**3. The Scientific Method**

* is a systematic and logical approach to discovering how things in the universe work
* The scientific method is the process followed to investigate [**phenomena**](https://en.wikipedia.org/wiki/Phenomenon) and acquire new [**knowledge**](https://en.wikipedia.org/wiki/Knowledge)
* This new knowledge is then used to correct or integrate with previous knowledge allowing for further investigations

 = **an ongoing process**



1. Define the **Problem (Purpose)** This could be stated in the form

 of a question.

2. Do **Background Research** to find out what is already known

 about the topic.

3. State a **Hypothesis**, an **“educated guess”** as to the answer

 to the problem based on reasoning (could be “If ...Then...”)

4. Design & carry out a **Controlled Experiment**

 A. Independent Variable**:** variable you **change on purpose**

 B. Dependent Variable**:** variable that responds to a change in

 the independent variable **(the 1 you are testing for)**

 C. Constants**:** variables kept the **same** in all trials

 D. Control**:** the **standard** for comparison

5. **Data & Observations** are made and recorded as the

 experiment proceeds.

 The 2 types of observations are:

 A. Quantitative: **numerically measurable**

 B. Qualitative: changes in **characteristics** of an object

 This **data** is recorded the in the form of notes, drawings,

 tables, graphs, etc

6. Formulate a **Conclusion** . **Analyze** and **interpret** your data to

 **summarize** your findings which support or disproves the

 suggested hypothesis.

**Monty Python’s Scientific Method**

Problem:

Background Information:

Hypothesis:

Materials:

Experiment Description:

Data Collected

Conclusion

* Modern medicine uses the scientific method to determine how effective any particular medicine is.
* This is done using what’s called a **“Double Blind Study”,** which is a procedure that works something like this:
	+ Get your group of subjects, and divide them into three.
	+ One group gets the drug.
	+ One group gets a **placebo**, which is a sugar pill.
	+ One group gets nothing at all.
	+ Monitor the changes.
* No one except for the researchers know who’s in the first group and who’s in the second, because knowing you’re taking the real thing or the placebo, will change how you act, and bias the results.
* The goal is to **eliminate bias**, so that you get the results of the drug or treatment, rather than their preconceived idea which could influence their behaviour.

**Scientific Method Group Project**

1) Pick a question to answer.

2) Use the steps of the scientific method to devise an experiment that would

 determine an answer for the problem. On loose leaf paper record the

 following:

 a) The problem you are trying to solve

 b) Background information you know / have gathered

 c) Hypothesis

 d) Design an experiment to test your hypothesis. Be sure to:

 i) include a list of materials

 ii) describe the experiment

 iii) list independent variable, dependent variable, constants & control

 iv) describe the type of data you would collect