

# Criterion C: Processing and evaluating

**Maximum: 8**

At the end of year 10, students should be able to:

- i. present collected and transformed data
- ii. interpret data and outline results using scientific reasoning
- iii. discuss the validity of a prediction based on the outcome of the scientific investigation
- iv. discuss the validity of the method
- v. describe improvements or extensions to the method.

| Level of Achievement | Level Descriptor  |
|----------------------|---|
| <b>0</b>             | The student does not reach the standard described in any of the levels below.   |
| <b>1-2</b>           | <p>The student is able to:</p> <p>i. <b>collect and present</b> data in numerical and/or visual forms</p> <p>ii. <b>interpret</b> data</p> <p>iii. <b>state</b> the validity of a prediction based on the outcome of a scientific investigation, <b>with limited success</b></p> <p>iv. <b>state</b> the validity of the method based on the outcome of a scientific investigation, <b>with limited success</b></p> <p>v. <b>state</b> improvements or extensions to the method that would benefit the scientific investigation, <b>with limited success</b>.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> The student records the data with errors or omissions.</li> <li><input type="checkbox"/> The student graphically represents the data with large errors or omissions.</li> <li><input type="checkbox"/> The calculations are not completely correct, or an example is not included.</li> <li><input type="checkbox"/> The student indicates the relationship/pattern shown by the data.</li> <li><input type="checkbox"/> The student draws a conclusion from the data.</li> <li><input type="checkbox"/> The student indicates the validity of the hypothesis based on their interpretation of the results.</li> <li><input type="checkbox"/> The student indicates the validity of the method based on their interpretation of the results.</li> <li><input type="checkbox"/> The student indicates an improvement or improvement to the method employed.</li> </ul>   |
| <b>3-4</b>           | <p>The student is able to:</p> <p>i. <b>correctly collect and present</b> data in numerical and/or visual forms</p> <p>ii. <b>accurately interpret</b> data and <b>outline</b> results</p> <p>iii. <b>state</b> the validity of a prediction based on the outcome of a scientific investigation</p> <p>iv. <b>state</b> the validity of the method based on the outcome of a scientific investigation</p> <p>v. <b>state</b> improvements or extensions to the method that would benefit the scientific investigation.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> The student records the data correctly in a partially table (titles columns with units and magnitudes) the raw data or processed data from the investigation.</li> <li><input type="checkbox"/> The student correctly graphically represents the results, (with title, labelled axes, correct scale, line of best fit) or has processed the raw data correctly.</li> <li><input type="checkbox"/> The necessary calculations are correct although there may be small errors of calculation or presentation.</li> <li><input type="checkbox"/> The student broadly speaking explains the tendency or pattern in the graph.</li> <li><input type="checkbox"/> The student draws a conclusion from the correct interpretation of the results.</li> <li><input type="checkbox"/> The student establishes in broad terms the validity of the hypothesis.</li> <li><input type="checkbox"/> The student establishes the validity of the method</li> <li><input type="checkbox"/> The student describes in broad terms a possible weakness or source of error for the method</li> <li><input type="checkbox"/> The student explains in broad terms an improvement for the weaknesses mentioned, or improvements to the method that would result in a better investigation.</li> </ul>   |
| <b>5-6</b>           | <p>The student is able to:</p> <p>i. <b>correctly collect, organize and present</b> data in numerical and/or visual forms</p> <p>ii. <b>accurately interpret</b> data and <b>outline</b> results <b>using scientific reasoning</b></p> <p>iii. <b>outline</b> the validity of a prediction based on the outcome of a scientific investigation</p> <p>iv. <b>outline</b> the validity of the method based on the outcome of a scientific investigation</p> <p>v. <b>outline</b> improvements or extensions to the method that would benefit the scientific</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> The student records the data correctly in a formatted table (titles columns with units and magnitudes) the raw data and processed data from the investigation.</li> <li><input type="checkbox"/> The student correctly graphically represents the results (with title, labelled axes, correct scale, line of best fit) or has processed the raw data correctly.</li> <li><input type="checkbox"/> The necessary calculations are correct and the student gives examples.</li> <li><input type="checkbox"/> The student scientifically explains the tendency or pattern in the graph.</li> <li><input type="checkbox"/> The student draws a conclusion from the correct interpretation of the results, the scientific explanation for this is present.</li> <li><input type="checkbox"/> The student establishes the validity of the hypothesis, basing their judgement on the correct interpretation of the results.</li> <li><input type="checkbox"/> The student establishes the validity of the method, basing judgements on the correct interpretation of the results.</li> <li><input type="checkbox"/> The student explains clearly two or more possible weaknesses or non-trivial sources of error due to the method.</li> <li><input type="checkbox"/> The student explains improvements for the weaknesses mentioned, and/or improvements to the method that would result in a better investigation</li> </ul> |

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|     | investigation.   |  |
| 7-8 | <p>The student is able to:</p> <p>i. <b>correctly collect, organize, transform and present</b> data in numerical and/ or visual forms</p> <p>ii. <b>accurately interpret data</b> and <b>outline results using correct scientific reasoning</b></p> <p>iii. <b>discuss</b> the validity of a prediction based on the outcome of a scientific investigation</p> <p>iv. <b>discuss</b> the validity of the method based on the outcome of a scientific investigation</p> <p>v. <b>describe</b> improvements or extensions to the method that would benefit the scientific investigation.</p> | <ul style="list-style-type: none"> <li><input type="checkbox"/> The student records the data correctly in a formatted table (titles columns with units and magnitudes) the raw data and processed data from the investigation.</li> <li><input type="checkbox"/> The student correctly graphically represents the results (with title, labelled axes, correct scale, line of best fit) or has processed the raw data correctly.</li> <li><input type="checkbox"/> The necessary calculations are correct and the student gives examples.</li> <li><input type="checkbox"/> The student scientifically explains the tendency/pattern in the graph.</li> <li><input type="checkbox"/> The student obtains a principal conclusion, based on the correct interpretation of the results.</li> <li><input type="checkbox"/> The conclusion is argued with commentaries about the precision and accuracy of the results, and if required the difference in expected and obtained results.</li> <li><input type="checkbox"/> The student establishes the validity of the hypothesis, weighing the implications, based on the correct interpretation of the results.</li> <li><input type="checkbox"/> The student establishes the validity of the method, weighing the implications and limitations (precision, accuracy) based on the correct interpretation of the results.</li> <li><input type="checkbox"/> The student explains clearly two or more possible weaknesses or non-trivial sources of error due to the method.</li> <li><input type="checkbox"/> The student explains detailed realistic improvements for each of the weaknesses mentioned, and/or improvements to the method that would result in a better investigation.</li> </ul> |