# Lesson 1 - Preliminaries

Objectives:
1. Six Steps of Statistical investigation
2. Four pillars of statistical inference
3. Basic terminology: observational units, quantative and categorical variables, distributions

## Six Steps of statistical investigation

1. Ask a research question (Research hypothesis)
2. Design a study and collect data
3. Explore the data
4. Draw inferences (Logic of inference) (Significance estimation)
5. Formulate conclusions (Scope of inference) (Generalization Causation)
6. Look back and ahead

## Four Pillars of Statistical Inference

Logic the Math
1. Significance - How strong is the evidence of an effect? STRENGTH
2. Estimation - What is the size of the effect? SIZE

Scope the so what
3. Generalization - How broadly do the conclusions apply? BREADTH
4. Causation - Can we say what caused the observed difference? CAUSE

## Basic Terminology

Observational Units - These individual entities on which data are recorded

Categorical Variable - Take category designations (eye color, marital status)
- variables w/ non-numeric values

Quantitative - variables w/ numeric values with which arithmetic can be done (height, # siblings, age)

Distribution - The pattern of outcomes of a variable

Boardwork
P.1.1.1 - P.1.1.2 Exercise
P.1.3 - P.1.4 notetaking
P.1.1.9 Skydiving - 6x Step Process

Flow

- Introductions (name game)
- Course Overview
  - Graded events
  - Wiley Plus (HW and course guide)
  - Textbook
  - CJS e-acknowledgements
  - R
  - Teams Page
- Academic Integrity Brief
- Why Statistics? → Spurious correlations
- Day Ø assignment
- Initial Course survey
- Basic R Overview
- Lesson
  - 6x step process
  - Categorical, quantitative, obs units
  - 4x pillars