**Bio I**

**Scientific Method**

- Steps in the scientific method

1. **Identification of a problem**: The first step toward scientific discovery takes place when a scientist observes something no one has noticed before.

2. **Hypothesis** (testable prediction): A statement that can be tested and presents a possible solution to a question.

3. **Experiment**: After making a hypothesis, the next step is to test it. An experiment is a formal method of testing a hypothesis.

4. **Data collecting and analysis**: Data can support or disprove a hypothesis.

5. **Derive a conclusion/theory**: A theory is a hypothesis that is supported by a large body of scientific evidence.

6. **Report findings**: Results of an experiment are useful only if they are made available to other scientists.

- What is a variable?

A variable is something that can be changed in the experiment. It is what you are testing. Everything else must be the same and only one variable or condition is altered or changed.

- What is a controlled experiment?

In a controlled experiment, two groups are tested and all conditions except one are kept the same for both groups.

- Example of a controlled experiment

- **Question**: How will the amount of fertilizer used affect plant growth?

- **Hypothesis**: I

- **Test variable**:

- **Test constants**:

- **Analysis of data**:

- **Conclusion**:

Which plant group grew the most? Why or why not? What would you do differently next time?

- What is the difference between qualitative and quantitative data?

Qualitative data, also known as descriptive data, focuses purely on observations. Quantitative data focused on comparing numerical values.

- Examples:

1. The high temperature for today is 60°: Quantitative
2. My cat has one green eye and one blue eye: Qualitative
3. I found 134 puffballs on a rotten log: Quantitative
4. A graph showing carbon dioxide emissions in Brevard for the year 2002: Quantitative
5. My deck was covered with water this morning so it must have rained last night: Qualitative