## 1. What is Science?

- Science is both a body of **knowledge** and a **process**
  = information gained through **observation** and **experimentation**.
- The goals of science are to collect and organize information and to propose explanations that can be tested.

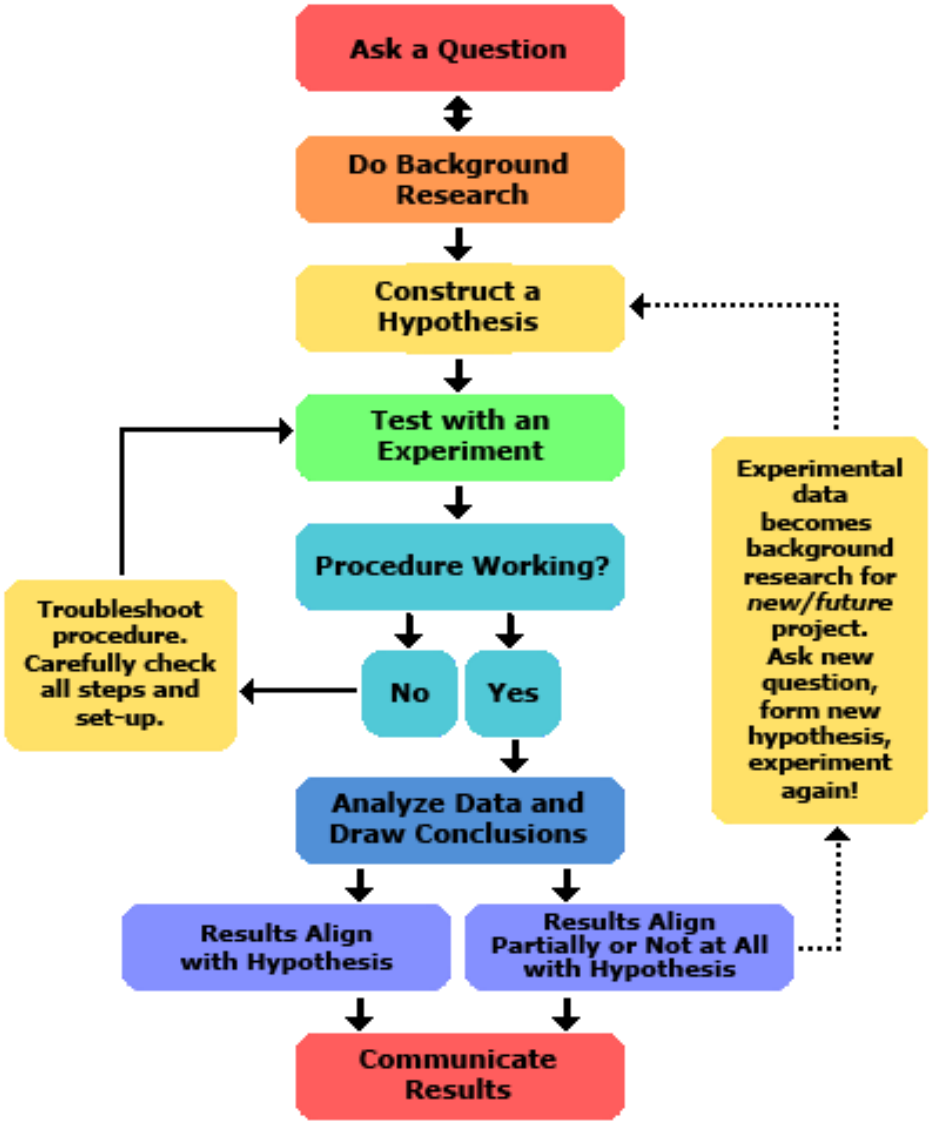
## 2. What is Health Science?

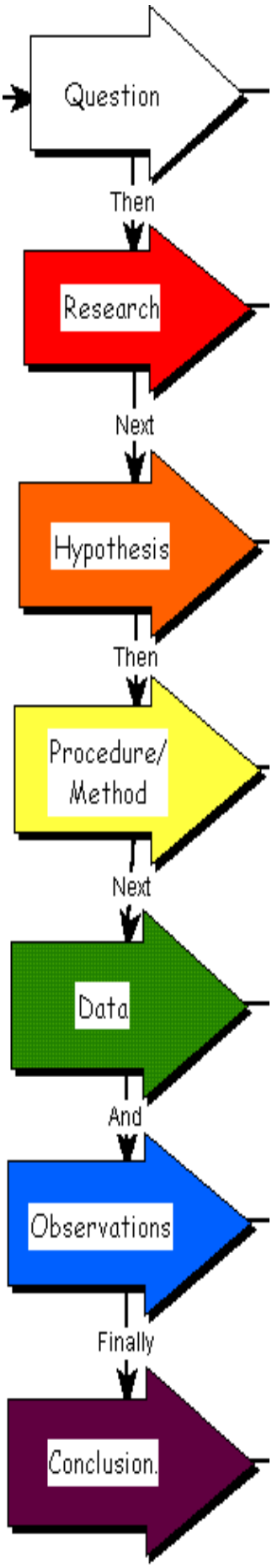
- our current knowledge of health & the application of that knowledge to:
  - **improve health**
  - **prevent and cure diseases**
  - **understand how humans and animals function**.
- Health Science is an **applied science**
  = Health scientists make discoveries about factors which impact health, disease, diagnostics and then use those discoveries to give health professionals the tools required to deliver safe and effective health care
- There are many branches of Health Science including:
  - **anatomy**
  - **physiology**
  - **microbiology**
  - **epidemiology**
  - **immunology**
  - **biotechnology**
  - **etc**.
- All of these branches involve the use of both **Scientific Language** and the **Scientific Method**

## 2. 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** and acquire new **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 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.

**"Big Bang Theory" and the Scientific Method** Big Bang 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.

**Video:** The Power of the Placebo Effect