



# Chugach Science Share

## Planning an Experiment

Planning is an important start to every successful science fair project. Keep it simple. Make an observation about the world. Then ask a **measurable question** about that observation. Next, do some **research** and narrow down the topic. A common problem is choosing a broad topic that emulates a PhD study. Narrow down the ideas to a small project that you can repeat several times over the next several weeks. It is important to pick something you can easily repeat several times over the next several weeks. It is important to pick something you can easily repeat a few times. To start, you will want to research background information with books from the library and online resources. Online resources are listed on the Chugach Science Share webpage.

### Variables

You've made an observation about the world, you've started to think about your **measurable question** which will help you design your experiment. You've done a little research about that topic. Now decide on the **variables** you will change in your experiment. A variable is something that you manipulate in an experiment. A variable is any factor, trait, or condition that can exist in differing amounts or types. An experiment usually has three kinds of variables: **independent**, **dependent**, and **controlled**.

For instance, you might ask: Does changing a cake recipe affect how much it rises? You could make the same recipe 3 times: once without any baking soda, once with 1 tablespoon of baking soda, and once with 3 tablespoons of baking soda. The amount of baking soda is your **independent** variable. What do you observe? The Height the cakes rise. Height is the **dependent** variable because it depends on the amount of baking soda. The amount of salt, flour, eggs, etc. are kept the same and are the **controlled** variables.

If you change too many things at once then it's harder to determine the impact of each variable. If you change one ingredient at a time then you are changing one variable and can see the impact of the change. If you change several amounts or types of ingredients at the same time then you don't know specifically why the cakes turned out differently.

Want more examples about variables? Check this link out:

[http://www.sciencebuddies.org/science-fair-projects/project\\_variables.shtml](http://www.sciencebuddies.org/science-fair-projects/project_variables.shtml)