# Science Writing Heuristic

<table>
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<th>SECTION</th>
<th>DETAILS</th>
<th>PTS</th>
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| **Research Question**    | **What questions(s) did I have?**  
4 pts The student provided their own relevant research question(s) as well as cited sources.  
2 pts The student provided their own research question(s) and did not cite sources.  
0 pts The student provided no research question(s) or cited sources.                                                                                       | 4   |
| **Experimental Design**  | **What variable am I going to selectively manipulate (independent variable)?**  
3 pts What variable am I going to selectively manipulate (independent variable)?  
2 pts What variable (s) am I going to measure (dependent variable)?  
3 pts What variable(s) need to be held constant in case they too cause changes in the dependent variable (constants)?  
3 pts What will be my standard of comparison? Is there a scientific Standard? (Control)                                                                                       | 12  |
| **Safety Considerations**| **What general point(s) can I make about staying safe in this experiment? Look up Material Safety Data Sheet (MSDS sheet) - what are the specific safety concerns for the chemical?**  
4 pts The student provided both relevant general safety statements as well as a more specific concern about substances and procedures.  
2 pts The student provided either general safety concerns or a specific concern, but not both.  
0 pts The student provided no discussion about safety concerns or made a statement that was not relevant.                                                                                       | 4   |
| **Procedures**           | **What is the procedure needed in order to perform this experiment?**  
9 pts The procedure is complete, logical, and the instructor can read and follow it. Diagram of experimental setup (s) with picture (s) and label (s). Suitable Lab Materials are listed.  
6 pts Steps of the procedure are missing but the instructor can still make as sense of it. Diagram of experimental setup (s) with picture (s) and no label (s).  
3 pts The procedure does not make sense as written.  
0 pts The procedure is missing. No Diagram                                                                                                                      | 9   |
| **Data Collection & Presentation** | **What qualitative observations did I make? What quantitative raw data have I collected, and how have I processed (calculations) my data?**  
TYPICAL POINT VALUES (up to 35 points):  
12 pts Qualitative/Quantitative data  
4 pts Sample Calculations (no work, no credit)  
4 pts Uncertainty  
2 pts Graph or Table title (detailed description, not just “y vs. x”)  
5 pts Graphs (spread out data!) Full page or Table (neat & organized)  
8 pts Graph or Table with labels & units                                                                                                                     | 35  |
| **Conclusion & Evaluation** | **Claims-What can I claim to answer my research question(s)?**  
8 pts The student provided their own relevant claim to answer the research question.  
4 pts The student does not provide a relevant claim to answer the research question(s).  
0 pts The student provides no claim at all.  

**Evidence-What is my interpretation of my data (graphs, class data, trends, or other analysis) to support my claim(s)? Why did we see the observations that we did in the lab? What did those observations mean? Have I connected the proper evidence with the proper claim?**  
12 pts The student does an excellent job of providing their own relevant interpretation of the data (graphs, class data, trends or other analysis) to support the claim(s) and connected the proper evidence with the proper claim.  
6 pts The student does an proficient job of providing their own relevant interpretation of the data (graphs, class data, trends or other analysis) to support the claim(s) and connected the proper evidence with the proper claim OR does not compare experimental values to accepted values.  
3 pts The student does a poor job of providing their own relevant interpretation of the data (graphs, class data, trends or other analysis) to support the claim(s) and connected the proper evidence with the proper claim.  
0 pts The student provides no interpretation of the data.                                                                                      | 36  |
| **Reflection-Use complete sentences to address the following:** |  
- **What are at least two sources of error, weakness, or limitations in the lab design?** This refers to those aspects that would require a redesign of the lab, rather than simply redoing the lab. Unclean glassware and wrong calculations DO NOT count! Must include at least two. (8pts)  
- **How might I improve the lab design to account for the issues addressed above?** Consider better procedures and/or equipment that would enhance the accuracy and precision. (8pts)                                                                                           |     |

**SCORE**