**Basic Lab Report Format (5th grade through college)**

* Younger children (K- 4th) would use a simpler, pre-made answer sheet or write a **Focus Question** to be answered and a simple data table or labeled drawing of observations, etc**. Reflection** would also be a good item to include at end.

1. **Problem**: The question you are trying to answer.
2. **Hypothesi**s: An educated guess about what you think the solution is. Usually worded as If…then” statement. Ex. “if the amount of water in the film canister increases, then the reaction time will be faster.”
3. **Materials**: The list of all equipment and supplies, for school labs can be main ones to save time.
4. **Procedure**: The step-by-step instructions of how to perform the experiment- can be see handout or see page 3, etc. to save time for school labs.
5. **Observation: (Data, Results**): All of the results of the experiment, can include tables, graphs, visual observations, must include dates.
6. **Discussion, Conclusion**: What was the result of the experiment? Was your hypothesis supported or not? What future experiments do you think could be done that would yield further, better results? What might be done differently?

**Types of Variables**

|  |  |  |
| --- | --- | --- |
| Type of Variable | Definition | Example |
| **Independent (manipulated**) | This is the one that you change deliberately. Experiments should only have **one** **independent** variable. | If you wanted to know how fertilizer affects plant growth, the amount of fertilizer given to each plant is the only variable you would change. |
| **Dependent (responding)** | This is the variable that is being observed, which changes in response to the independent variable. | In the fertilizer experiment, the responding variable would be the size of the plants(measured in metric units like cm). |
| **Controlled** | Variables that are kept **constant** are called controlled variables. These are all the things that are kept the same in your experiment. | Controlled variables in the fertilizer experiment would include factors such as the amount of light and water given to each plant, the type of soil used, the size of the pot, and temperature. |

**Examples:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Experimental Question** | **Independent (manipulated) variable** | **Dependent (responding)**  **variable** | **Constant** |
| Does temperature affect how long soap bubbles last? | temperature | time soap bubbles last (seconds) | type of soap used |
| Which color of light causes beans to grow best? | color of light | growth (size-cm) of plants | amount of light and water given to each plant, the type of soil used, the size and type of pot, and temperature |
| Does the mass of an object affect the speed at which it falls? | mass | time (seconds) | distance object falls, type of object (material, shape) |
| How does the angle of a ramp affect the speed at which an object will travel? | angle of ramp | time (seconds) | Length of ramp, type of object |

**Data Tables, Charts, and Graphs**

They are very important in reporting information. Most of the time a chart contains words or descriptions while a table usually contains numbers. You must always give your chart, table, or graph a title according to the information it is giving.

There are several ways to communicate data. You can use pictures, draw diagrams, take photographs, and show graphs. The most common types of graphs are the line graph, bar graph or histogram, and pie graph. The line graph shows progression or change over time. Bar and pie graphs are typically used to compare things. Remember you must always have a title on any method you choose and list units used on correct axes.

Line graphs are labeled in a special way. The x-axis is where you place the independent variable. Place the quantity and units (cm, etc.) below the line. For example in the bubble experiment you would place the temperature along the x-axis, in degrees Celsius. The dependent variable goes on the y-axis. Also include units. In the soap bubble experiment, the dependent variable would be the length of time the soap bubbles last, in seconds.