

STAT 216 - Introduction to Statistics

What is statistics? **Statistics** is the science of collecting, analyzing, summarizing, and presenting data (the text defines it as “a way of reasoning, along with a collection of tools and methods, designed to help us understand the world.”)

Why is statistics important?

- Statistics helps us become better decision makers and problem solvers.
- Statistical methods allow us to enhance our knowledge of ourselves and the environment we live in.
- You will have the ability to understand and critique research results in your area of interest.

Statistics is all about understanding variability. If the world was perfectly predictable with no variability, we would have no reason to study statistics!

What are data? **Data** *are* numbers or characteristics with some specific meaning. (*Data* is the plural of *datum*.)

Example: The numbers 5, 9, 15, 27, 33, 21 do not constitute data in and of themselves. These numbers are only data if they have some context.

- These could represent waiting times for six patients at a health clinic.
- They could be the ages of those six patients visiting the health clinic.
- It is important to clearly state what your data represent, not just give the values.

Where is statistics used?

Everywhere!!!

Biology	Comparing closing strengths of three crab species
Forestry	Estimating average trunk diameter of lodgepole pines
Ecology	Testing whether burn severity affects a particular animal
Education	Comparing student learning in large vs. small classes
Business	Modeling sales of a product over a period of time
Medical	Assessing potential treatments for Parkinson's disease.
English	Deciding authorship of disputed documents
⋮	⋮

Where are we headed?

1. Data Analysis
2. Data Production
3. Statistical Inference