The following titles (in **bold**) should be used for your lab report and given in this order within your lab report.

Design/Exploration

Background	The background information provided for the investigation is entirely appropriate and relevant and enhances the understanding of the context of the investigation. This paragraph should include cited research.	
Research Question	The topic of the investigation is identified and a relevant and has a fully focused measurable research question. This drives the research and ultimately you will reach a conclusion based upon your results. This should include your dependent and independent variables.	0 1 2
Hypothesis	State first & then give a logical, scientific rationale – your conclusion will also address the hypothesis you are giving.	
Variables	List Independent, Dependent, & Relevant Controlled Variables (no boxes or "aspects" please)	
Method for Controlling Variables –	The procedure has as an explanation for how variables are controlled as well as the values for parts being controlled.	0 1 2
Procedure/ Method for Collecting Data	The methodology of the investigation is highly appropriate to address the research question because it takes into consideration all, or nearly all, of the significant factors that may influence the relevance, reliability and sufficiency of the collected data. Written either in paragraph form, passive voice, and past tense or in a numbered format. This should be clearly understood using experimental values being tested. The procedure is a method for the collection of data. Explaining what you will do with the data, and how this will demonstrate possible significance, once collected is also considered to be helpful (	0 1 2

Procedure/Method Diagram/Photo – *If applicable and appropriate*, a labeled diagram or photo of the lab set-up is expected.

Data Collection and Processing/ Analysis

Data Collection	The report includes sufficient relevant quantitative and qualitative raw data that could support a detailed and valid conclusion to the research question. *Sufficient* in quantity and quality, raw *relevant* data must be gathered.	0 1 2
Data Processing	Appropriate and sufficient data processing is carried out with the accuracy required to enable a conclusion to the research question to be drawn that is fully consistent with the experimental data. Raw data is processed (calculated) for meaningful and useful interpretation. Data needs to be carefully vetted and outliers excluded from calculations.	0 1 2
Data Presentation	The processed data is correctly interpreted so that a completely valid and detailed conclusion to the research question can be deduced. All collected and processed data must be displayed properly. A *descriptive title, headings, units and uncertainties are mandatory* for every table, chart and graph. Data tables must fit on one page. If you absolutely have to split a table (due to quantity of data), make sure that you re - do the title and all column headings on the next page. All processing must show <u>one</u> example of each different type of manipulation that was carried out. Demonstrating errors and uncertainties in your data is mandatory.	0 1 2

Conclusion & Evaluation / Evaluation

Conclusion	This is a paragraph section in which you get a chance to discuss the results of your experiment. A detailed conclusion is described and justified which is entirely relevant to the research question and fully supported by the data presented. A conclusion is correctly described and justified through relevant comparison to the accepted scientific context. Using the data to support your argument, answer the research question that you have proposed and follow up with addressing whether your data seems to support or refute your hypothesis. This should be *discussed* and not just stated. *Specifically* refer to your graphs to give support to this discussion. Discussion refers to looking at data from various viewpoints, not just those that might support or refute your hypothesis. This is also a place to use outside resources (with proper citation) that give known or accepted values that might (or might not) align with your findings.	0 1 2
Limitations of Experimental Design	This paragraph *discusses* how well your experimental design helped answer your experimental question. Strengths and weaknesses of the investigation, such as *limitations of the data and sources of error*, are discussed and provide evidence of a clear understanding of the methodological issues involved in establishing the conclusion. What did and did not work well (and why)? This is also a section in which outlier points, if any, should be discussed, as well as possible reasons for those outlier points. If you did any statistical tests, what did the results of that test show? Simple explanations of poor judgment in measuring, inability to calculate, ineffective use of time are inappropriate. Instead, focus more on how the procedure may have made errors more likely.	0 1 2
Suggestions for Improvement	This paragraph gives reference to the limitations given in the previous subsection, discuss what realistic, relevant, specific and *useful* improvements could be made if you were to do this investigation again. Explain how this information is relevant, useful and what further experimentation could be done to increase our understanding of this specific topic.	0 1 2

Citations – All work should have some prior research completed (1)

Communication – 2

This portion is an overall score. It is dependent on structure and focus of the written lab. Your overall formatting and ability to craft a thoughtful report are taken into account.

Communication and engagement	The evidence of personal engagement with the exploration is clear with significant independent thinking, initiative or creativity. The justification given for choosing the research question and/or the topic under investigation demonstrates personal significance, interest or curiosity. There is evidence of personal input and initiative in the designing, implementation or presentation of the investigation.	0 1 2

(1) http://www.nature.com/scitable/ebooks/english-communication-for scientists 14053993/118519636#headerAndCitation