CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
J0718

Project Title
How Does Carbon Dioxide Affect Air's Rate of Temperature Change?

Abstract

Objectives/Goals
The purpose of my experiment was to observe carbon dioxide as an essential contributor to global warming, and to accurately model how in the near future, the amount of carbon dioxide in the atmosphere will correlate to an abrupt spike in atmospheric temperature. Once I began my experiment, I expected to see a sudden increase in temperature in the environments containing the highest amounts of carbon dioxide.

Methods/Materials
Materials:
- Four jars with lids
- Four Temperature Probes
- Laptop with Data Studio Program
- Drill
- Dry Ice

Methods

I decided to set up a series of four jars, each containing a progressively larger amount of carbon dioxide in the form of dry ice. The amount in each jar corresponded to research I had done. I used heating lamps as a light source in substitution for the Sun, as it provided a constant and non-varied amount of heat. Over time, I analyzed the temperature change each atmosphere experienced over the coarse of 11,000 seconds.

Results
Each jar had an initial temperature of 5 degrees Celsius, and each resulting temperature told a story. Group A, my control group, in which no dry ice was used, had actually decreased in temperature over time. Group B, the jar representing the year 1900, slightly increased over time. Group C, the jar representing the year 2006, significantly increased over time. Finally, Group D, the jar representing the hypothesized atmospheric concentration of carbon dioxide in the year 2100, experienced a pronounced spike in temperature. This group had a final temperature of 76 degrees Celsius. This concluded the results of my experiment.

Conclusions/Discussion
Based on my results, I can confidently say that carbon dioxide is certainly contributing to global warming, and that the more carbon dioxide that is present in the atmosphere, the more extreme the effects are.

Summary Statement
I used glass jars, dry ice, sun lamps and computer-controlled temperature probes to investigate how the amount of carbon dioxide in the atmosphere affects the speed and severity of atmospheric temperature increase.

Help Received
Mr. Simonsen taught me how to use the probes and software. Ms. Guerrero, my science teacher, taught me how to conduct a controlled experiment and helped edit my report.