



What Is Statistics?

- American Heritage® Dictionary: “The mathematics of the collection, organization, and interpretation of numerical data, especially the analysis of population characteristics by inference from sampling.”
- Statisticians collect and analyze data, then calculate results using a specific design. They draw conclusions and make decisions in the face of uncertainty.



Why Study Statistics?

- Collecting data on subsets of the population (samples) can give valid information about the whole population.
- Knowing what has happened in the past can help answer questions about the present and future.
- Knowledge helps plan future tests, determines resource allocation, and improves quality.

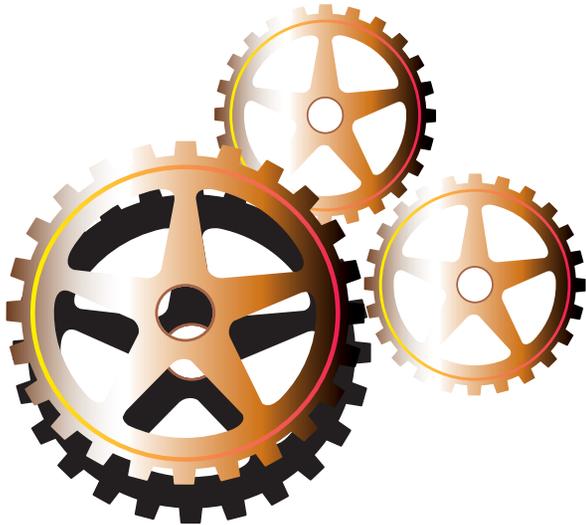
What Do Statisticians Do?

- Study the safety of **nuclear power** plants
- Evaluate the environmental impact of **pollution**
- Determine the effectiveness of new **drugs**
- Estimate the U.S. **unemployment** rate
- Analyze **consumer demand** for products
- Plan and analyze **agricultural** experiments

What Can I Do
With A Degree in
Statistics?

Business and Industry

- **Manufacturing**
 - Build products and deliver services that satisfy consumers and increase the corporation's profit margin



Business and Industry

- **Marketing**

- Design experiments for new products, conduct focus groups and sample surveys, and perform field experiments in test markets to determine product viability



Business and Industry

- **Engineering**

- Make a consistent product, detect problems, minimize waste, and predict product life in electronics, chemicals, aerospace, pollution control, construction, and other industries



Business and Industry

- **Statistical Computing**

- Work in software design and development, testing, quality assurance, technical support, education, marketing, and sales to develop code that is both user-friendly and sufficiently complex



“

I love that statistics is very multi-disciplinary. It involves problem solving in a group environment and it involves many skills and talents. I love the ability to be a mathematician, computer scientist, teacher, quizmaster, sleuth, and devil's advocate all rolled into one.

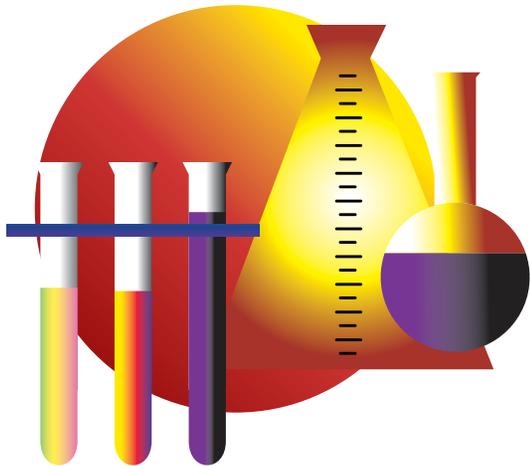
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Linda Quinn, Private Industrial Consultant

Health and Medicine

- **Epidemiology**

- Work on calculating cancer incidence rates, monitor disease outbreaks, and monitor changes in health-related behaviors such as smoking and physical activity



Health and Medicine



- **Public Health**

- Prevent disease, prolong life, and promote health through organized community efforts, including sanitation, hygiene education, diagnoses, and preventative treatment

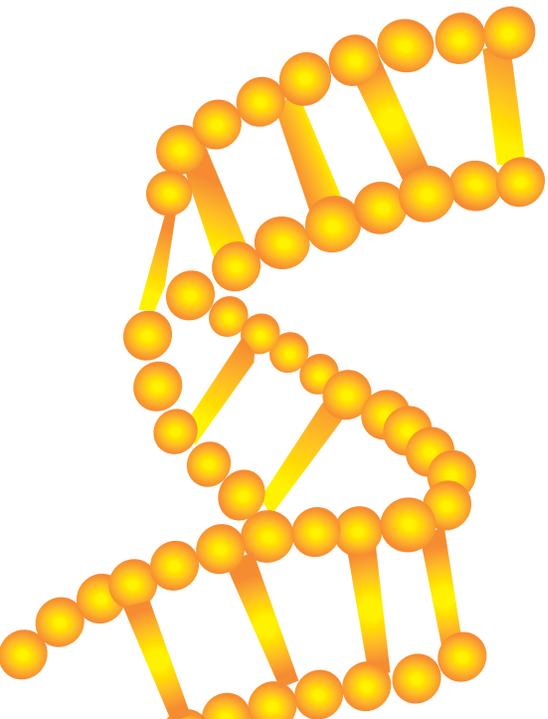
Health and Medicine

- **Pharmacology**

- Work in drug discovery, development, approval, and marketing, to ensure the validity and accuracy of findings at all stages of the process



Health and Medicine



- **Genetics**

- Label possible indicators of genetic abnormalities, such as birth defects and early aging, or breed desirable characteristics in plant offspring

“ Last year when I began applying to medical schools, the fact that I majored in statistics was always a good conversation point in interviews and made me more unique as an applicant. ”

Amy Elise Derrow, Medical Student

Learning

- **Education**

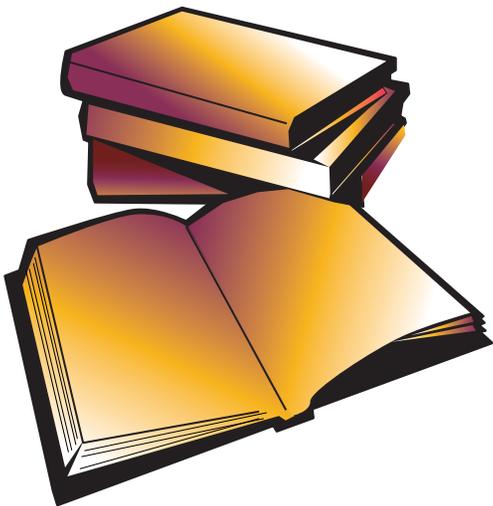
- Teach K-12 through post-graduate students, assess teacher effectiveness, or develop statistical models to represent student learning



Learning

- **Science Writing & Journalism**

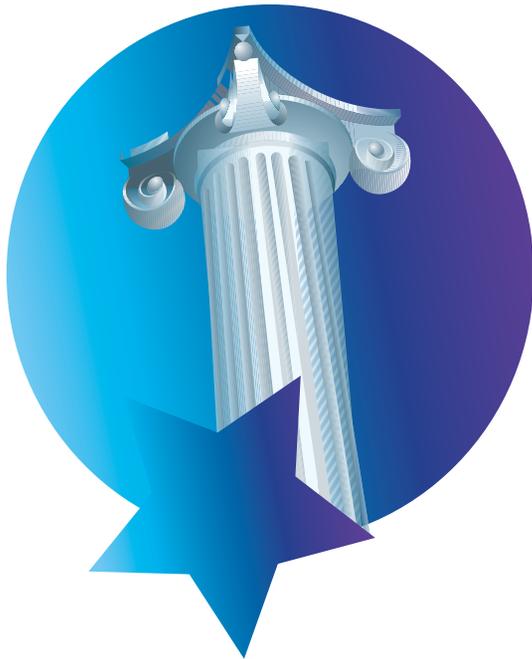
- Work with mass media, universities, and corporations to produce news briefs, articles, news releases, and other reports



Research

- **Government**

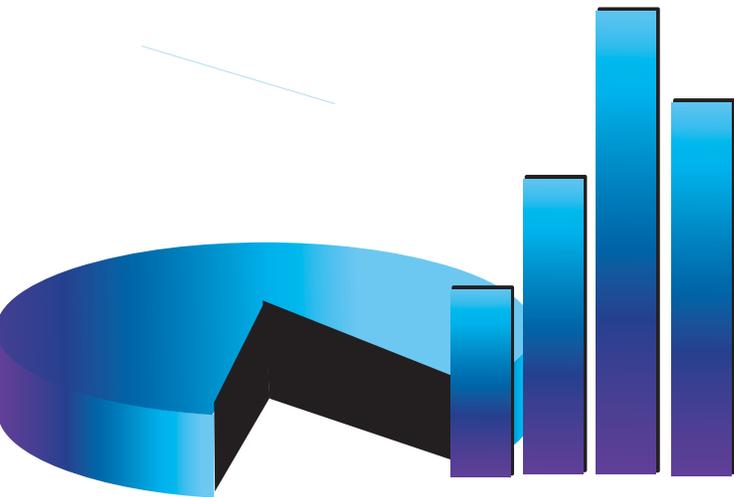
- Work in regulations for stock trading, pollution, and drug approvals, or testify in court proceedings, congressional hearings, and lobbying arguments



Research

- **Survey Methods**

- Collect data in the social sciences, education, law, forestry, agriculture, biology, medicine, business, and e-commerce, and for the government



“ I found that statistics used more reasoning and logic skills than the mathematics courses I had previously taken. The more I did statistics, the more I liked the “alternative” application of mathematics that it provided. I especially liked being able to use a lot of data and a little common sense to figure out problems. ”

Tiffany T. Sundelin, Quality Control Engineer

Social Statistics

- **Law**

- Analyze data in court cases, including DNA evidence, salary discrepancies, discrimination law suits, and disease clusters



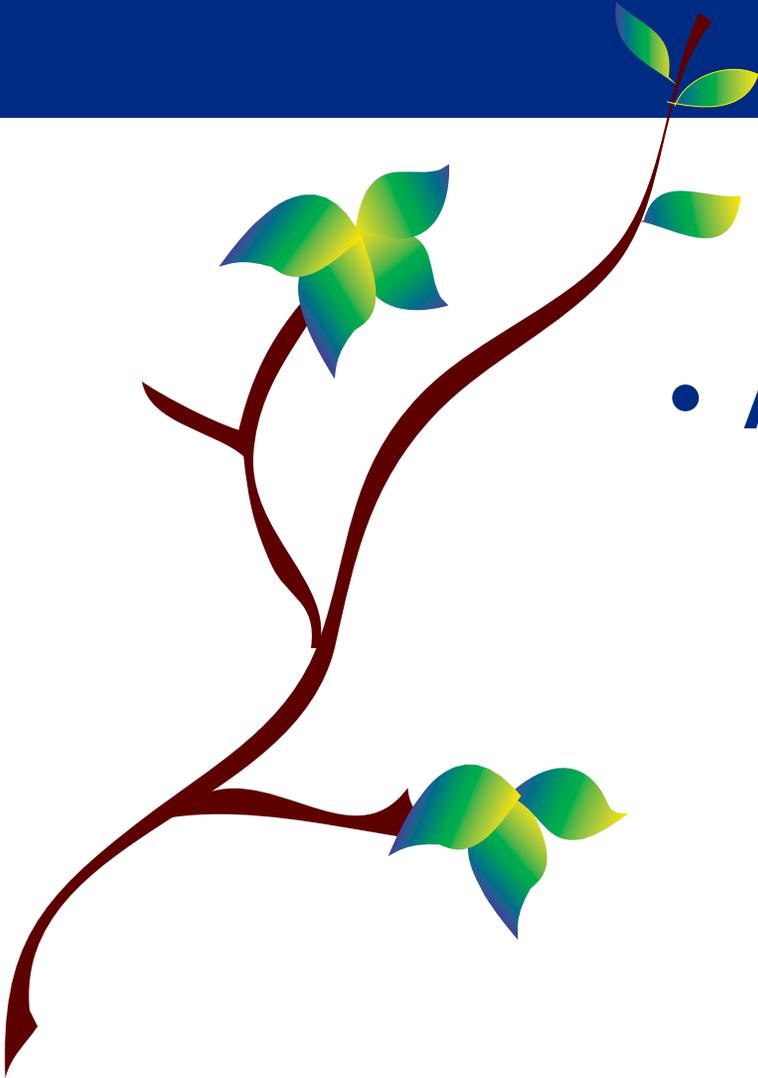
Social Statistics

- **Consulting**

- Work on a temporary basis on a variety of projects including quality improvement, pharmaceuticals, ecology, and engineering



Natural Resources



- **Agriculture**
 - Study chemical pesticides, hydrogeology, veterinary sciences, genetics, and crop management in order to ensure optimal yield

Natural Resources



- **Ecology**
 - Address questions about the earth's natural environment, including animal populations, agricultural protections, and fertilizer and pesticide safety

“ I became involved with statistics because mathematics did not provide the avenue to cross into other areas of science and continue to learn about topics that interested me. I have stayed in statistics because of the diversity that it offers and because of the rational approach it provides to seek solutions to problems. ”

Dan Mowrey, Senior Research Scientist

How Do I Become
A Statistician?

Education

- **High School**
 - Study statistics, mathematics, science, computer science, and English
- **College**
 - Major in statistics, applied mathematics, or a closely related field (i.e. epidemiology, engineering)
- **Post-Graduate**
 - Many career fields require a Master's degree or PhD in a specialized statistical field

Skills

- **Quantitative Skills**
 - Statistics, Mathematics, Science
- **Problem Solving Skills**
 - Analysis, Teamwork
- **Communication Skills**
 - Verbal, Written
- **Computer Programming Languages**
- **Foundation in Field of Application**

Opportunities

- **Diversity**
 - Pure Research
 - Interdisciplinary Teams
- **Advancement**
 - Experience, education, and communication skills lead to professional advancement
- **Versatility**
 - Challenging and Exciting Fields of Application

And Always Remember

**THERE IS
STRENGTH IN
NUMBERS**