Scientific Method Unit Study Guide

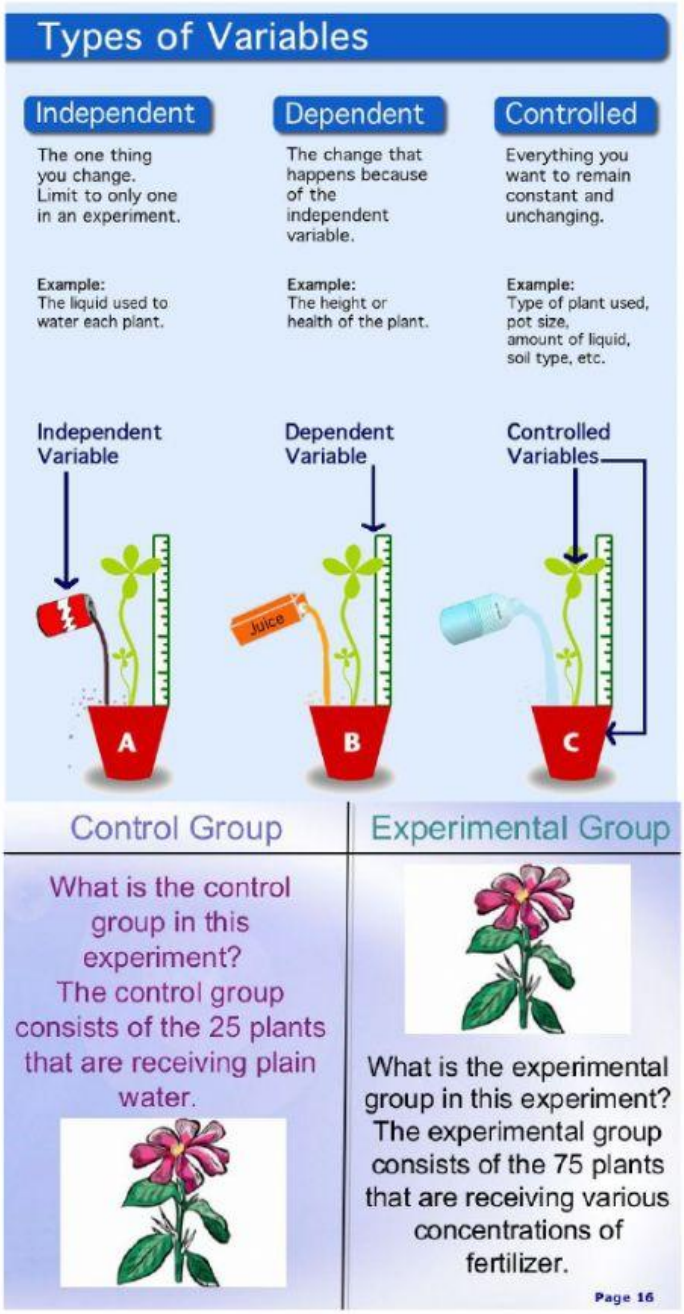
Important Terms

[Independent Variable]: The variable the scientist *chooses to change*

[Dependent Variable]: The results of the experiment, usually a *measurement*

[Constants]: The things that remain the *[same]*

- Constants are important because good scientists only change [one] thing during an experiment. This helps us see that whatever happens is because of the one thing we decided to change.
- On our twirlers, we only changed [blade length] If we changed both length and width, how would we know which thing slowed our twirler down?
- Other constants: drop height, how we hold the twirler, the person who uses the timer, type of paper



[Control group]:

- The group within the experiment where [nothing] is changed.
- It provides something to [compare] the experimental group with.
- Think about the Control Twirler! This was the first twirler we made when we [did not] change the blades at all.

[Experimental Group]:

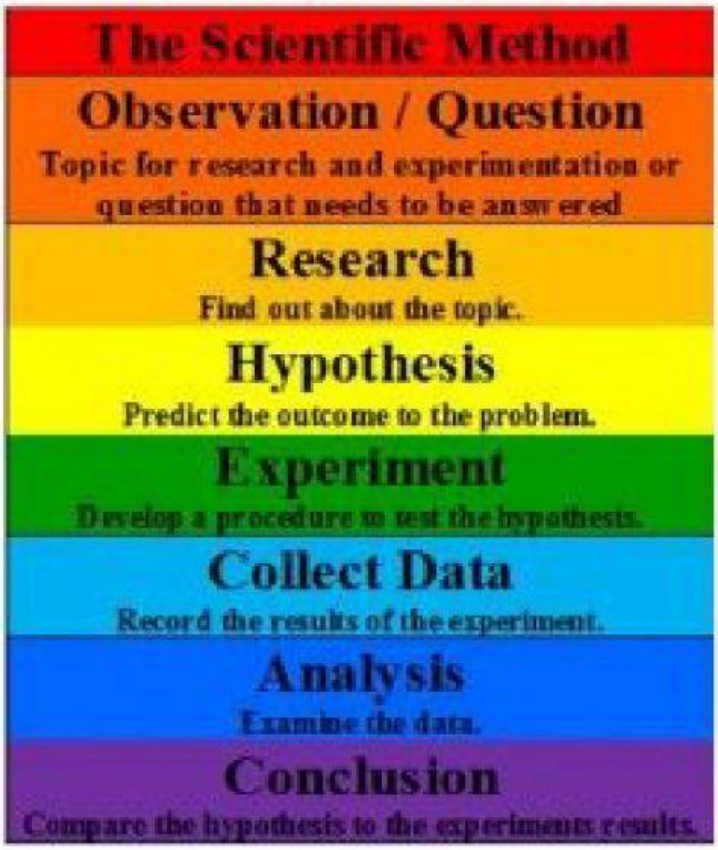
- The group within the experiment where we [change] one variable.
- It is the group we are ["experimenting"] on.
- Second Twirler we made where we [changed] the blade length or blade width.

Steps of Scientific Method

1. **Identify the Problem – Always in the form of a question.**
   - [Do tomato plants need sunlight to produce tomatoes?]

2. **Gather Information- Research, Prior-Knowledge, Observations**
   - Edward uses the Internet to learn more about tomato plants.

3. **State the Hypothesis – Prediction using "If...,Then"**
   - If the plants receives the full 10 hours of sunlight, then it will produce a lot more tomatoes.



4. **Test the Hypothesis – Procedure: What steps do we do to perform the experiment**
   - 1. Edward puts two plants in the window of his living room.
     2. Edward puts another two plants in his bedroom.
     3. Edward records the amount of sunlight each plant receives

5. **Make Observations – Collect data using measuring tools and the 5 senses**
   - For two months, Edward looks at plants daily and records observations. He records the plant height each day.

6. **Analyze Data- Make sense of data using charts, tables, graphs and images.**
   - Edward creates a graph of daily plant heights and number of tomatoes.

7. State the Conclusion – Summarize Results. Should clearly state if hypothesis was supported or not supported. Uses data to explain if hypothesis was supported or not.

- If the plants receives the full 10 hours of sunlight, then it will produce a lot more tomatoes.My hypothesis was supported. The plants that received 10 hours of light grew 10 tomatoes. The plants that received 5 hours of light only grew 5 tomatoes.