**What is Science?**

* Science is a method for **studying** the natural world
* It is a **process** that uses **observation** and **investigation** to gain knowledge about events in nature.

**Scientific Method**

The **Scientific Method** is a **process** that scientists follow in order to answer **Questions** about the world around us.

1. It ensures your experiment will actually answer your question.
2. It shows the world how you obtained your results.
3. It allows other scientists to recreate your experiment to support/disprove your conclusions.
4. It allows other scientists to build and extend on your research
5. Start with a **Question**
   * What do you want to know or explain?
   * A good Question should be **specific**, **testable**, and should have **one answer**
6. Formulate a **Hypothesis**
   * What do you think will happen?
   * Predict the answer to your question or the outcome of the experiment.
   * Usually written as an “If…..(Independent variable )…then …(dependent variable)…. because......” statement.
7. **Identify the Variables....see below**
8. **Materials**
   * What items to you need to carry out your experiment?
9. **Method/Procedure** 
   * How will you test your hypothesis?
   * Develop a procedure for a reliable experiment and address safety rules.
10. **Observations**
    * Record data and observations in a data table and (graph if necessary)
    * Qualitative Observations – descriptors (appearance, taste, feel…)
    * Quantitative observations – have a numerical value (mass, height, temperature)
11. **Analysis**
    * Are the data reliable?
    * Does your data and observation from the experiment support your hypothesis?
12. Write a **Conclusion** 
    * Summarizes the important parts of your experiment and the results.
    * Refer back to your hypothesis. Did you prove or disprove your hypothesis?
    * Discuss sources of error
    * What improvements are needed?

**Scientific Method uses Fair Testing: What is a Fair Test?**

An investigation where **only one factor** is changed while all others are kept the same (controlled).

* + This way, the changes are due only to the thing we want to test.
  + Eg if testing the effect of amount of light on the growth of seedling, keep everything else the same.
  + type of soil, amount of water, temperature, length of time grown, etc

**Independent Variable:** the variable that is manipulated by the investigator, (what you change to see the effect (s) on other variables

Example: Amount of light plant receives

**Dependent Variable:** the variable that changes as a result of the independent variable. It is usually the factor being **measured** by the investigator.

Example: plant height

**Controls:** These are the variable that are kept constant in all treatments so that any results can be connected solely to the effects of the independent variable.

Example: type and amount of soil, amount of water, type of plant, etc

