

## Scientific Method

### What is it?

- The process used to find answers to questions about the world!

### Is there only one?

- Nope - there are many versions but they all have the following steps in common.



### Steps

1. Ask a Question
2. Do Background Research
3. Construct a Hypothesis
4. Test Your Hypothesis by Doing an Experiment
5. Make Observations
6. Analyze Data and Draw a Conclusion

**Purpose/Question-** What do you want to learn? What is the problem to be solved?

**Research-** Find out as much as you can about the topic.

**Hypothesis-** Predict the answer to the problem. This is usually stated like " If I...(do something) then...(this will occur)"

**Experiment-** The fun part! Design a test or procedure to find out if your hypothesis is correct.

**Observations-** Use your senses to observe information about what happened during the experiment. Record this data.

**Analysis & Conclusion-** Review the data. Check to see if your hypothesis was correct. Summarize the experiment.

## Additional Terms to Know

Experiments include two types of variables (things that change):

### Independent Variable

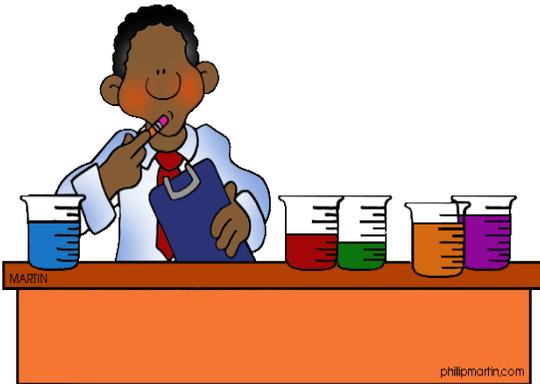
- This is the part of your experiment that you will change on purpose to test your hypothesis.

### Dependent Variable

- This is what occurs in response to the changing independent variable.

### Control Group

- It is part of the experiment where you do not include the Independent Variable. The control helps you judge your experimental results.



Observations can be:

### Quantitative

- Information gathered by measuring

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### Qualitative

- Information gathered by observing (using your senses)

When making observations, be careful not to make inferences! Inferences come later, when you analyze your data and draw conclusions.

### Inference

- A conclusion reached on the basis of evidence and reasoning (i.e. how we explain the meaning of our observations).

E.g. Observation: The plant is turning yellow.

Inference: The plant is yellowing because it doesn't get enough sunlight.