Assessments by students must follow MLA Format (12 Pt, calibra, double spaced)

1. Task: Investigate the relationship between the length and the resistance of a wire. You are expected to write the exploration part (criteria B) and the analysis (criteria C) part of the scientific inquiry format. Both reports are done individually but the experiment is done in groups. Additional note: for the achievement level 7-8 you are expected to briefly explain electrical resistivity in the background section as well as determine the resistivity for your wire.

2. Rubric

<table>
<thead>
<tr>
<th>Achievement level</th>
<th>Criteria B &amp; C Clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-8 excellent</td>
<td>I have:</td>
</tr>
<tr>
<td></td>
<td>- given a detailed account of a <strong>problem</strong>, using the scientific facts and sources, how it is related to the topic, including all the <strong>variables</strong>.</td>
</tr>
<tr>
<td></td>
<td>- formulated a testable <strong>hypothesis</strong> providing details about the <strong>variables</strong> using words like ‘increase, decrease, no change’ and supported it clearly using <strong>correct</strong> scientific reasoning using ‘because’.</td>
</tr>
<tr>
<td></td>
<td>- given a detailed account of how to manipulate, control and measure IV, DV and all <strong>controlled</strong> variables and collect sufficient relevant data</td>
</tr>
<tr>
<td></td>
<td>- designed a safe, complete and <strong>logical</strong> method that is easy to follow and contains <strong>every</strong> <strong>material</strong> used and include all quantities.</td>
</tr>
</tbody>
</table>

| 7-8 excellent     | I have:                        |
|                   |   - correctly organized data using tables including correct titles, headers and units; data has been processed showing worked examples and displayed appropriately using correct labels and units |
|                   |   - correctly used knowledge and understanding of science to recognize patterns, draw conclusions and correctly given an account of how and why the variables are related |
|                   |   - evaluated whether the data supports the hypothesis based on the data collected considering many possibilities and used scientific reasons and sources to explain |
|                   |   - evaluated the method considering the strengths, limitations and the reliability and addressed the significance |
|                   |   - provided a detailed account to explain improvements to specific limitations and further work that are realistic and based on scientific reasoning and research |

3. Description of Command words. (Insert the command terms that are used in the clarifications)

<table>
<thead>
<tr>
<th>Command</th>
<th>Clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Describe</strong></td>
<td>Give a detailed account or picture of a situation, event, pattern or process.</td>
</tr>
<tr>
<td><strong>Design</strong></td>
<td>Produce a plan, simulation or model.</td>
</tr>
<tr>
<td><strong>Discuss</strong></td>
<td>Offer a considered and balanced review that includes a range of arguments, factors or hypothesis. Opinions or conclusions should be presented clearly and supported by appropriate evidence.</td>
</tr>
<tr>
<td><strong>Evaluate</strong></td>
<td>Make an appraisal by weighing up the strengths and limitations</td>
</tr>
<tr>
<td><strong>Explain</strong></td>
<td>Give a detailed account including reasons and causes. (See also “Justify”.)</td>
</tr>
<tr>
<td><strong>Formulate</strong></td>
<td>Express precisely and systematically the relevant concept(s) or argument(s).</td>
</tr>
<tr>
<td><strong>Interpret</strong></td>
<td>Use knowledge and understanding to recognize trends and draw conclusions from given information.</td>
</tr>
<tr>
<td><strong>Outline</strong></td>
<td>Give a brief account or summary.</td>
</tr>
<tr>
<td><strong>Present</strong></td>
<td>Offer for display, observation, examination or consideration.</td>
</tr>
<tr>
<td><strong>State</strong></td>
<td>Give a specific name, value or other brief answer without explanation or calculation.</td>
</tr>
<tr>
<td><strong>Summarize</strong></td>
<td>Abstract a general theme or major point(s).</td>
</tr>
</tbody>
</table>

4. Complete Rubric (on the backside)
<table>
<thead>
<tr>
<th>B Level</th>
<th>Level descriptor</th>
<th>Task-specific clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>The student does not reach a standard described by any of the descriptors given below</td>
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</table>
| 1-2     | The student is able to:  
- state a problem or question to be tested by a scientific investigation  
- outline a testable hypothesis  
- outline the variables  
- Design a method, with limited success | I have:  
- identified and stated a problem or research question to be tested  
- outlined a testable hypothesis  
- given brief details on the variables  
- written a method for my lab |
| 3-4     | The student is able to:  
- outline a problem or question to be tested by a scientific investigation  
- formulate a testable hypothesis using scientific reasoning  
- outline how to manipulate the variables, and outline how relevant data will be collected  
- design a safe method in which he or she selects materials and equipment | I have:  
- given brief details on how my problem is connected to the topic and stated the problem as a research question  
- formulated a testable hypothesis which includes the variables  
- given brief details on how to change the IV, measure DV and control other variables  
- designed a safe method and selected the materials needed. |
| 5-6     | The student is able to:  
- describe a problem or question to be tested by a scientific investigation  
- formulate and explain a testable hypothesis using scientific reasoning  
- describe how to manipulate the variables, and describe how sufficient, relevant data will be collected  
- design a complete safe method in which he or she selects appropriate materials and equipment | I have:  
- provided details about a problem, how it is connected to the topic and stated the research question that contains the variables  
- formulated a testable hypothesis providing details about the variables using words like ‘increase, decrease, no change’ and supported it clearly using scientific reasoning using ‘because’  
- provided details on how to manipulate, control and measure the IV, DV and controlled variables and collect sufficient relevant data  
- designed a safe and complete method that is easy to follow and contains every material used and include all quantities. |
| 7-8     | The student is able to:  
- explain a problem or question to be tested by a scientific investigation  
- formulate and explain a testable hypothesis using correct scientific reasoning  
- explain how to manipulate the variables, and explain how sufficient, relevant data will be collected  
- design a logical, complete safe method in which he or she selects appropriate materials and equipment | I have:  
- given a detailed account of a problem, using the scientific facts and sources, how it is related to the topic, including all the variables.  
- formulated a testable hypothesis providing details about the variables using words like ‘increase, decrease, no change’ and supported it clearly using correct scientific reasoning using ‘because’  
- given a detailed account of how to manipulate, control and measure IV, DV and all controlled variables and collect sufficient relevant data  
- designed a safe, complete and logical method that is easy to follow and contains every material used and include all quantities. |
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| 1-2   | The student is able to:  
- collect and present data in numerical and/or visual forms  
- interpret data  
- state the validity of a hypothesis based on the outcome of a scientific investigation  
- state the validity of the method based on the outcome of a scientific investigation  
- state improvements or extensions to the method. | I have:  
- collected and presented the data collected using simple tables or graphs  
- used knowledge and understanding of science to recognise patterns and draw conclusions  
- stated whether the data supports the hypothesis  
- listed errors in the design and procedure  
- stated improvements to the limitations of the method. |
| 3-4   | The student is able to:  
- correctly collect and present data in numerical and/or visual forms  
- accurately interpret data and explain results  
- outline the validity of a hypothesis based on the outcome of a scientific investigation  
- outline the validity of the method based on the outcome of a scientific investigation  
- outline improvements or extensions to the method that would benefit the scientific investigation. | I have:  
- collected and presented the data collected using simple tables or graphs including titles, labels and units  
- used knowledge and understanding of science to recognise patterns, draw conclusions and given an account of how and why the variables are related  
- given brief details on whether the data supports the hypothesis based on the data collected  
- given brief details of errors in the design and procedure  
- given brief details of the improvements to the limitations of the method. |
| 5-6   | The student is able to:  
- correctly collect, organize and present data in numerical and/or visual forms  
- accurately interpret data and explain results using scientific reasoning  
- discuss the validity of a hypothesis based on the outcome of a scientific investigation  
- discuss the validity of the method based on the outcome of a scientific investigation  
- describe improvements or extensions to the method that would benefit the scientific investigation. | I have:  
- organized collected data using tables with headers and units, appropriate graphs including correct titles, axis labels and units  
- correctly used knowledge and understanding of science to recognise patterns, draw conclusions and given an account of how and why the variables are related  
- discussed whether the data supports the hypothesis based on the data collected based on the outcome of the experiment  
- discussed the method considering the strengths, limitations and the reliability  
- provided details of suggested improvements or further work that are realistic |
| 7-8   | The student is able to:  
- correctly collect, organize, transform and present data in numerical and/or visual forms  
- accurately interpret data and explain results using correct scientific reasoning  
- evaluate the validity of a hypothesis based on the outcome of a scientific investigation  
- evaluate the validity of the method based on the outcome of a scientific investigation  
- explain improvements or extensions to the method that would benefit the scientific investigation. | I have:  
- correctly organized data using tables including correct titles, headers and units; data has been processed showing worked examples and displayed appropriately using correct labels and units  
- correctly used knowledge and understanding of science to recognise patterns, draw conclusions and correctly given an account of how and why the variables are related  
- evaluated whether the data supports the hypothesis based on the data collected considering many possibilities and used scientific reasons and sources to explain  
- evaluated the method considering the strengths, limitations and the reliability and addressed the significance  
- provided a detailed account to explain improvements to specific limitations and further work that are realistic and based on scientific reasoning and research |