresh water froze at the highest temperature.

Conclusions/Discussion
According to the data collected, the hypothesis appears to be supported. The water did freeze at a lower temperature when salt was added to it in all three trials. The experiment supports the real life application of using salt to prevent and/or clear ice on roads, because salt lowers the freezing point of ice below the temperature of the surrounding area.

Summary Statement
My project investigates why salt melts the ice on roads and/or prevents it from forming by lowering the freezing temperature of the water.

Help Received
My parents bought supplies, revised the document and the board. Mr. Joseph (my science teacher) gave me ideas for edits.