#  Elements of a Good Hypothesis

What Makes a Good Experimental Hypothesis?

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A [hypothesis](http://chemistry.about.com/od/scientificmethod/f/What-Is-A-Hypothesis.htm) is an educated guess or prediction of what will happen. In science, a hypothesis proposes a relationship between factors called [variables](http://chemistry.about.com/od/sciencefairprojects/a/What-Is-A-Variable-In-Science.htm). A good hypothesis relates an independent variable and a dependent variable. The effect on the dependent variable *depends* on or is determined by what happens when you change the independent variable. While you could consider any prediction of an outcome to be a type of hypothesis, a good hypothesis is one you can test using the scientific method. In other words, you want to propose a hypothesis to use as the basis for an [experiment](http://chemistry.about.com/od/introductiontochemistry/a/What-Is-An-Experiment.htm).

**Cause and Effect or If, Then Relationships**

A good experimental hypothesis can be written as an "if, then" statement to establish cause and effect on the variables. If you make a change to the independent variable, then the dependent variable will respond. Here's an example of a hypothesis:

*If you increase the duration of light, then corn plants will grow more each day.*

The hypothesis establishes two variables, length of light exposure and rate of plant growth. An experiment could be designed to test whether rate of growth depends on duration of light. The duration of light is the independent variable, which you can control in an experiment. The rate of plant growth is the dependent variable, which you can measure and record as data in an experiment.

**Checklist for a Good Hypothesis**

When you have an idea for a hypothesis, it may help to write it several different ways. Review your choices and select a hypothesis that accurately describes what you are testing.

* Does the hypothesis relate an independent and dependent variable? Can you identify the variables?
* Can you test the hypothesis? In other words, could you design an experiment that would allow you to establish or disprove a relationship between the variables?
* Would your experiment be safe and ethical?
* Is there a simpler or more precise way to state the hypothesis? If so, rewrite it.

**Key Info**

* A hypothesis is an educated guess about how things work.
* Most of the time a hypothesis is written like this: "If \_\_\_\_\_[I do this] \_\_\_\_\_, then \_\_\_\_\_[this]\_\_\_\_\_ will happen." (Fill in the blanks with the appropriate information from your own experiment.)
* Your hypothesis should be something that you can actually test, what's called a **testable** hypothesis. In other words, you need to be able to measure both "what you do" and "what will happen."

**Hypothesis Examples**

**Directions Highlight/underline the independent variable. Circle the dependent variable.**

* If you turn out all the lights, you will fall asleep faster.
* If you drop different objects, they will fall at the same rate.
* If you eat only fast food, then you will gain weight.
* If you use cruise control, then your car will get better gas mileage.
* If you apply a top coat, then your manicure will last longer.
* If you turn the lights on and off rapidly, then the bulb will burn out faster.