#  Bio 21: Formal Lab Report Directions

Researchers in biology communicate the results and significance of their work in several different ways. Although scientists may conduct lectures in person or via the media, writing in scientific journals is still the most important means of reporting scientific findings to the rest of the scientific community and the world at large. Laboratory reports are written in the same general format as these journal articles to communicate research in an effective and scientific manner.

### Title  3pts

The title should describe what the laboratory report is about. It should indicate what the experiment is trying to investigate, including the IV and DV. This should be written in the form of a statement.

 **II. Problem Definition** 5pts

1. Problem statement
2. Identification of the independent and dependent variables.
3. **Experimental Design\*** 7pts
4. State the experiment’s hypothesis.
5. Identify the control group (if used) and the experimental group(s).
6. Describe the experimental procedure that was followed in steps or paragraphs. Make sure the variables that should be held constant are clearly described.

\*This section should be written so that the reader could follow this section and be able to repeat the experiment. This section should always be written using **passive voice** (see style section for explanation).

1. **Data Presentation** 10pts

In this section, the experiment’s data should be organized and summarized. Tables, sketches, and/or graphs should be used to display the data. Written observations should also be included where appropriate.

1. Make sure that all tables, sketches, and graphs are clearly labeled. Tables: label each column. Graphs: label the axes. Sketches: label the name of the object and a measurement of magnification- for drawings of objects viewed under the microscope.
2. Each should have a title that describes what information is being represented by the table, sketch or graph. The title should be a sentence describing the overall information being displayed. It should not interpret the data.
3. Any pertinent observations should be noted in this section under the heading of Observations as well. When the observations are taken over a period of time, the time and/or dates should be listed.

1. **Conclusions**\* 20pts

The purpose of this section is to interpret the data in order to develop conclusions and to determine the validity of the experiment. The following questions should be answered in separate paragraphs:

1. Do the results support the hypothesis? How?

 Elaborate on this. Use the lab’s data for evidence that will support

 your statement about the hypothesis.

1. Are the results obtained in this experiment valid? Explain. This is actually a 2 part question:
	* + - 1. Were there any major flaws or errors in the experiment in its design or how it was carried out that could cause the results to be unreliable? Identify the flaw or error and if possible, suggest how this could be improved in a future experiment.
				2. Are the results supported by other information known about this topic? State these facts. (If these facts come from sources other than your textbook, class discussions, results of other lab groups or common knowledge cite your source.)

1. What has been learned by carrying out this experiment?

 Discuss any possible applications of the knowledge gained from this

 experiment. (This is where you show your understanding of the

 relationship between the lab and concepts discussed in class. This

 is also where you make connections between the concepts and your

 life- show how they apply to things outside of class. Cite any outside

 sources you use to get this information.) This is also a place to make

 suggestions about the kinds of experiments that should be carried

 out next to increase the knowledge about the ideas tested in this

 experiment.

\*This entire section needs to be written using **passive voice** (see Style section for explanation.)

1. **Works Cited** 5pts

Include this section only when citing information that you researches from outside sources. See the FLHS library’s web page for the correct style.

**Style**: 5pts

 All formal lab reports should be typed.

 Data tables should be done on a computer (where appropriate).

 Graphs should be hand drawn using graph paper (until further notice).

* Passive voice should be used: This is the traditional writing style of science. It shifts the reader’s attention away from the writer to the materials or subjects s/he has been testing.

This means that the **past tense** is used and words like I, we, my, us and our are NOT used. For example:

a. Active voice: I added 50 mL of salt solution to the test tube.

 Passive voice: 50 mL of salt solution was added to the test

 tube.

b. Active voice: I think that my results support my hypothesis

because it agrees with our definition

 Passive voice: The results of this experiment supported the

 hypothesis because it agrees with the definition the book.

1. Use appropriate science vocabulary should be used. This especially includes new vocabulary from the current chapter being studied. For example use the term heterotroph as opposed to herbivore or plant-eating.
2. Formal lab reports are formal papers: use proper grammar and spelling. Contractions such as don’t, can’t and won’t *are not* acceptable.

**Grading**: Most lab reports will be worth 50 points. Lab reports are not accepted once other students’ reports have been handed back. *Point values are subject to change.*

## **Points to keep in mind…**

1. Focus on the information that you can obtain from *YOUR* results. If you strongly feel that your results are the opposite of the “right” answer or are very different from other groups, see your teacher!

1. Remember that you can never be absolutely sure that your hypothesis is true no matter how good your results may appear. Your results will almost always contain some data that disagrees with your hypothesis. Your conclusion does not have to be completely positive or negative. Your data can *SUPPORT*  your conclusion; one experiment will never prove that a hypothesis is correct. Some appropriate terms to use:
2. support, confirm or verify your hypothesis
3. negate, refute or contradict your hypothesis

3. Do not wait until the night before the lab report is due to write up the whole thing!!! You should be asking Ms. S. questions and checking in all week.