

Parts of an LMS Fab Lab

Title: Every lab should have a descriptive title ex: “Evaporation of Water,” or “Building Molecules.”

Purpose: Every lab has a purpose. This is WHY you are doing the lab – it usually relates to what you are studying in science.

Example: To demonstrate the difference between atoms and molecules.

Note: Sometimes the textbook will use a PROBLEM instead of a PURPOSE. The difference is that the Problem is in the form of a question (What is the difference between atoms and molecules?).

Hypothesis: This is the prediction of what you think will happen in the lab. A hypothesis is written, **If... then....**

Example: If the chemicals in the beaker are stirred, **then** the reaction will happen more quickly.

Note: If the lab is not testing anything, there may not be a hypothesis. Examples might include a microscope lab or any kind of observation lab where nothing is being tested.

Materials: This is a list of materials you will need to complete the lab. It is like the ingredients for a recipe. You should include all the needed supplies, but you do not need to include things like pencil & paper to write the lab.

Procedure: This is the step by step instructions for how to do the lab. If you are doing a lab in class, the teacher will probably give you the procedure. If you are writing the experiment (like for science project) you need to do the following:

- Make sure the procedure is detailed enough for **someone else** to repeat your experiment.
- **List and number the steps** (1, 2, 3.) do **NOT** write as a paragraph.

Results: The results section is where you write down the data you collect in your experiment.

The results should include:

- **Quantitative data:** data that is a “quantity”- measurements (time, distance, mass, etc.) displayed in either (or both):
 - o **Data table:** labeled, including units, always use metric measurements!
 - o **Graphs:** always use a ruler, include a title (y vs x), labels for each axis, even spacing and a key or legend if necessary.
- **Qualitative data:** data referring to characteristics or “qualities”-think color, shape, texture, smell.
 - o Unlike English classes, please **DO** use schematics, or drawings to illustrate concepts.

Questions: Often we ask you to answer questions. Please write both the questions and the answers in **complete sentences**.

Conclusion: The conclusion is the most important part of the lab – it summarizes everything you did-the what, how and why.

- The reader should be able to read **ONLY** the conclusion and know what you did, how & why, what problems there were and what you learned. If the reader wants more information, they can look at your results and procedure.
- Conclusions should be written in the third person. Passive voice (**DO NOT** use I, we, our, their, the group, the scientists, or any other form of possession)
- Labs are about what you observed and what you learned from this, **NOT** whether you thought the activity was boring or fun, so don't say, “the end.”, “this lab was fun”, or “once upon a time”.
- Conclusions should always be written in **paragraph form** (no bulleted points), referring to the lab so that the reader has all the information needed.

Outline for a good four paragraph conclusion:

Paragraph 1: Purpose and hypothesis

First sentence summarizes the purpose:

The purpose of this lab was to (insert your purpose here)...

Second sentence summarizes your hypothesis (educated guess) or predictions:

The hypothesis stated that if..., then... (insert your hypothesis here).

Third sentence lets the reader know what the results showed:

The results confirmed (or contradicted) the hypothesis that...(something happened or didn't happen)

Paragraph 2: Background information and vocabulary

First sentence:

Important background information needed for this lab was...

Define words from the lab, usually vocab. words from that week, explain and make connections as necessary. A list of expectations for background information is always included.

Paragraph 3: Summarize results

First sentence:

The overall results showed that... (What do the OVERALL results mean-this is your analysis! Why did this happen? DO NOT refer to specific data here.)

Second sentence:

Quantitative results were... (this is specific data referring to quantity or numbers found)

Third sentence:

Qualitative results were... (this is data referring to characteristics or qualities-think color, shape, texture, smell...)

Fourth sentence:

The data showed this because... (explain how the data proved or disproved your hypothesis.)

DO NOT list every bit of data, DON'T put data tables here, just the overall patterns.

Paragraph 4: Sources of error, changes for next time, practical applications

First sentence starts with:

Errors in this lab were...these **did/did not affect results in this lab.**

Errors –there are always sources of error–human error, things that involve opinion (i.e. qualitative data). Describe if these errors actually affected the results in this lab.

Second sentence:

To prevent these errors in the future...

Come up with a way that would prevent these errors from occurring if the same lab were to be repeated.

Third sentence:

An interesting follow-up experiment would be...

Suggest some new tests that go beyond what the original experiment tested.

Fourth sentence:

Similar experiences include...

Find a way to relate this back to something you have done in your life, it doesn't have to be a similar lab, it can be a similar experience (i.e. testing boiling point can remind you of boiling water to make spaghetti).