



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Brandon R. Sepulveda	Project Number J1609
Project Title Cracking the Code: Analyzing Alphanumeric Combinations and Password Security	
Abstract Objectives/Goals The objective of my science fair experiment is to determine the effects of variable alpha numeric combinations on password security. Methods/Materials In my experiment I am using four letters and or four numbers as the foundation of my investigation. I am using a password hacker called Free Word Excel Password Wizard which recovers encrypted word documents. I used Brute force recovery to crack a word document that I encrypted with one of the variable passwords. I used several different combinations of randomly generated passwords for each alpha-numeric code such as the combination of three letters and one number, two letters and two numbers, three numbers and one letter, four letters and four numbers. Results The results of my experiment show that the password with three letters and one number was the most secure and took on average 57.18 seconds to crack. The password of two letters and two numbers too an average time of 50.83 seconds to crack. The password of one letter and three numbers took 53.74 seconds to crack. The password of four letters took an average time of 52.04 seconds to crack. By far the least secure and fastest to crack was the password of four numbers on average was cracked at a time of 18.02 seconds. Conclusions/Discussion I found that my hypothesis was incorrect. I hypothesized the password with the most letters would be the hardest to crack based on the fact that there 456,976 possible combinations as compared to the 175,760 possibilities of a three letter one number password. In conclusion, people with passwords of more letters and a few numbers have the safer more secure passwords. In this dangerous cyber world where everything is computerized people need to be more informed on how to keep their private information private.	
Summary Statement Determining what combination of alpha numerics creates the strongest password.	
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