

# Science Writing Heuristic

SECTION	DETAILS	PTS
<b>Research Question</b>	<p><i>What questions(s) did I have?</i></p> <p><b>4 pts</b> The student provided their own relevant research question(s) as well as cited sources.  <b>2pts</b> The student provided their own research question(s) and did not cite sources.  <b>0 pts.</b> The student provided no research question(s) or cited sources.</p>	/4
<b>Experimental Design</b>	<p><b>3 pts</b> What variable am I going to selectively manipulate (independent variable)?  <b>3 pts</b> What variable (s) am I going to measure (dependent variable)?  <b>3 pts</b> What variable(s) need to be held constant in case they too cause changes in the dependent variable (constants)?  <b>3pts</b> What will be my standard of comparison? Is there a scientific Standard? (Control)</p>	/12
<b>Safety Considerations</b>	<p><i>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?</i></p> <p><b>4pts</b> The student provided both relevant <b>general</b> safety statements as well as a more <b>specific</b> concern about substances and procedures.  <b>2pts</b> The student provided <b>either</b> general safety concerns or a specific concern, but not both.  <b>0 pts</b> The student provided <b>no</b> discussion about safety concerns or made a statement that was not relevant.</p>	/4
<b>Procedures</b>	<p><i>What is the procedure needed in order to perform this experiment?</i></p> <p><b>9 pts</b> 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.  <b>6 pts</b> 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).  <b>3 pts</b> The procedure does not make sense as written.  <b>0 pts</b> The procedure is missing. No Diagram</p>	/9
<b>Data Collection &amp; Presentation</b>	<p><i>What qualitative observations did I make? What quantitative raw data have I collected, and how have I processed (calculations) my data?</i></p> <p><b>TYPICAL POINT VALUES (up to 35 points):</b></p> <p><b>12 pts</b> Qualitative/Quantitative data  <b>4 pts</b> Sample Calculations (no work, no credit)  <b>4 pts</b> Uncertainty  <b>2 pts</b> Graph or Table title (<b>detailed description</b>, not just “y vs. x”)  <b>5 pts</b> Graphs (spread out data!) Full page or Table (neat &amp; organized)  <b>8 pts</b> Graph or Table with labels &amp; units</p>	/35
<p><b>Conclusion &amp; Evaluation</b></p> <p><b>NOTE:</b> This section involves <b>interpretation and evaluation</b> of data, <b>NOT summary and reiteration!</b></p>	<p><i>Claims-What can I claim to answer my research question(s)?</i></p> <p><b>8 pts</b> The student provided their own relevant claim to answer the research question.  <b>4 pts</b> The student does not provide a relevant claim to answer the research question(s).  <b>0 pts</b> The student provides no claim at all.</p> <p><i>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?</i></p> <p><b>12 pts.</b> 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.  <b>6 pts.</b> 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 <b>OR</b> does not compare experimental values to accepted values  <b>3 pts.</b> 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  <b>0 pts</b> The student provides no interpretation of the data</p> <p><i>Reflection-Use complete sentences to address the following:</i></p> <ul style="list-style-type: none"> <li><b>What are at least two sources of error, weakness, or limitations in the lab design?</b> This refers to those aspects that would require a <b>redesign</b> of the lab, rather than simply <b>redoing</b> the lab. Unclean glassware and wrong calculations <b>DO NOT</b> count! Must include at least two. <b>(8pts)</b></li> <li><b>How might I improve the lab design to account for the issues addressed above?</b> Consider better procedures and/or equipment that would enhance the accuracy and precision. <b>(8pts)</b></li> </ul>	/36

SCORE