CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
J1305

Project Title
IPod Shuffle: How Random Is It?

Abstract

Objectives/Goals
To determine whether the shuffle feature in the iPod really plays songs randomly. I believe that it does not play songs truly randomly because it uses a pseudo-random number generator.

Methods/Materials
My iPod, a die, playing cards, and Microsoft Excel. I conducted three tests and one data analysis to test the uniformity and unpredictability of the iPod shuffle. Uniformity and Unpredictability are the two tests that a random number generator has to pass to be considered random. On my iPod I recorded my voice saying "1-2-3-4-5-6". I then compared the iPod shuffle to rolling a die and dealing playing cards, which represent true random events. I also went to www.random.org and got random numbers which are generated by atmospheric noise and compared those numbers to those generated by the iPod shuffle.

Results
From the testing, the iPod shuffle was as random as the true random events it was compared against; it was just as unpredictable and just as uniform as the true random events.

Conclusions/Discussion
Based on my testing, my hypothesis was proven incorrect; the iPod shuffle is random. I have learned a lot from this project about randomness and random number generators and how they are used.

Summary Statement
My project is about the shuffle feature of the iPod, and if the random number generator it uses plays songs in a truly random order.

Help Received
My dad took me to his work to interview experts in random number generation. One of the experts helped make graphs on the computer. My mom helped me with the display board.