

Case of the Missing Computer Chip

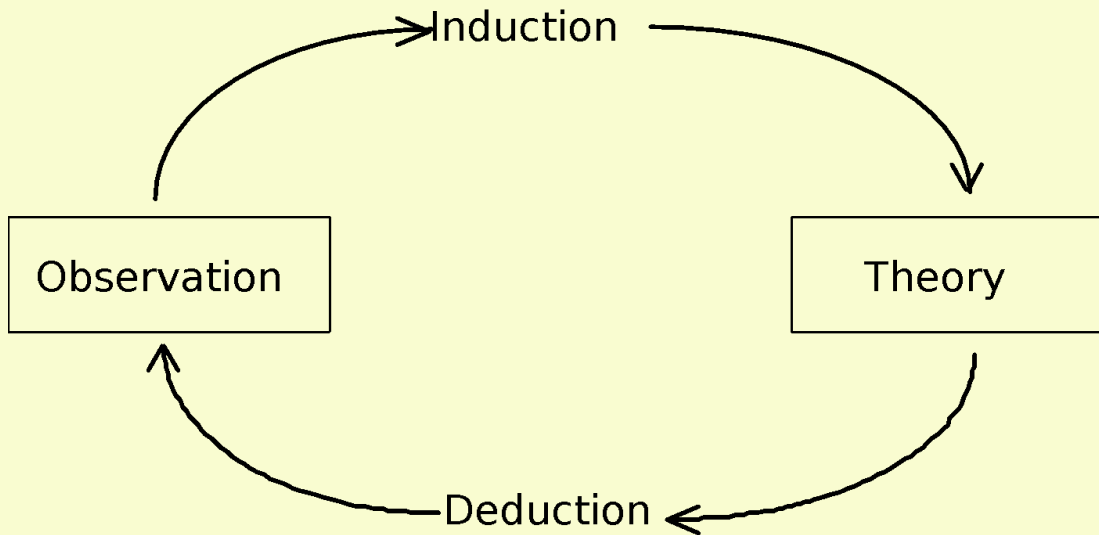
1. Why was the first hypothesis difficult to make?
2. How did the EVIDENCE clues help?
3. How did the MOTIVE clues help?
4. If you changed your original hypothesis why? If you didn't change your original hypothesis why?
5. Was all of your evidence useful? Explain.
6. Was it easy or difficult for your group to come to consensus? Explain.
7. Was it easier or more difficult to reach consensus as a class? Explain

Scientific Reasoning

Forensic Science

The Cycle of Science

- Scientific reasoning must use both **inductive** and **deductive** reasoning



The Cycle of Science (continued)

- **Inductive reasoning** – moving from specific observations to broader generalizations and theories
 - Begin with specific observations and measurements; then detect patterns and regularities
 - Formulate some tentative hypothesis that we can explore
 - Finally develop some general conclusions or theories

The Cycle of Science (continued)

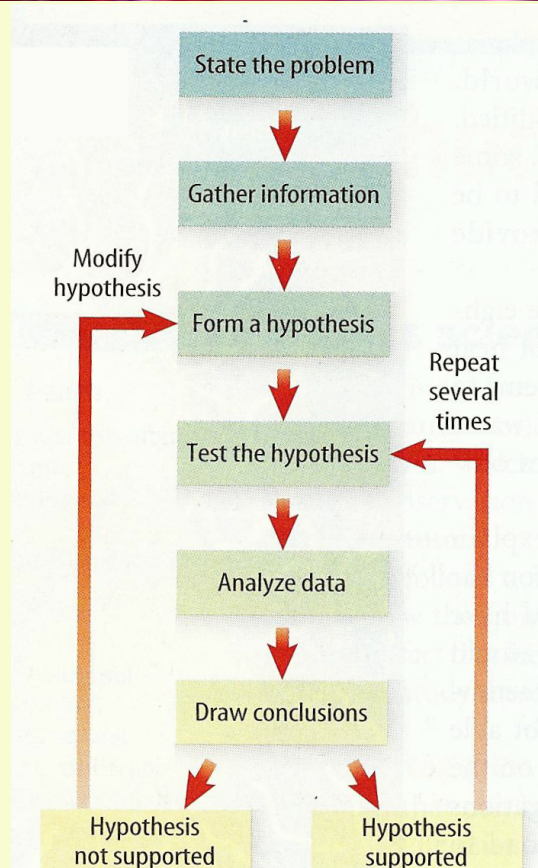
- **Deductive reasoning** – works from general to specific
 - Begin with creating a theory about a topic of interest
 - Narrow that down into a more specific hypothesis that we can test
 - Narrow that down even further when we collect observations to address the hypothesis
 - Test the hypothesis with specific data

How Scientists Reason

- Scientists use the **scientific method** to generate **hypotheses**, create experiments to test them, comprehend patterns of data, and form **theories**.



Scientific Method



Observation

- **Observations** are recorded facts about what you see (*vs. inference*)
- There are two types of observations
 - **Quantitative** – results in a numerical form, with a unit
 - **Qualitative** – results in a descriptive form



Experimental Control

- Scientists work to create experimental control
- It is important for comparison, so scientists know what has the effect in the experiment
- The **control** is the normal condition(s) for the subject being tested



Variable

- The **variable** is the thing that is being changed in the experiment
- You should only have one variable



Conclusions

- Scientists make **conclusions** based on the data collected and the observations made
- Sometimes they support the hypothesis and sometimes they do not
 - **Modify the hypothesis!**

