

## Scientific Method Notes

Observations- using your five senses to gather information. Observations may be quantitative (involving numbers) or qualitative (characteristics that cannot be easily measured or counted).

Problem- anything you are curious about or anything you want to solve.

Research- Conduct research on the topic that will be tested.

Hypothesis- a possible explanation for a set of observations or an answer to a scientific question. A hypothesis must be testable.

If \_\_\_\_\_ then \_\_\_\_\_.  
(independent variable) (dependent variable)

*Independent variable = what is manipulated; what is being tested (this is the only thing that should be different between the control and experimental group)*

*Dependent variable = what is being measured (qualitatively or quantitatively)*

Write a Procedure: Make sure to have a control and experimental group. Between these two groups, the only thing that should be different is the variable that you are testing (independent variable).

Test/Experiment- a test designed to determine if your hypothesis is right or wrong. The factors in an experiment that can change are called variables. Ex.-equipment, type of material, amount of material, temperature, light and time. Whenever possible, a hypothesis should be tested by an experiment in which only one variable is changed at a time. All other variables should be kept unchanged, or controlled. The variable that is deliberately changed is called the manipulated variable. The variable that is observed and that changes in response to the manipulated variable is called the responding variable.

Analyze Results & Conclusions- scientists use the data from an experiment to evaluate the hypothesis and draw conclusions. Analyze data in charts and graphs. They use evidence from the experiment to determine whether the hypothesis was supported or refuted.

*As evidence from numerous investigations builds up, particular hypothesis may become so well supported that scientists consider it a theory. A theory enables scientists to make accurate predictions about new situations.*