

# Lab Report Writing Guide

## Mrs. Burgess

- When writing a lab report for physics, you will type your reports using Google Drive. All partners must write while signed individually into Google Drive, and there must be evidence in the revision history that both partners contributed equally.
- You must turn in your report both via [www.Turnitin.com](http://www.Turnitin.com) **and** as a hardcopy. The hardcopy is due at the start of class on the due date.
- Your lab report should follow the format described in this document.
- Do not write in first person (I, me, my, mine, myself, we, us, our, ours, ourselves). Points will be deducted for writing in first person.

### HEADING

- In the upper **left** corner, type:
  - The Authors' Names (first & last)
  - Other lab partners' names (first & last)
  - Period
  - Date

### TITLE

- The title should be a short phrase identifying the variables in the experiment or the purpose of the experiment.
  - *Example: The Effect of Heat on Gas Pressure in a Sealed, Rigid Container*

### OBJECTIVE

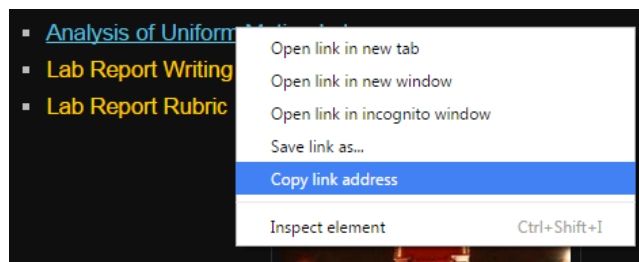
You may copy-paste these from the lab document.

### MATERIALS

You may copy-paste these from the lab document.

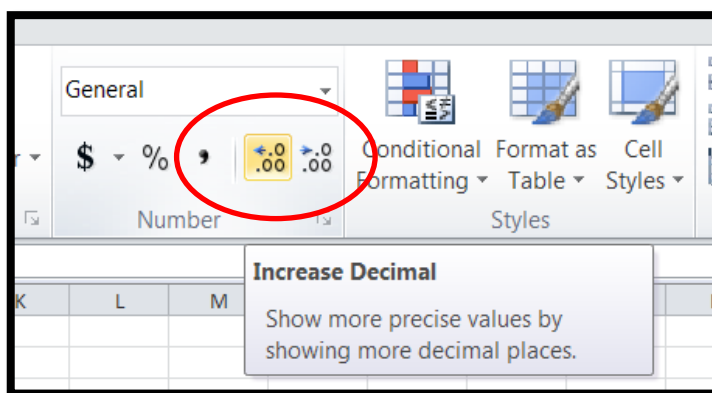
### PROCEDURE

There is no point reinventing the wheel. Simply cite the document on our website by going to the document and right-clicking on the link. Select "Copy link address" and then paste it into your lab report, stating "The procedure can be found at [insert web address]."



## DATA TABLES AND GRAPHS

- This is where you will present your recorded data and/or your qualitative observations.
- Data must be neat and well organized. Data tables must be entered via a spreadsheet program (such as Excel) and copy-pasted into the lab report.
  - All data tables must indicate in column or row headers the variables measured.
  - All data tables must indicate the units of measurement for each variable.
  - All data tables must be appropriately precise with the correct number of digits.
    - In Excel, you can adjust the digits by highlighting your data table. Then go to the “Home” tab and look at the top of your screen. In the “Number” box, you can click one of the two icons circled below to increase or decrease the decimal to the appropriate amount of precision.
    - You must also include the uncertainty of all measurements. I suggest doing this in an adjacent column after the measurement so that you can do calculations with Excel functions.



- When you create graphs from your data, you should do so using the spreadsheet program. Then copy-paste the graphs into your report. Be sure to title the graphs and label the axes with variables and units.
- Sometimes it is relevant to include a screenshot of a graph recorded by our laboratory software. You can export an image of a PASCO graph and then insert it in your lab report when needed. Be sure to title the graphs and include the axis labels in your image.
- Proper format includes keeping an entire data table on the same page rather than breaking it up across multiple pages. It also includes keeping the title of the graph with the graph itself. You may need to insert page breaks to ensure that you’ve formatted this section properly.
- **Note:** Google Drive makes inserting data tables and graphs difficult sometimes. If you are having difficulty, simply finish writing all of the text in your Google document and then export it as a Word document. You can then easily insert the graph image into the Word document.

## CALCULATIONS

- All your mathematical calculations should be labeled and organized in this section if required. (Your procedure will indicate if you need to do this. If no calculations are used, this section may be omitted.)
- You only need to show the formula > substitutions > answer. You do not have to show algebra steps. (That would be horrendous.)
- Use units for *everything*, not just the final values. This includes your substitutions.

- In many labs it will be important to perform an error analysis. Your procedure will guide you if you need to do this.

## **CONCLUSION**

In a conclusion you will summarize the results (data) of the lab and (most importantly) what they allow the experimenter (you) to conclude about the objectives of the lab.

- Address...
  - what you can **conclude** in relation to your objective.
  - what evidence from your **results** supports that conclusion.
    - Note: Do not restate all of your numbers. Instead refer to trends and, perhaps, give a small sample of numbers that represent the trends.
    - If you performed error analyses, you must refer to these as part of your evidence. (For example, if the percent difference is less than 5%, you may conclude that the results show a significant similarity between two values.)
  - **experimental error**. There is always uncertainty in your measurements, and you should acknowledge that briefly. If major errors occurred, you should address these, as well. Such errors are either systematic errors or random errors.
  - What if you know your results are wrong? Draw your conclusions based on the results anyway, regardless of whether they're right or wrong. If you know they're wrong, though, you must then say so. (Otherwise the reader (your teacher) will think you didn't realize that there was an error and will mark points off.)

Note:

- This conclusion is not the conclusion to an essay. Do not describe what you did or what this lab was about. That information is already in your objectives and your procedure and should not be repeated.
- Do not comment about how great/interesting/successful/awesome this lab was. Scientists don't care if you liked doing a lab or learned a lot. It's a cold, hard world out there. 😊