



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Cory C. O'Brien	Project Number J1215
Project Title Evolution of Data: The Effect of Mutation Functions on the Growth of a Computer Generated Population	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals To find an effective mutation function for use in genetic algorithms.</p> <p>Methods/Materials I created a program based on a genetic algorithm. The program randomly generated a population of 265 8-bit organisms, each with four traits. 256 was the number of possible variations of the genetic code. Then the program used the values of the traits of each organism to determine whether it would live to reproduce. The goal was to reach a population of 2560. The variable was mutation. There were two groups with different mutations that had a 10% chance to occur, and a control group with no mutation.</p> <p>Results The mutation that swapped two random bits of a beings genome caused the population to grow fastest.</p> <p>Conclusions/Discussion This program was re-structured based on a previous experiment with 100% mutation rates. The 100% mutation rate turned out to be counter-productive and so I implemented a 10% mutation rate. The slight change caused by the 10% mutation rate caused the population to progress towards better genes more quickly, and allowed strong genes to develop. What I learned in the 100% mutation experiment was extremely important in this experiment.</p>	
Summary Statement My project is about testing different mutation functions in a program based heavily on genetic algorithms	
Help Received My cousin Sheldon taught me to program in Visual Basic.	