How to Write a Good Hypothesis

What is a Good Hypothesis?

A hypothesis is a tentative statement that proposes a possible explanation to some phenomenon or event. A useful hypothesis is a **testable** statement which may include a prediction.

The key word is **testable**. That is, you will perform a test of how two variables might be related. This is when you are doing a real experiment. You are testing variables.

How Are Hypotheses Written?

1. Chocolate may cause pimples.
2. Adding fertilizer may affect plant growth.

These are examples of hypotheses because they use the tentative word "may." However, their form is not particularly useful. Using the word "may" does not suggest how you would go about proving it. One way to prevent making such easy mistakes is to formalize the form of the hypothesis.

Use the "If…, then…, because…" format.

"If…(describe a change in the manipulated variable), then…(tell how the responding variable will react to the change), because…(explain your reasoning or tell why something will happen)"

Independent or Manipulated variable: This is the variable that you, the scientist, change or manipulate. This is the "cause" in the experiment and is the same as the independent variable in math class.

Dependent or Responding variable: This is the variable that "responds" to changes in the manipulated variable. This is the "effect" in an experiment and is the same as the dependent variable in math class.

Controlled variables: These are variables that are kept the same in all experiments to minimize scientific error, and to isolate the manipulated variable.

Example:
Experimental/Problem Question: How does fertilizer affect plant growth?

Hypothesis: If I increase the amount of fertilizer on grass plants, **then** the grass *plants will grow taller*, **because** plants will have more nutrients to grow taller provided by the fertilizer increase.

Amount of fertilizer = manipulated variable
Plant growth = *responding variable*

Controlled variables in this experiment would be the amount of water and light the plants they would receive, and the overall growing environment.

Practice: Write possible hypotheses to the following

1. Plant growth may be affected by the color of the light.

2. Bacterial growth may be affected by temperature.

3. Ultra violet light may cause skin cancer.

4. Temperature may cause leaves to change color.

5. The level of acid in a lake affects how many fish live there.