



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

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Project Title Looking Out for Number One: Do Random Number Generators Follow Benford's Law?	
Abstract Objectives/Goals The purpose of this experiment was to test the randomness of multi-linear congruential random number generators, using Benford's Law as a reference. Benford's Law proves that in any set of truly random data, the first digit will be one most prominently, and the likelihood of other digits occurring decreases in chronological order. Methods/Materials The only material used was the random number generator inside a TI-83 PLUS graphing calculator. Results The random number generator did not generate truly random numbers. In Benford's Law, the range is 35.3%, but for the generator's data, it only was 5.8%. Also, in Benford's Law, the likelihood of a certain first digit occurring decreases chronologically. However, in these findings, there was no logical order in the likelihood of the digits. Conclusions/Discussion This experiment proved that numbers from a multi-congruential linear random number generator do not follow Benford's Law. Either Benford's Law does not truly define random data, or the generator itself somehow guarantees for each first digit to be distributed the same amount of times.	
Summary Statement This experiment seeks to see if the numbers generated by a multi-congruential linear random number generator follow Benford's Law.	
Help Received	