**What are Independent and Dependent Variables?**

Many people have trouble remembering which is the independent variable and which is the dependent variable. An easy way to remember is to insert the names of the two variables you are using in this sentence in they way that makes the most sense. Then you can figure out which is the independent variable and which is the dependent variable:

(Independent variable) causes a change in (Dependent Variable) and it isn't possible that (Dependent Variable) could cause a change in (Independent Variable).

**Dependent Variable:**This is the output variable what you are really interested in monitoring to see if it was affected or not.  It can also be called the “measured variable,” or the “responding variable,” I think it is easy to remember this one because it is dependent on the other variables.

**Independent Variables**: These are the individual variables that you believe may have an effect on the dependent variable.  They are sometimes called ““manipulated variables,” or “controlled variables.”

**Question:** What's a variable?

**Answer:** A variable is an object, event, idea, feeling, time period, or any other type of category you are trying to measure. There are two types of variables-independent and dependent.

**Question:** What's a dependent variable?

**Answer:** It is something that depends on other factors. For example, a test score could be a dependent variable because it could change depending on several factors such as how much you studied, how much sleep you got the night before you took the test, or even how hungry you were when you took it. Usually when you are looking for a relationship between two things you are trying to find out what makes the dependent variable change the way it does.

**Question:** What's an independent variable?

**Answer:** An independent variable is exactly what it sounds like. It is a variable that stands alone and isn't changed by the other variables you are trying to measure. For example, someone's age might be an independent variable. Other factors (such as what they eat, how much they go to school, how much television they watch) aren't going to change a person's age. In fact, when you are looking for some kind of relationship between variables you are trying to see if the independent variable causes some kind of change in the other variables, or dependent variables.

Here are a couple of examples.

**Example #1: Golf Balls**

Here’s a simple situation:  Suppose you want to test golf ball flight distances, so you set up a simple experiment in which various golf balls are placed into a mechanical chute and fired into the air.  The variable you really care about, the “output” or **dependent variable** is golf ball distance.  **Independent variables** are the variables you are going to test to see how they affect distance.  In this case, they are going to be things like air temperature, golf ball brand, and color of the golf ball. See how all the independent variables (air temp, brand, color) have an effect on the dependent variable (distance)?

Write a hypothesis for this experiment: (Follow the If….then… model) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Example #2: Ice Cubes**

Here’s another example:  Imagine that you have a bunch of ice cubes and you want to test how long it takes them to melt in various situations.  You have an experiment with 1,000 equally shaped ice cubes.  Some of them are made of frozen cranberry juice.  You are going to set some of them on a metal sheet and others are going to be placed on a wooden plank.  Air temperature, wind, and every other condition you can think of will remain constant.  So, in this case, your ***dependent variable*** is ice cube melting time.  Your **independent variable is**: melting surface (metal or wood).

Write a hypothesis for this experiment: (Follow the If….then… model) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_