

## **Sciences can be distinguished by (a partial list):**

- **Subject/Object:**
  - Natural sciences
    - Physical
      - Physics
        - Astronomy
        - Cosmology
        - Solid State
        - Fluid Dynamics
        - Atomic/Nuclear
      - Chemistry
        - Organic
        - Non-organic
      - Geology
      - Oceanography
      - Meteorology
    - Life
      - Biology
        - Flora
        - Fauna
        - Micro
      - Ecology
    - Hybrid
      - BioChemistry
      - BioEngineering
      - Chemical Physics

- **Social sciences**
    - Economics
      - Macro
      - Micro
    - History
  
  - **Behavioral sciences**
    - Psychology
    - Psychiatry
  
  - **Mathematical sciences, Data Science**
- **Method**
    - Observation
      - In Situ
      - Abstractio
      - Separatio
    - Theoretical Exploration
      - Mental models
      - Mathematical models
    - Collecting data, Reducing/Analyzing data
    - Experimentation
      - *Non-destructive*—some experiments fall into this category in the macro sense. Many experiments had to start out as destructive before they were improved enough to become non-destructive testing

➤ *e.g.*, ultrasound, CAT Scans, MRI scans

- *Destructive*—the problem with destructive experiments is that once you ruin the subject of the experiment then you ruin the opportunity for reproducibility and further research using the exact same materials
  - *e.g.* carbon dating

Perturbation—making a small change to discover the effect of that small change.

Systematic variation—conducting an experiment in such a way that things are done consistently and in equal amounts in order to discover how much should be added/subtracted/changed or how long the process needs to run/for how many iterations. Systematic is not synonymous with LINEAR VARIATION.

- Mathematical/Data modeling
  - Interpolation—I measure it here, and I measure it there, and I try to figure out what happened in between
  - Extrapolation—I measure it here and here and try to predict what will happen beyond the range of my measurements