IB Physics Required Lab Report Format

To be used on all IB Required laboratory practicals unless otherwise indicated. First year we do two required labs, one each semester. Second year there are six.

# LAB REPORT FORMAT

*Before you begin writing, do the following things:*

(1) Get the notes that you took in this class and any handouts.

(2) Get notes you took as you planned and performed the experiment

(3) Read through this page and talk with your partner(s) about what you think needs to be included in each section of the report--make notes if you want to do so. ***Once you begin writing, the work should be your own individual best effort.*** You may discuss your results with your partner(s) and you will have the same data to process, but duplicate work will not be accepted.

*General Comments:*

* All final reports must be typed (except for the recording of raw data).
* Raw data and observations must be recorded as neatly as possible in blue/black ink when you are doing lab work. If you type your data later for the final report, attach the raw data and observations recorded in lab as an addendum. If you record a number in error, mark through it with 1 line (no erasures or whiteout).
* Do not write in 1st person singular (don’t use ‘I’, ‘we’, ‘he’, etc…Example of an appropriate statement: A 150 g mass was suspended from the spring.)
* In your reports, be sure to give references as needed.
* Heading of first page: write NAME, PARTNER(S), DATE PEFORMED, & DATE SUBMITTED, centered.
* You do not need a separate title page or cover page.
* You do not need an abstract.

Whenever you are writing a formal lab report, this format is your default format. Sometimes there will be additional expectations that attend an individual assignment. Sometimes parts of this format may be eliminated. The report is to be written in sections with headings as indicated below using the language forms indicated. The title does not need a heading. The heading for the Introduction/Background section is optional. Formal reports are graded out of 25 pts.

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## TITLE (descriptive)

### BACKGROUND OR INTRODUCTION

* Explains observations, information given in class, and previous information that led you to your purpose or question. You may include reasons for raising the question. If you changed the question during the course of the experiment, because of what happened or failed to happen, discuss the shift in this section. Include personal connections and/or possible global impacts, if appropriate. Write this section in *paragraph* form.

### PURPOSE/QUESTION

* Make your purpose clear. May be in the form of a *question*, an *imperative sentence*, or a short *paragraph* explaining your aim(s)*.* You may use a purpose provided by the teacher, but put it in your own words.

### EXPERIMENTAL DESIGN

### Explain how what you knew led you to your experimental design. Explain your assumptions and reasoning but *not* the details of your steps. Specifically describe the factors that are to be controlled. Describe what you will watch, measure and use as your criterion. Describe independent and dependent variables. Identify control variables and generally how they will be kept constant. Determine if a control case with the IV absent is appropriate for your experiment.

### HYPOTHESIS

* If there was a shift of questions discussed above, your hypothesis is to speak to the hypothesis that goes only with your final question. Conclude your discussion of the hypothesis with a *conditional statement* of your working hypothesis (“If…, then…” statement relating independent and dependent variables) For some experimental designs you may have more than one hypothesis. If so, number them.

## MATERIALS

* List all materials *(not in* sentence format) Be specific, especially for materials or equipment that is not commonly available.

### PROCEDURES

* Describe the steps that you took as a set of numbered *statements.* Explain adjustments that you made and the conditions that prompted these adjustments. Make your description sufficiently clear that anyone could repeat your experiment and get the same or similar results that you got.
* Be certain to include quantities, dimensions, and other measurements that would be helpful to a person trying to repeat your results.
* Procedural steps should be numbered and make use of an *economy of words.*
* Note any safety concerns.
* Specifically describe the factors that needed to be controlled including how control was achieved. What factors did you monitor? If this is well covered in your hypothesis or background, do not repeat yourself.
* Draw a *diagram* of the experimental *plan* and refer to the diagram in your description.

### RESULTS

* Consists of 2 parts: (label & write each individually)
  1. *Data Collection & Presentation:*
     + Data collected may be quantitative or qualitative
     + Express the raw data by using a *data chart.* Be careful to report only what was observed (even if unexpected), expressing the observation in measurable terms.
     + Data tables should be properly formatted with title, labels on columns and rows, and units.
     + Record uncertainties in your measurements
     + Attach raw data to end of report (state that there is an attachment in your report)

## *(b) Data Processing & Presentation:*

## Show the transformations of this raw data that you used to bring meaning to your observations.

## To assist you in your interpretation, you may want to process your data by finding averages, % changes, rates, ranges, or medians or modes to see if any patterns pop out.

## If the data can be expressed in the form of a graph, do so. Diagrams may be used. All graphs, tables, etc. should be clearly labeled (axes, title, units), points should be clearly plotted; graphs may be neatly hand drawn on graph paper, but I highly recommend you do them on Excel

## Calculations and other transformations should be placed in your paper in an easy to follow manner *according to the style requirements of the transformations* you have chosen. Show at least one sample calculation of each type

* Perform error analysis to assess the uncertainty present for your results.
* Make comparisons, note trends

### CONCLUSIONS

* Discuss how your results answer the question *in terms of your hypothesis.*
* Discuss sources of error and the limitations of your conclusions. Resolve any alterations in the question or hypothesis sections. In this section you are evaluating your data and its interpretation. Write this section in *paragraph* form.
* Where applicable, compare experimentally determined results with literature value; note reference
* Where applicable, calculate % error

### EVALUATION

* Review and evaluate the procedures you used. Explain how the procedure was successful as well as how the procedures may have led to error. Suggest modifications to the design of the procedure that would have led to more reliable results and greater validity of conclusions. Write this section in *paragraph* form.

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