

# What is Science?

During this assignment you will (hopefully) learn more about what science is and the tools scientists use. Read over this this file. On the last slide is a link to a YouTube video and that video runs about 13 minutes. Watch it and then answer the questions at the end.

# What is Science?

We can find different definitions

## Definition 1:

Science refers to a system of acquiring knowledge. This system uses observation and experimentation to describe and explain natural phenomena.

From: <http://www.sciencemadesimple.com/science-definition.html>

# What is Science?

## A second definition:

Science is the systematic enterprise of gathering knowledge about the universe and organizing and condensing that knowledge into testable laws and theories.

The success and credibility of science are anchored in the willingness of scientists to:

1. Expose their ideas and results to independent testing and replication by others. This requires the open exchange of data, procedures and materials.
2. Abandon or modify previously accepted conclusions when confronted with more complete or reliable experimental or observational evidence.

Adherence to these principles provides a mechanism for self-correction that is the foundation of the credibility of science.

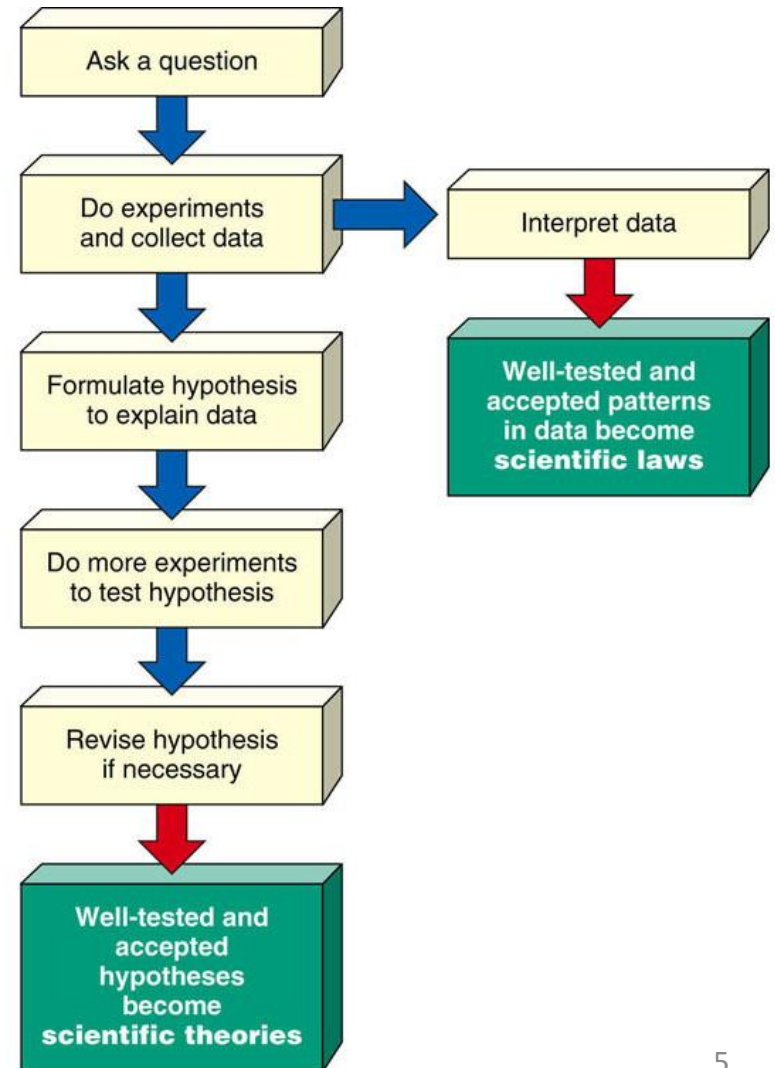
# What is Science?

- A third definition of science:
  - Science is the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence.

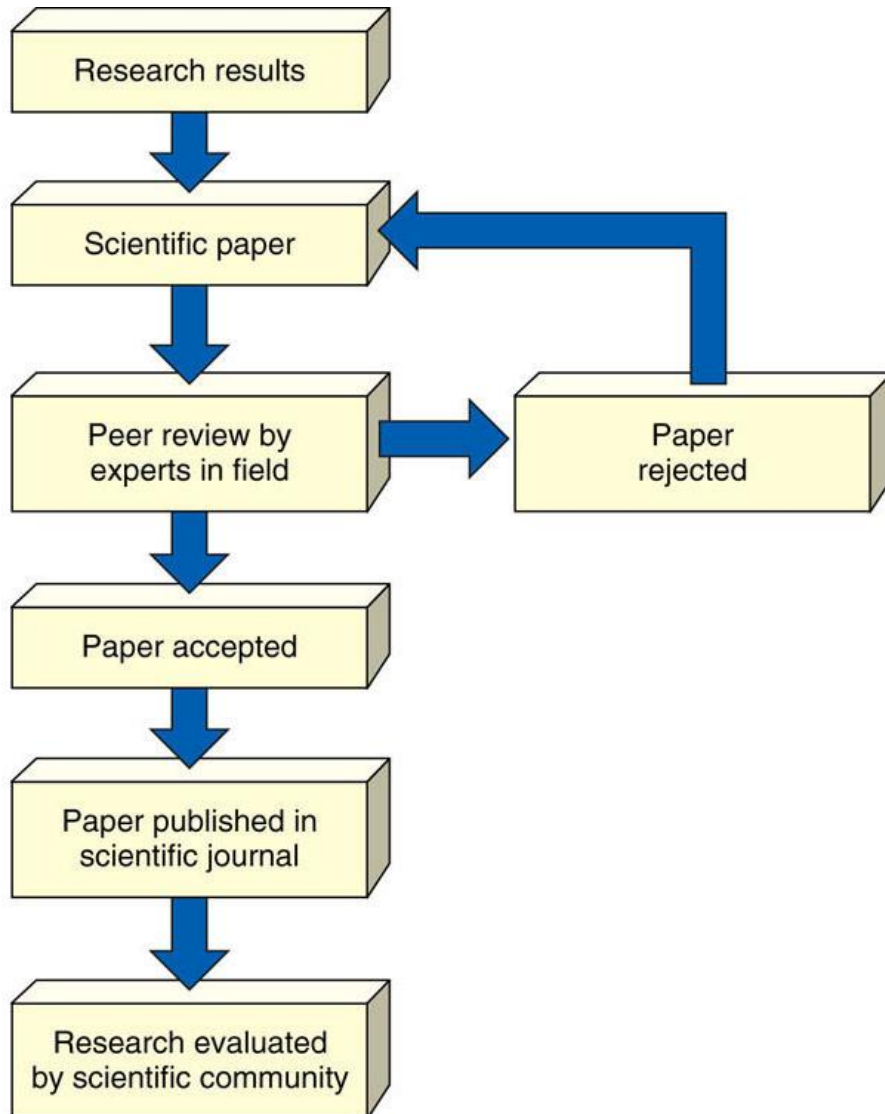
From: <http://sciencecouncil.org/about-us/our-definition-of-science/>

# THE NATURE OF SCIENCE

- What do scientists do?
  - Collect data.
  - Form hypotheses.
  - Develop theories, models and laws about how nature works.



# Scientific Theories and Laws: The Most Important Results of Science

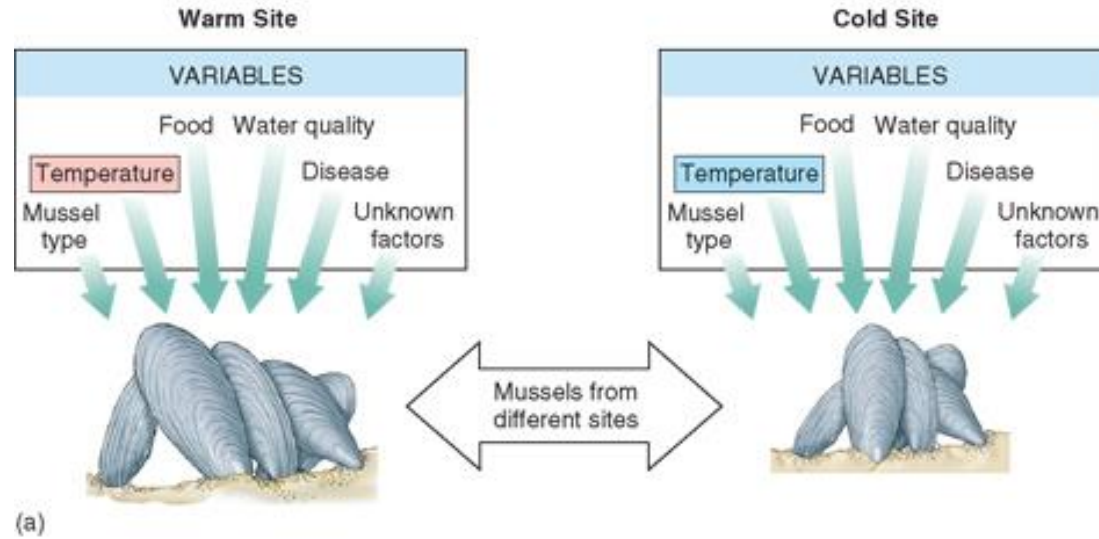


- Scientific Theory
  - Widely tested and accepted hypothesis.
- Scientific Law
  - What we find happening over and over again in nature.

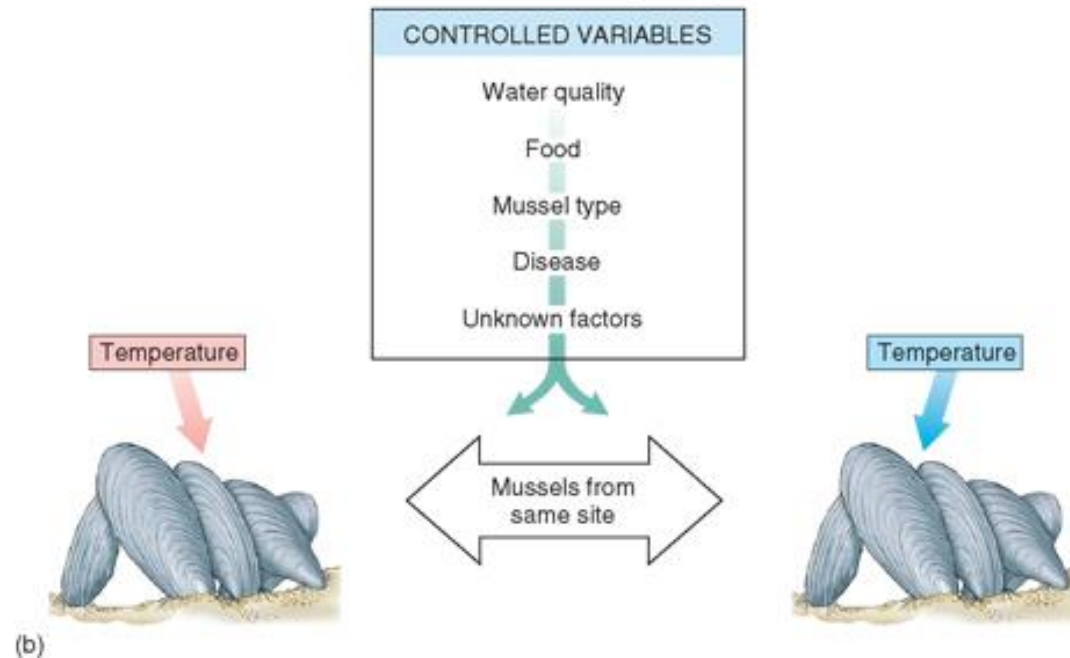
# Testing Hypotheses

- Scientists test hypotheses using controlled experiments and constructing mathematical models.
  - **Variables** or **factors** influence natural processes
  - Single-variable experiments involve a control and an experimental group.
  - Most environmental phenomena are **multivariable** and are hard to control in an experiment.
    - Models are used to analyze interactions of variables.

## Field Observations



## Controlled Laboratory Experiment





# What is Science?

- The set of procedures by which scientists learn about the world is known as the scientific method.
- A scientific hypothesis is a statement about the world that might be true and is testable.
- A testable hypothesis is one that is at least potentially can be proven false.
- No hypothesis can be scientifically proven true. Hypotheses are accepted for as long as they are supported by the evidence.

# What is Science?

Video on what science is:

<https://www.youtube.com/watch?v=YwYEy5AXwIQ>

# Questions

Answer the following questions (use complete sentences; grammar and punctuation matter).

1. What makes it so difficult for Dr. Krampf to define what science is?
2. What is the definition of science given by Dr. Krampf?
3. What are some subjects mentioned in the video that are not a part of science?
4. Why do you think these subjects are not included within the realm science?
5. What do we mean by the term “observation”?
6. How do we make observations?
7. What do we mean by the term “objective”?
8. What is an experiment?
9. What is meant by the term “self-correcting”?