

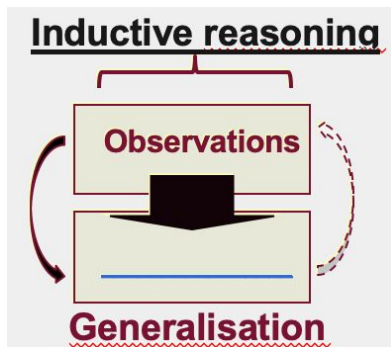
# Chapter 1 - The Scientific Method

## The scientific method

- Inductive reasoning
- deductive reasoning
- scientific process
  - description-based
  - Hypothesis based

### Inductive reasoning

- Linked to descriptive-based approach
- Making a generalization often based on numerous observations
- Particular-> general (generalization)



### Deductive reasoning

- Linked to hypothesis based approach
- Evidence based; starts with inductive reasoning
- Involves stating a hypothesis and drawing conclusions after experimentation or observation from this hypothesis
- Particular

### The scientific process

1. Inductive reasoning / Observation
  - make a generalization about something after one or multiple observations
2. Generate a hypothesis to explain the observation
  - scientific hypotheses must be verifiable, refutable, and reproducible.
3. Make a prediction
  - must be testable and give a clear result.
  - Use "If ... Then..." statement
  - Can be falsified or not falsified
  - Is NOT the scientific truth
4. Testing.

- If a hypothesis survived multiple attempts of falsification = theory

**The clauses of the contract between science and knowledge:**

1. Initial skepticism of facts
  - Ask honest questions on facts and hypothesis. Re-test what has been found.
2. Realism
  - The realm of ideas does not have priority over the real world.
  - Put away all ideologies.
  - Be entirely objective. Face data to face-value.
3. Rationality
  - Logic: demonstrations using coherent steps
  - Parsimony: methodological principle which states that acceptable theories are hypothetically the most economical in assumptions.
4. Methodological materialism
  - All that is experimentally accessible in the real world is material or has material origin.
  - Evidence-based

Breaking one of the clauses invalidates the contract because the acquisition of knowledge is not associated with an objective search for the scientific truth.

**The Scientific Process: Summary**

