



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

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Project Title Benford's Law	
Abstract	
Objectives/Goals To test the validity of Benford's Law and how it can be applied in real life situations.	
Methods/Materials	
Materials List	
<ol style="list-style-type: none">1. Microsoft Excel2. Various statistics from The World Almanac3. Vital Statistics of the United States Volume II-Mortality4. Random Number Table5. Various articles on the internet	
Procedures	
<ol style="list-style-type: none">1. Collect various data from World Almanac2. Put this data into an Excel spreadsheet.3. Using various formulas, isolate the left most digit.4. Then count the number of times, each digit appears.5. Graph the data.6. See if the data follows the Benford's Law distribution.7. Test whether or not truly random numbers from a random number table and data, which is bounded fit the distribution. Repeat procedures 2-6.8. Test whether or not things such as land area still fit the distribution even after being converted to another unit. Repeat procedures 2-6.	
Results	
Benford's Law does in fact apply. However, certain sets of data does not conform to Benford's Law namely, data which is bounded by a maximum and minimum, numbers randomly generated by a person, assigned numbers, and numbers taken from a random number table.	
Conclusions/Discussion	
The data collected from this experiment supports the hypothesis given to a certain extent. Various data such as World Wheat Production and US Air Quality of certain cities all shows a conformation to Benford's Law. However, data such as SAT scores and human generated numbers showed that it does not conform to data which is bounded or generated in such a manner.	
Summary Statement	
This project is a validation of a peculiar mathematical phenomenon known as Benford's Law and a look into its applications in real life.	
Help Received	
Mother and Father helped with cutting and pasting of board. Dr. Gross helped with some background information and ideas.	