## Year 8 Science 20018-2019 Criterion B: Inquiring and designing

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| Level of Achievement |  | Level Descriptor |
| 0 | The student does not reach the standard described in any of the levels below. | |
| 1-2 | The student is able to:  i. **state** a problem or question to be tested by a scientific investigation  ii. **outline** a testable hypothesis  iii. **outline** the variables  iv. **design** a method, with limited success | The question or investigation problem is adequate, but poorly expressed. The hypothesis is formulated Variables have been identified. The **method** does not allow for the effective development of the investigation.  A reference list is not included. |
| 3-4 | The student is able to:  i. **outline** a problem or question to be tested by a scientific investigation  ii. **formulate** a testable hypothesis using scientific reasoning  iii. **outline** how to manipulate the variables, and outline how relevant data will be collected  iv. **design** a safe method in which he or she selects materials and equipment | The question or investigation problem is adequate. The hypothesis is formulated and justified with some scientific reasoning. Variables are correctly identified as independent, dependent, controls may be missing. The manipulation and measuring of all variables is present.  The method allows for the collection of relevant data. The **method** is safe.  A complete list of materials, is included. A reference list is included. |
| 5-6 | The student is able to:i. describe a problem or question to be tested by a scientific investigationii. formulate and explain a testable hypothesis using scientific reasoningiii. describe how to manipulate the variables, and describe how sufficient, relevant data will be collectediv. design a complete and safe method in which he or she selects appropriate materials and equipment | The question or investigation problem is explained in broad terms, using scientific vocabulary, based on some research. The hypothesis is well formulated, explained and theoretically justified with scientific reasoning. Variables are correctly identified as independent, dependent and controlled. The manipulation and measuring of all variables is present. The method allows for the collection of sufficient relevant data. The **method** is completely clear and safe.  A complete list of materials is included. A reference list is included in the APA format. |
| 7-8 | The student is able to:  i. **explain** a problem or question to be tested by a scientific investigation  ii. **formulate** and **explain** a testable hypothesis using correct scientific reasoning  iii. **explain** how to manipulate the variables, and explain how sufficient, relevant data will be collected  iv. **design** a logical, complete and safe method in which he or she selects appropriate materials and equipment. | The question or investigation problem is well detailed, using scientific vocabulary, based on research. The hypothesis is well formulated, explained and theoretically justified with correct scientific reasoning. Variables are correctly identified as independent, dependent and controlled. The manipulation and measuring of all variables is explained. The method allows for the collection of sufficient relevant data. The **method** is completely clear, safe and logically structured.  A complete list of materials, with their proper names, is included. A reference list is included in the APA format. |

**Task**: Design an investigation into a factor that affects the speed of a chemical reaction.

You can choose from one of the following reactions:

* Potassium permanganate and glucose
* Acid and metal reaction (Mg + HCl)
* Effervescent tablet in water

**Note**: For this formative assessment you will need to complete the following sections of a lab report:

1. The research question
2. Background information
3. The hypothesis (supported by some background information)
4. The independent, dependent and control variables
5. Materials and method, clearly indicating how you will manipulate or measure the different variables.

**NOTE: Sufficient data means: 3 repetitions of 5 varieties of the independent variable**

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**The deadline for the formative assessment is, Friday January 18th 2019.**

**You will carry out this investigation in the lab and your summative lab report for Criterion B and Criterion C will be due a week after you have finished collecting data. More information will be given during the investigation weeks.**