CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)
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Project Number
J1202

Project Title
The Function of Diffusion

Abstract

Objectives/Goals
The goal of my project was to design a computer program that could determine the rate of diffusion between solids using the Scheme programming language.

Methods/Materials
First I learned how to program using "How to Design Programs" and Dr. Scheme. Next I designed a program that computes first-order differential equations, and then I designed a program that computes second-order differential equations. Finally I started working on the diffusion equation.

Results
The two programs that were designed both returned their expected results. The constants in the second-order differential equation caused the results to change.

Conclusions/Discussion
The fact that different results were obtained from the second-order differential equation depending on the constants means that a different diffusion constant would change the rate of diffusion, and this should be researched further. Also, the Improved Euler method will be researched further, as it is a more accurate way of solving differential equations. Because the diffusion equation is just a complicated second-order equation, and I successfully wrote a program that solves a second-order differential equation, it can be assumed that the diffusion equation can be programmed.

Summary Statement
My project is about programming the Diffusion Equation.

Help Received
Mr. Dan Anderson, my computer teacher, taught me programming skills and beginning calculus.