

Scientific Method: Lab Write-Up Format

Framing the Investigation

Step 1 Problem Statement: States the problem to be investigated in a clear manner in such a way that it defines what the problem is.

Observation

1. Growling stomach
2. Homework and tests
3. Vitamin C and the common cold
4. Education and income (money)

Problem Statement



Step 2 Background Information: information that is related to the _____

- _____ of the matter involved in the problem and its behavior, properties and/or characteristics (_____ doing the lab)
- Identify and explain science terms and concepts that are related to the _____
- Explicitly _____ the background information is related to the problem

Example

Observation: Stomach is growling

Problem: Why is my stomach growling?

Background Information:



Step 3 Hypothesis:

- Possible _____ to the problem that can be tested.
- Gives a _____ for the investigation.
- Tests only one _____ at a time!

Written In an IF ... THEN ... BECAUSE format

- **IF:** the condition, what will be _____ the variable
- **THEN:** the expected _____, what we think will happen
- **BECAUSE:** the scientific _____ you will get the expected outcome

Problem Statements

Hypothesis

1. Is my stomach growling because I'm hungry?
2. What is the relationship between doing homework and test scores?

Problem Statements

Hypothesis

- 3. Does Vitamin C prevent colds?
- 4. Does going to college mean earning a higher income?

Designing the Investigation

Step 4 Designing the Investigation / Procedures

- Diagram of lab with all equipment _____
- Detailed procedures: a list of _____ that are numbered, and can be fully replicated (followed)
- Accurate application of scientific knowledge; using scientific words _____
- Safe and ethical design with _____ symbols given
- Procedures that will provide data that can be _____, collected and reviewed



Example: Growling Stomach Lab Procedures

Diagram:

Materials:

Safety:

Procedures:

- 1.
- 2.
- 3.
- 4.
- 5.

Step 5 Collecting and Presenting Data

- Records accurate data consistent with planned _____
- Displays (e.g. Tables) for observations and measurements and all _____ are labeled
- Transfers data into _____ displays/formats that highlight information and patterns
- Observations vs. Inferences
- Measurements are Precise to _____ decimals (), and as accurate as possible

General Observations

Smell	Feel/Touch	Hear	See



Five Commandments of Graphing

1. Title _____
2. Label Axis with _____ and _____
3. Use all _____ on graph
4. Make data points highly _____
5. C_____ data points
with a line or curve, as best fits

Analysis and Conclusion

Step 6 Conclusion: Analyzing and Interpreting Results

- States if the data does or does not support the _____
- Summarize or Paraphrase the _____ and _____
- Uses scientific terms, concepts, models _____ to **analyze** and _____ relationships investigated (that are related to the h _____)
- **Explicitly use data** to support or no nullify the conclusion which addresses the _____
- Analyzes and critique the design and procedures for _____ and improvements in next lab

Time	Temp	Time	Temp	Time	Temp	Time	Temp
.5 min	35 °C	1 min	43 °C	1.5 min	52 °C	2 min	59 °C
2.5 min	72 °C	3 min	81 °C	3.5 min	92 °C	4 min	98 °C
4.5 min	100 °C	5 min	99 °C	5.5 min	100 °C	6 min	100 °C

Example: The data collected _____ the hypothesis, the boiling point of water is _____ C. No matter how much heat is applied, small to medium to large flame, once the water was boiling, the temperature remained within _____ C of 100 C (_____ C). The 2-degree temperature change was most likely caused by _____ . For a future test, perform this experiment with _____

Example: Growling Stomach Conclusion