

Introduction and the Scientific Method

- All living things share similar characteristics
 - Organized in a specific way
 - Need and acquire energy
 - Maintain an internal constancy (homeostasis)
 - Reproduce, grow, and develop
 - Evolve
- The Scientific Method
 - Scientific knowledge is the information about the natural world
 - The scientific method is the process of collecting or acquiring scientific knowledge
 - Composed of multiple parts
 - Observation
 - Hypothesis --> a tentative explanation for an observation; is either supported or not supported by evidence found through the experiment
 - Prediction --> a statement made to test your hypothesis, often in an "if...then" statement
 - Experiment --> by which both the prediction and hypothesis are tested
 - Must be conducted under controlled conditions
 - Has variables
 - The independent variable is what you control
 - The dependent variable is what you measure
 - The control variable is what stays the same, and is often used as a standard for comparison
 - Usually have two different groups receiving different treatments
 - The experimental group receives the treatment
 - The control group does not receive the treatment
 - A double blind study is when neither the researchers nor the subjects know which group is getting the treatment and which is getting the placebo --> helps prevent bias during interpretation of results
 - Conclusion --> was the hypothesis supported?
- A theory is a broad explanation for a phenomenon that has been tested repeatedly and has found to be reliable accurate (evolution, gravity, germ theory, string theory)
- Results are made known in scientific journals for peer review and popular press for the general public