Name(s)	Project Number
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Project Title
Can People Choose Truly Random Numbers?

Abstract

Objectives/Goals
The researcher attempted to determine if people could choose truly random numbers.

Methods/Materials
Via e-mail, the young investigator contacted people throughout the world and asked them to choose random numbers in certain intervals. She used a TI-83 graphing calculator to generate truly random numbers for comparison. She then used the calculator to determine if any statistically significant patterns occurred and to ascertain the probability of obtaining specified chi-square values with given degrees of freedom.

Results
The researcher found that there was less than a one in ten million chance that the distributions of numbers humans picked for 1 to 5, 1 to 10, and 1 to 20 were randomly selected. She found similar, though not quite as dramatic, results for some first digits and last digits. She also found that people chose unusually high or low amounts of squares and primes.

Conclusions/Discussion
To determine the probability of obtaining results as extreme or more extreme than hers, the scientist used the chi-square statistical analysis. She concluded that, even when instructed to do so, people were unable to choose truly random numbers. Possible applications of this project include cryptology, where humanly generated codes could be analyzed to find trends that could be applied to previously unsolved codes, the lottery, where people could choose numbers that do not seem random in order to try to be the only one choosing those numbers, and choosing Personal Identification Numbers that do not seem random, and therefore, would be harder to guess.

Summary Statement
This project is a complex mathematical study of whether humans can generate truly random numbers.

Help Received
Father supported decision to use chi-square analysis.