

## ***Investigation Written Report Rubrics***



Each part of your investigation is an important part. Background research / literature review, designing experiments, conducting experiments and collecting data, analyzing the data and drawing conclusions, and finally communicating the results and findings of an investigation are all pieces of what science is really about. Each part is necessary to help add to what we know about our world.

Each part of your investigation will be assessed individually. You will be turning in your ***final copies*** of your investigations one at a time over the next several weeks. Each part of the investigation will receive at least one grade. Some parts will be assessed for two different things:

- The ***materials list, procedure, charts, graphs, and data analysis*** will be assessed for ***CONTENT*** and ***USE OF METRICS***.
- All ***written portions*** will be assessed for ***SPELLING*** and ***GRAMMAR***.

The completed written copy of all parts of your investigation will be assessed as a separate assignment.

The rubrics you have been given will show you the criteria for assessment and help guide you in constructing your final product.

	<b>Novice 70 Points</b>	<b>Emergent 80 Points</b>	<b>Skilled 90 Points</b>	<b>Expert 100 Points</b>
<b>Background information – Literature Review</b>	<ul style="list-style-type: none"> <li>❑ Information is incomplete.</li> <li>❑ Basics of the topic are not included.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Information includes the basics of the topic.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Information includes the basics of the topic and is developed into an in-depth study.</li> <li>❑ History of the topic and contributions of appropriate scientists are included.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Information includes an in-depth study.</li> <li>❑ Shows evidence of extensive research.</li> <li>❑ History of the topic and contributions of appropriate scientists are included.</li> <li>❑ Diagrams / pictures are included.</li> </ul>
<b>Question or Problem</b>	<ul style="list-style-type: none"> <li>❑ Question / problem is unclear.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Answer to question / problem is common knowledge.</li> <li>❑ Question / problem has little relevance.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Question / problem is precisely worded.</li> <li>❑ Independent and dependent variables can be identified.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Question / problem is precisely worded.</li> <li>❑ Independent and dependent variables can be identified.</li> <li>❑ Question is related to a real issue.</li> </ul>

	<b>Novice 70 Points</b>	<b>Emergent 80 Points</b>	<b>Skilled 90 Points</b>	<b>Expert 100 Points</b>
<b>Purpose</b>	<ul style="list-style-type: none"> <li>□ Purpose is unclear.</li> </ul>	<ul style="list-style-type: none"> <li>□ Purpose is clear, but unrelated to a real issue.</li> </ul>	<ul style="list-style-type: none"> <li>□ Purpose is related to a real issue, but the reason for doing the investigation is unclear.</li> </ul>	<ul style="list-style-type: none"> <li>□ Purpose is clearly related to a real issue.</li> <li>□ The reason for the investigation is clear.</li> </ul>

	<b>Novice 70 Points</b>	<b>Emergent 80 Points</b>	<b>Skilled 90 Points</b>	<b>Expert 100 Points</b>
<b>Hypothesis</b>	<ul style="list-style-type: none"> <li>❑ No or poor relationship between the question / problem and the predicted results.</li> <li>❑ No evidence of the use of research to form the hypothesis.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Hypothesis shows reasonable relationship between the question / problem and predicted results.</li> <li>❑ No evidence to support the hypothesis.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Hypothesis is clearly based on and supported by research.</li> <li>❑ It is stated in testable form (independent and dependent variables are clear).</li> </ul>	<ul style="list-style-type: none"> <li>❑ Hypothesis is clearly based on and supported by research.</li> <li>❑ It is stated in testable form (independent and dependent variables are clear).</li> <li>❑ Includes a detailed explanation of the evidence used to form the hypothesis.</li> </ul>

	<b>Novice 70 Points</b>	<b>Emergent 80 Points</b>	<b>Skilled 90 Points</b>	<b>Expert 100 Points</b>
<b>Materials List</b>	<ul style="list-style-type: none"> <li>❑ Some materials are listed.</li> <li>❑ Not in list form</li> <li>❑ Details are missing about equipment.</li> </ul>	<ul style="list-style-type: none"> <li>❑ All materials are listed, but in incorrect form.</li> <li>❑ Details are missing about equipment.</li> </ul>	<ul style="list-style-type: none"> <li>❑ List is complete and in list form.</li> <li>❑ Details (types, brands, and models numbers) about equipment are included.</li> </ul>	<ul style="list-style-type: none"> <li>❑ List is complete and in correct form.</li> <li>❑ Details (types, brands, and models numbers) about equipment are included.</li> <li>❑ Sources for materials are included.</li> </ul>

	<b>Novice 70 Points</b>	<b>Emergent 80 Points</b>	<b>Skilled 90 Points</b>	<b>Expert 100 Points</b>
<b>Experimental Design – Procedure</b>	<ul style="list-style-type: none"> <li>❑ Design is not related to the hypothesis.</li> <li>❑ Steps show a significant lack of detail.</li> <li>❑ Steps are not sequential.</li> <li>❑ Steps are missing.</li> <li>❑ Experiment could not be repeated.</li> <li>❑ Safety considerations are not mentioned.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Design has some relationship to hypothesis.</li> <li>❑ Steps are not clearly numbered.</li> <li>❑ Steps are not in a logical order.</li> <li>❑ Experiment could not be easily repeated.</li> <li>❑ Safety considerations are not mentioned.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Design is adequate to test hypothesis.</li> <li>❑ Steps are numbered.</li> <li>❑ Enough detail is given to repeat the experiment.</li> <li>❑ Safety considerations are addressed.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Design is a well-constructed test of the hypothesis.</li> <li>❑ Step-by-step details are given so that someone who has not seen the experiment could repeat the experiment.</li> <li>❑ Safety considerations are addressed and procedures are given to insure little or no risk to students.</li> </ul>

	<b>Novice 70 Points</b>	<b>Emergent 80 Points</b>	<b>Skilled 90 Points</b>	<b>Expert 100 Points</b>
<b>Drawing or Diagram</b>	<ul style="list-style-type: none"> <li>❑ Diagram / picture does not relate to actual experiment.</li> <li>❑ Objects in the diagram / picture are not recognizable.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Diagram / picture relates to the actual experiment.</li> <li>❑ Objects in the diagram / picture are recognizable.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Objects in the diagram / picture are recognizable and detailed.</li> <li>❑ Diagram / picture is clear and neat.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Objects in the diagram / picture are recognizable and detailed.</li> <li>❑ Diagram / picture is clear and neat.</li> <li>❑ All parts of the Diagram / picture are labeled.</li> </ul>
<b>Summary of Variables</b>	<ul style="list-style-type: none"> <li>❑ Most variables are missing or incorrect.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Some variables are missing or incorrect.</li> </ul>	<ul style="list-style-type: none"> <li>❑ All variables are listed and correct.</li> <li>❑ Levels of the independent variable are defined.</li> </ul>	<ul style="list-style-type: none"> <li>❑ All variables are listed and correct.</li> <li>❑ Levels of the independent variable are defined.</li> <li>❑ All possible controlled variables are listed.</li> </ul>



	<b>Novice 70 Points</b>	<b>Emergent 80 Points</b>	<b>Skilled 90 Points</b>	<b>Expert 100 Points</b>
<b>Data Collection -Chart</b>	<ul style="list-style-type: none"> <li>❑ Data missing or inaccurate.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Chart is incomplete or contains inconsistent data.</li> <li>❑ Shows a minimum of five trials.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Charts are clearly labeled and in column or row form.</li> <li>❑ Headings in chart show measurement units.</li> <li>❑ Shows a minimum of five trials.</li> <li>❑ Calculations, when required, are shown.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Charts are clearly labeled and in column or row form.</li> <li>❑ Headings in chart show measurement units.</li> <li>❑ Includes qualitative (descriptive) as well as quantitative (numerical) data.</li> <li>❑ Calculations, when required, are shown.</li> <li>❑ More than five trials were done.</li> </ul>

	<b>Novice 70 Points</b>	<b>Emergent 80 Points</b>	<b>Skilled 90 Points</b>	<b>Expert 100 Points</b>
<b>Data Display -Graph(s)</b>	<ul style="list-style-type: none"> <li>❑ Inappropriate graph for the type of data collected.</li> <li>❑ Data points missing.</li> <li>❑ Inappropriate labels.</li> <li>❑ Inappropriate intervals.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Appropriate graph for type of data collected.</li> <li>❑ All data points included, some inaccurately plotted.</li> <li>❑ Correctly labeled.</li> <li>❑ Inappropriate intervals.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Appropriate graph for type of data collected.</li> <li>❑ Multiple graphs used if needed.</li> <li>❑ All data points accurately plotted.</li> <li>❑ Appropriate intervals.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Appropriate graph for type of data collected.</li> <li>❑ Multiple graphs used if needed.</li> <li>❑ All data points accurately plotted.</li> <li>❑ Appropriate intervals.</li> <li>❑ Visually compelling, shows conclusions of investigation.</li> </ul>

	<b>Novice 70 Points</b>	<b>Emergent 80 Points</b>	<b>Skilled 90 Points</b>	<b>Expert 100 Points</b>
<b>Data Analysis</b>	<ul style="list-style-type: none"> <li>❑ A written description of some of the data is given.</li> </ul>	<ul style="list-style-type: none"> <li>❑ A written description of the data is given.</li> <li>❑ Some of the data is discussed in terms of its significance.</li> </ul>	<ul style="list-style-type: none"> <li>❑ A written description of the data is given.</li> <li>❑ Most of the data is discussed in terms of its significance.</li> <li>❑ Relationships between and among data are identified.</li> <li>❑ The accuracy &amp; precision of the data is discussed.</li> <li>❑ Appropriate statistics (mean, median, mode, range, frequencies) are used.</li> </ul>	<ul style="list-style-type: none"> <li>❑ A written description of the data is given.</li> <li>❑ All of the data is discussed in terms of its significance.</li> <li>❑ Relationships between and among data are identified &amp; discussed.</li> <li>❑ The accuracy &amp; precision of the data is discussed.</li> <li>❑ Limitations of the data are pointed out &amp; discussed.</li> <li>❑ Appropriate statistics (mean, median, mode, range, frequencies) are used.</li> </ul>

	<b>Novice 70 Points</b>	<b>Emergent 80 Points</b>	<b>Skilled 90 Points</b>	<b>Expert 100 Points</b>
<b>Conclusion</b>	<ul style="list-style-type: none"> <li>❑ Conclusion is not supported by the data.</li> <li>❑ Relationships are inaccurate or missing.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Conclusion is too general or over-reaches the data analysis.</li> <li>❑ Conclusion is not related to original hypothesis.</li> <li>❑ Some statements are supported by the data.</li> <li>❑ Relationships are inaccurate or missing.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Conclusion is related to original hypothesis.</li> <li>❑ All statements are supported by the data.</li> <li>❑ All statements refer to specific data.</li> <li>❑ Relationships are identified and supported by the evidence.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Conclusion relates directly to the support or non-support of hypothesis.</li> <li>❑ All statements are supported by the data.</li> <li>❑ All statements refer to specific data.</li> <li>❑ Relationships are clearly identified and supported by the evidence.</li> <li>❑ Relationships focus on the original question / problem and are connected to the “big Picture” of the investigation.</li> </ul>

	<b>Novice 70 Points</b>	<b>Emergent 80 Points</b>	<b>Skilled 90 Points</b>	<b>Expert 100 Points</b>
<b>Expansion</b>	<ul style="list-style-type: none"> <li>❑ Ideas suggested for future study are irrelevant.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Suggestions for improvement of investigation are identified.</li> <li>❑ Ideas suggested for future study are irrelevant.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Suggestions for improvement of investigation are identified.</li> <li>❑ One or two relevant ideas for future study are suggested.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Suggestions for improvement of investigation are identified.</li> <li>❑ Many relevant ideas for future study are suggested.</li> </ul>
<b>Application</b>	<ul style="list-style-type: none"> <li>❑ Applications are not related to the conclusion.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Applications are related to the conclusion, but are vague or general.</li> </ul>	<ul style="list-style-type: none"> <li>❑ One or two applications are described.</li> <li>❑ General applications are directly related to the conclusions.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Several applications are described.</li> <li>❑ Specific applications are directly related to the conclusions.</li> </ul>

	<b>Novice 70 Points</b>	<b>Emergent 80 Points</b>	<b>Skilled 90 Points</b>	<b>Expert 100 Points</b>
<b>Abstract</b>	<ul style="list-style-type: none"> <li>❑ Abstract is incomplete and unorganized.</li> <li>❑ Topics are not defined.</li> <li>❑ Details are missing.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Abstract is complete, but unorganized.</li> <li>❑ Topics are not developed.</li> <li>❑ Few or irrelevant details.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Abstract is complete.</li> <li>❑ Topics are defined, but not completely developed.</li> <li>❑ Details may be relevant but are limited, or too general.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Abstract is complete.</li> <li>❑ Topics are defined and fully developed.</li> <li>❑ Details are relevant, develop the topic, and provide important information.</li> <li>❑ Ideas &amp; details are connected to the topic.</li> <li>❑ Topic is developed in a logical, sequential way.</li> </ul>
<b>Works Cited</b>	<ul style="list-style-type: none"> <li>❑ Less than three sources.</li> <li>❑ Incorrect form.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Includes three sources, but lacks electronic source or uses more than one encyclopedia.</li> <li>❑ Incorrect form.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Uses three appropriate sources.</li> <li>❑ Uses correct form.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Uses more than three appropriate sources.</li> <li>❑ Uses correct form.</li> </ul>

	<b>Novice 70 Points</b>	<b>Emergent 80 Points</b>	<b>Skilled 90 Points</b>	<b>Expert 100 Points</b>
<b>Use of metric Measurement</b>	<ul style="list-style-type: none"> <li>❑ Metric measurement not used.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Metric measurement used incorrectly and inconsistently.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Metric measurement is used correctly and consistently.</li> </ul>	<ul style="list-style-type: none"> <li>❑ Metric measurement is used correctly and consistently.</li> <li>❑ Measurement is precise.</li> </ul>
<b>Spelling &amp; Grammar</b>	<ul style="list-style-type: none"> <li>❑ Frequent spelling and / or grammar errors.</li> </ul>	<ul style="list-style-type: none"> <li>❑ More than two spelling and / or grammar errors.</li> </ul>	<ul style="list-style-type: none"> <li>❑ One or two spelling and / or grammar errors.</li> </ul>	<ul style="list-style-type: none"> <li>❑ No spelling and / or grammar errors.</li> </ul>

<b>Final Written Report of Investigation</b>					
	<b>Novice 2 Points</b>	<b>Emergent 3 Points</b>	<b>Skilled 4 Points</b>	<b>Expert 5 Points</b>	<b>Points Earned</b>
	*Incomplete *Sloppy work *Many errors	*Complete *More than two errors	*Complete & neat *One or two errors	*Complete & neat *No obvious errors	
<b>Cover Sheet</b>					
<b>Question / Problem / Purpose</b>					
<b>Table of Contents</b>					
<b>Abstract</b>					
<b>Background Information / Literature Review</b>					
<b>Hypothesis</b>					
<b>Materials List</b>					
<b>Procedure (Step-by-step Instructions)</b>					
<b>Procedure (Diagram or Picture)</b>					
<b>Procedure (Summary of Variables)</b>					
<b>Data Collection (Charts)</b>					
<b>Data Display (Graphs)</b>					
<b>Data Analysis</b>					
<b>Conclusion/Data</b>					
<b>Conclusion/Expansion</b>					
<b>Conclusion/Application</b>					
<b>Works Cited</b>					
<b>Report in Order</b>					
<b>Neatness</b>					
<b>General Instructions</b>					
<b>Point Totals</b>					



