

Science: a methodical approach to the acquisition of knowledge



universal simple

Observation: Use the metric (SI) units to measure your world!

Question: Be curious-the bad question is the one you fail to ask!

Hypothesis: Make falsifiable educated guess to answer question

Prediction: **If** the hypothesis is true...

then the dependent variable will respond...

when I manipulate the independent variable.

Experiment: Manipulate the independent variable=**treatment**

Measure the dependent variable

Compare the response to an **unmanipulated control**

Analysis: Use statistical test and allow % for statistical error

Type 1: rejecting a true H -- Type 2: failing to reject false H

Decision: Reject hypothesis **or** Cannot reject hypothesis

An example of the Scientific Method

It is night...very dark...new moon or clouded over...

You arrive home, unlock the door, reach in...

You flip the light switch...

But there is no light!

Your brain is a scientist and will test a range of hypotheses over a few moments of time and solve the problem. It knows the steps of the scientific method and the concepts of replication, treatment and control, and statistical analysis. It works very rapidly and opportunistically to arrive at an explanation.