What is the Scientific Method?

There are six steps in the scientific method:

1. **Purpose**
   What do you want to learn?

2. **Research**
   Find out as much about your topic as you can.
   Find information in various materials to help form a hypothesis and make a logical guess about the experiments’ outcomes.
   
   **Research resources**
   - Written materials
   - Books, magazines, pamphlets, etc.
   - Libraries
   - Internet
     - Use .gov, .edu, and .org
     - No Wikipedia

3. **Hypothesis**
   Predict the answer to the problem
   Should include:
   - The focus of the experiment
   - What’s being measured?
   - Conditions
   - Expected results
   “If… then” statement. Example: If I increase the amount of fertilizer I put on a plant then the plant’s height will grow more than 12cm tall.

4. **Experiment**
   Design a test to confirm or disprove your hypothesis.
   **Steps:**
   1. Decide which controls and variables should be used.
   2. Determine the length of the experiment.
      How long should it last?
   3. Use trial and error
      A true scientist believes that all experimental errors are important.
   4. Replication
      Results must be replicated to be trusted
      Test at least 3 times
   5. Be a good observer
   6. Measure exactly
Variables
Variables are something that you change during the test.

An Independent Variable is a variable that stands alone and isn't changed by the other variables you are trying to measure.
Example: amount of fertilizer

A Dependent Variable is something that depends on other factors
Example: growth of the plant

A Control is a variable that is unchanged
Example: The plant that does not receive any fertilizer

A Constant is what you hold constant
Example: sunlight, the amount water, type of soil, type of plant

5. Analysis
Record what happened during the experiment
Steps:
1. Collect data
2. Observations made during experiment
   What steps were important for the experiment?
   What did I do that had the greatest effect on the experiment? The least? No effect?
   What facts, numbers, or information developed from the experiment?
3. Errors noted

6. Conclusion
Was your hypothesis correct?
Explain what was learned from your experiment.
Should be brief