Popcorn Lab Design Rubric

Title:

- Does the title grab the attention of the reader?
- Does the title mention, "The Effect of (Independent Variable or IV) on (Dependent Variable or DV)"?
- THE POPCORN LAB… is not acceptable

5	4	3	2	1	0
Interesting and Creative Title that grabs your attention and discusses the IV and DV	Title that Discusses the IV and DV	Title that discusses **EITHER** the IV or DV	**Creative** title, but there is **NO** mention of the IV or DV	**Weak** Title with **NO** mention of the IV or DV	**NO** Title or the title is "The Popcorn Lab"

Dates:

Are the dates the lab was completed listed?

2	1	0
Completely identifies both dates of experimentation	Dates are mentioned, but incomplete	No dates of experimentation are given

Purpose:

Is the purpose of the lab stated?

4	3	2	1	0
The purpose of the lab is clearly stated. It mentions **all** of the following: Making popcorn, using the scientific method, and implementing laboratory design	The purpose addresses **two** of the following: Making popcorn, using the scientific method, and implementing laboratory design	The purpose addresses **one** of the following: Making popcorn, using the scientific method, and implementing laboratory design	The purpose addresses **none** of the following: Making popcorn, using the scientific method, and implementing laboratory design	No purpose was identified

Materials:

Are all of the materials listed?
Are they separated into equipment and chemicals
Are all of the materials organized into some fashion? Alphabetical? Order of usage?

4	3	2	1	0
ALL of the materials are listed, They are **ALL** correctly separated into Equipment and Chemicals, and they **ALL** follow some sort of organization	There are a **FEW** mistakes in this section	There are a **SOME** mistakes in this section	There are a **MANY** mistakes in this section	There is **NO** materials section

Procedure:

- Is it written in stepwise format 1., 2., 3., 4., etc,
- Is this the procedure to make the best recipe of popcorn?
- Is it written as verbal commands?
- Does it follow a logical order?
- Is it easy to understand?
- Do you know exactly what to do to reproduce this recipe?
- There are no "understood" procedures.
  (Such as: get out equipment or turn on gas.)

4	3	2	1	0
Addresses **ALL** of the elements listed above	Addresses **MOST** of the elements listed above	Addresses **SOME** of the elements listed above	Addresses **FEW** of the elements listed above	Addresses **NONE** of the elements listed above

Data:

- Are the tables clearly numbered and have a title?
- Does the title of the data tables clearly communicate the purpose of the experiment by referring to the variables under investigation? Often the following convention is used for the title: "The Effect of (the IV) on (the DV)."?
- Is all pertinent information recorded, accurate, and organized?
- Are the tables easy to read and understand?
- Is the data organized so that the IV in the left column and the DV in the right?
- Was the quantitative data recorded with the appropriate unit of measurement?
- If values are used for the IV, are they ordered either from smallest to largest or vice versa?
- Are the qualitative observations written as simple comments, using proper vocabulary and are grammatically correct?

4	3	2	1	0
Data and observations include **ALL** of the elements required	Data and observations include **MOST** of the elements required	Data and observations include **SOME** of the elements required	Data and observations include **FEW** of the elements required	Data and observations include **NONE** of the elements required

Data Analysis

Calculations and Graphs:

- Did they need to show any calculations?
- If so, did they show the calculation and how to solve it?

Displaying Data:

- Is there a graph to visually display the data?
- Were they completed using Microsoft Excel?
- Is the IV on the x-axis, and the DV on the y-axis?
- Was the appropriate type of graph used?
    - A bar graph is useful for comparing information by counting.
    - A circle graph, or pie graph, is used to show how some fixed quantity is divided into parts.

4	3	2	1	0
ALL observations and data are transformed, manipulated, and effectively presented	**MOST** observations and data are transformed, manipulated, and effectively presented	**SOME** observations and data are transformed, manipulated, and effectively presented	**FEW** observations and data are transformed, manipulated, and effectively presented	**NONE** of the observations and data are transformed, manipulated, or effectively presented

Writing a Conclusion:

A well-written conclusion:

- Is written concisely, without unnecessary or redundant information.
- Restates the hypothesis or prediction of the outcome.
- Contains a brief account of the procedure.
    - Do not discuss amounts or specific procedures.
- Summarizes the essential lab data.
- Uses the observations and/or data appropriately to support the conclusion.
- Shows how the essential data answers the lab question.
- Uses scientific language to convey an understanding of the science concepts involved.
- Uses past tense and avoids the use of personal pronouns.
- Is organized into paragraphs which divide the information logically.
- Clearly communicates the conclusion.

8	7	6	5	4	3	2	1	0
ALL of the experimental results, procedures, and questions are thoroughly evaluated.		**MOST** of the experimental results, procedures, and questions are thoroughly evaluated.		**SOME** of the experimental results, procedures, and questions are thoroughly evaluated.		**FEW** of the experimental results, procedures, and questions are thoroughly evaluated.		**NONE** of the experimental results, procedures, and questions are thoroughly evaluated.

Discussion of Theory (Experimental Design):

Hypothesis:

- Does the hypothesis predict the relationship between the independent variable and the dependent variable?
- Is it written as an "If..then.." statement.
    - If the (IV) is (how the IV is changed in the experiment), then the (DV) will (describe the predicted effect).

Independent Variable (IV):

Are the levels of the IV clearly identified?
Is there a control in the experiment? Not sure…
Was the IV omitted as the control?
Was there an outside standard chosen as a control?
Was the number of repeated trials the same for each level of the variable?
Were there at least two repeated trials for each level?

Dependent Variable (DV):

How was the DV measured?
What was the unit of measure?
If the DV was counted or observed objectively, was a scale developed with which to compare non-measurable results?

Constants:

To produce valid data related to the effect of changing the independent variable did the experimenter only change one variable at a time?
Were all other potential variables held constant?

It is important that the procedure must be so clearly written so that all people who read it will know how to do the experiment the same way. Was it clearly indicated how much ___, what type/brand of ___, and when ___ was used/applied.)

10	9	8	7	6	5	4	3	2	1	0
Addresses **ALL** of the components and aspects of experimental design			Addresses **MOST** of the components and aspects of experimental design			Addresses **SOME** of the components and aspects of experimental design			Addresses **FEW** of the components and aspects of experimental design	Addresses **NONE** of the components and aspects of experimental design

Experimental Sources of Error:

- Did they come up some experimental sources of error?
- Did they explain how these errors influenced their data?
- Did they talk about how to improve their experimental design?
    - Were they able to identify the one area of the lab most likely responsible for measurable experimental error?
- What would they do differently next time to improve their results?
- Instrumental and Human error SHOULD NOT be mentioned, unless a serious mistake or significant fault occurred.

4	3	2	1	0
Addresses **ALL** of the elements listed above	Addresses **MOST** of the elements listed above	Addresses **SOME** of the elements listed above	Addresses **FEW** of the elements listed above	Addresses **NONE** of the elements listed above

Style and Mechanics:

- Was the correct format of the lab report followed?
- Grammar?
- Spelling?
- Organizations?
- Clarity?
- Overall Presentation?
    - Report is neatly printed in ink, with no visible corrections.

4	3	2	1	0
Addresses **ALL** of the elements listed above	Addresses **MOST** of the elements listed above	Addresses **SOME** of the elements listed above	Addresses **FEW** of the elements listed above	Addresses **NONE** of the elements listed above