Scientific Inquiry

Standard B – 1.1

Standard B-1

The student will demonstrate an understanding of how scientific inquiry and technological design, including mathematical analysis, can be used appropriately to pose questions, seek answers, and develop solutions.
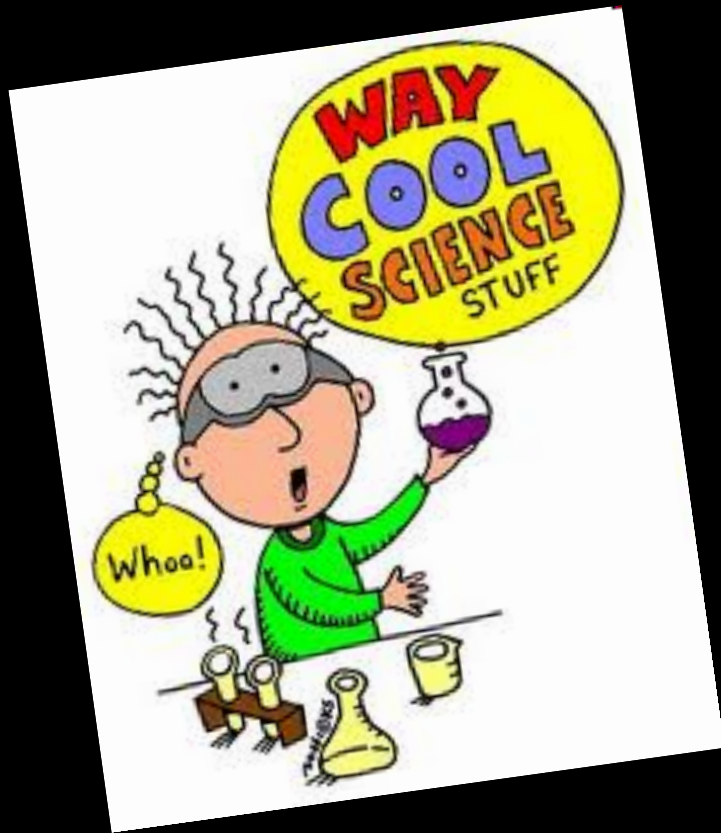

B-1.1
Generate hypotheses on the basis of credible, accurate, and relevant sources of scientific information.

Key Concepts

- Hypotheses

- Sources of Scientific Information

What You Already Know!

You were first introduced to what a hypothesis was in the *5th grade*. In Physical Science, you will be expected to have a more in-depth understanding of the processes and importance of using credible, accurate, and relevant sources of scientific information.

What You Should Understand After This Lesson

- Know that a hypothesis is a reasonable explanation of an observation or experimental result or a possible answer to a scientific question that can be tested.

- Use credible, accurate, and relevant sources of scientific information in preparation for generating hypotheses.

Objective

- ***Identify*** the variables involved in a hypothesis.

- ***Use*** data to determine whether a hypothesis was supported or not supported by that data.

- ***Summarize*** the criteria by which scientific information is used to help generate hypotheses.

Vocabulary

1. Hypothesis
2. Independent variable
3. Dependent variable

Nerd Quirk #105

Being super aggravated when your vocabulary words are not in alphabetical order.
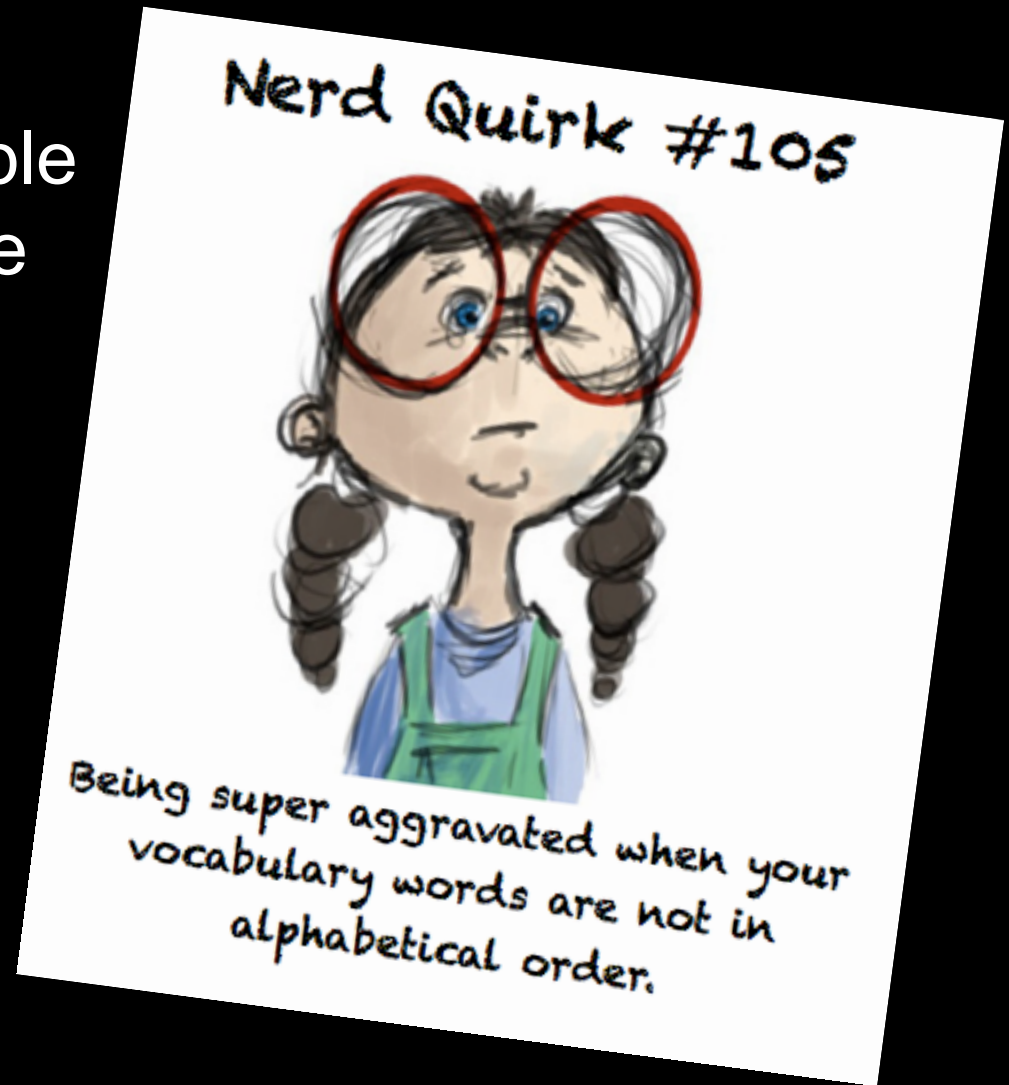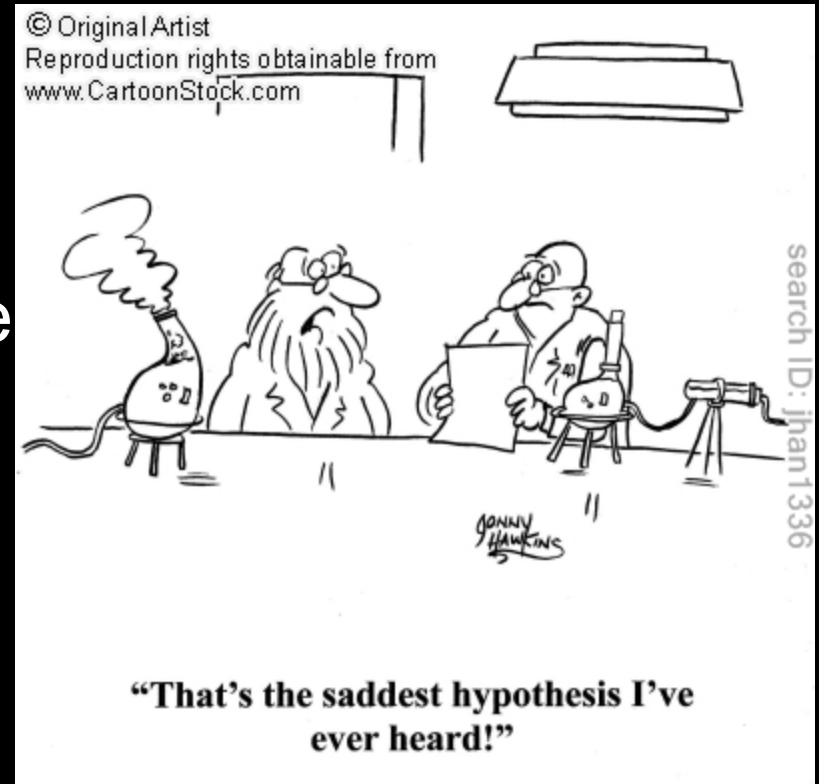
What is a Hypothesis?

- A **<u>hypothesis</u>** is often referred to as an "educated guess".
  - Why is it called an *educated guess* vs. just a *guess*?

- A **<u>hypothesis</u>** is a reasonable explanation of why something may have happened or a prediction of what might happen. It is the explanation of the possible cause of a problem or a possible solution to a problem.

What is a Hypothesis?

The **hypothesis** may or may not be supported by the experimental results.

- – It is often stated in terms of an independent variable and a dependent variable.
- – Cause and Effect relationship
- – "If…then…because…"

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"That's the saddest hypothesis I've ever heard!"

What is a Hypothesis?

The results of an experiment CANNOT prove a hypothesis is correct. Instead, the results of an experiment **support or do not support the hypothesis**.

When hypotheses are tested over and over again and not contradicted, they may become known as **laws** or **theories**.

Example

Imagine that you are sitting at home, watching television, and suddenly your lights go out.

What would you do?

Question & Hypothesis Practice

1. What effect does the water temperature have on solution rate?

2. What effect does crushing the tablet have on solution rate?

3. What effect does adding soda to the water have on solution rate?

Source of Scientific Information

Credible = Trustworthy

Accurate = Correct

Relevant = Applicable to Topic