Scientific Process Notes

What is the scientific process?

- It's a logical, problem solving technique. The _____ is an excellent example of scientific process.

1. **Observation vs Inference**
   - **Observation** is important in the scientific process
   - An_____ is a _____ or _____ fact. There is ***NO OPINION*** involved.
   - An _____ is an _____, or conclusion, based on observed facts.
2. **Problem Statement**
   - Careful observations lead to questions.
   - A **problem statement** is a question that compares _____.
     - *Example*: Does the drop height affect the bounce height of a superball?

       Example: How does the percent of dissolved oxygen in water affect the life span of algae?
3. **Variables**
   - A _____ is something that _____ during your experimental procedure. There are independent variables and dependent variables.
   - Explain what a control is.
4. **Independent Variable**

   An _____ **variable** is a variable that we manipulate - _____.

   An **independent variable** is the variable whose value _____an experiment.

   Example: Does the **drop height** affect the *bounce height* of a superball?

   *We know the **drop heights** we will use.*

   Example: How does the percent of dissolved oxygen in water affect the life span of algae?

   *We know the **different percentages** of oxygen we will use.*
5. **Dependent Variable**

   A _____ **variable** is a variable that changes _____ _____ (depends on the independent variable).

   The **dependent variable** is the variable whose value _____– it's the "_____" we are looking for at the _____ of the experiment.

   Example: Does the drop height affect the **bounce height** of a superball?

   *We **do not know** the **bounce heights** before we start.*

   Example: How does the percent of dissolved oxygen in water affect the life span of algae?

   *We **do not know** how long the algae will live.*

6. **What is a Constant?**

A _____ is a variable that _____ for the duration of an experiment; a value that remains the same.

Example: Does the drop height affect the bounce height of a **superball**?

The **superball** does not change during the experiment.

Example: How does the percent of dissolved oxygen in water affect the life span of **algae**?

The **amount and type of algae** used does not change during the experiment.

Other constants in the experiment:

*_____ of water

*_____ of water

*_____ of aquarium

*time of day measurement taken

7. **Data Collection**

_____ **data –**

- Deals with _____.
- Data can be _____ but _____.
- Colors, textures, smells, tastes, appearance, etc.
- **Qualit**ative → _____

_____ **data –**

- Deals with _____.
- Data which can be _____.
- Length, height, area, volume, weight, speed, time, temperature, humidity, sound levels, cost, members, ages, etc.
- **Quantit**ative → _____

Why do we use graphs?

- Graphs help us _____ numerical data.
- There are several different types of graphs:
- Bar graph - Bar graphs are used to show a _____ of multiple objects.
- Pie graph - Pie graphs are used to compare the _____ of a _____.
- Line graph - Line graphs are used to show the _____ between _____.