IA Critieria 24 marks total

Personal Engagement 2 marks (8%)

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| Mark | Descriptor |
| 0 | The student’s report does not reach a standard described by the descriptors below. |
| 1 | **The evidence of personal engagement with the exploration is limited with little****independent thinking, initiative or insight.**The justification given for choosing the research question and/or the topic underinvestigation does not demonstrate **personal significance, interest or curiosity.**There is little evidence of **personal input and initiative** in the designing, implementation orpresentation of the investigation. |
| 2 | **The evidence of personal engagement with the exploration is clear with significant****independent thinking, initiative or insight.**The justification given for choosing the research question and/or the topic underinvestigation demonstrates **personal significance, interest or curiosity.*** Did you explain why you chose this topic?

There is evidence of **personal input and initiative** in the designing, implementation orpresentation of the investigation.* Is this your design? Were aspects of the design explained on its use and why?
* If a simulation was used, have you expanded the procedure and extrapolated data for it?
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This is an area where you must give some opinions on why you wanted to do this particular topic.

Give reasons why it is important to you, why it sparked a curiosity, or if it’s something you’ve just

always wanted to know about. Elaborate in the background section.

Exploration 6 marks (25%)

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| Mark | Descriptor |
| 0 | The student’s report does not reach a standard described by the descriptors below*.* |
| 1-2 | The topic of the investigation is identified and a research question of some relevance is**stated but it is not focused**.The background information provided for the investigation is **superficial** or of limitedrelevance and does not aid the understanding of the context of the investigation.The methodology of the investigation is only appropriate to address the research question toa very limited extent since it takes into consideration few of the significant factors that mayinfluence the relevance, reliability and sufficiency of the collected data.The report shows evidence of limited awareness of the significant **safety,** ethical orenvironmental issues that are **relevant to the methodology of the investigation**\*. |
| 3-4 | The topic of the investigation is identified and a relevant but not fully focused researchquestion is described.The background information provided for the investigation is mainly appropriate andrelevant and aids the understanding of the context of the investigation.The methodology of the investigation is mainly appropriate to address the research questionbut has limitations since it takes into consideration only some of the significant factors thatmay influence the relevance, reliability and sufficiency of the collected data.The report shows evidence of some awareness of the significant **safety,** ethical orenvironmental issues that are **relevant to the methodology of the investigation**\*. |
| 5-6 | The topic of the investigation is identified and a relevant and fully focused research questionis clearly described.* The research question should have a clearly identified dependent and independent variable? Does it state what variable is being used and how to measure it specifically?

 The background information provided for the investigation is entirely appropriate andrelevant and enhances the understanding of the context of the investigation.* Information about the investigation is given in paragraph form. Explanation of the variables and why they are used
* How will this be related to a real life situation?
* DID YOU CITE YOUR INFORMATION?

The methodology of the investigation is highly appropriate to address the research questionbecause it takes into consideration all, or nearly all, of the significant factors that mayinfluence the relevance, reliability and sufficiency of the collected data.* Your procedure can be repeated by ANYBODY! Did you proofread it? Have someone else proofread it?
* Is the dependent variable given?
* Is the independent variable given?
* Are all controlled variables applicable given and explained?
* Were all variables controlled in the procedure?
* Were all units appropriate and given?
* Did you give reasons for why that procedure was done?

The report shows evidence of full awareness of the significant **safety,** ethical orenvironmental issues that are **relevant to the methodology of the investigation**\*.* Were safety measures given where appropriate?
* Were any ethical considerations with living organisms mentioned and explained completely? Are animal policies followed?
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Analysis 6 marks (25%)

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| Mark | Descriptor |
| 0 | The student’s report does not reach a standard described by the descriptors below. |
| 1-2 | The report includes **insufficient relevant** raw data to support a valid conclusion to theresearch question.Some **basic** data processing is carried out but is either too **inaccurate or too insufficient to****lead to a valid** conclusion.The report shows evidence of little consideration of the impact of measurement uncertaintyon the analysis.The processed data is incorrectly or insufficiently interpreted so that the conclusion is invalidor very incomplete. |
| 3-4 | The report includes relevant but incomplete quantitative and qualitative raw data that couldsupport a simple or partially valid conclusion to the research question.Appropriate and sufficient data processing is carried out that could lead to a broadly validconclusion but there are significant inaccuracies and inconsistencies in the processing.The report shows evidence of some consideration of the impact of measurement uncertaintyon the analysis.The processed data is interpreted so that a broadly valid but incomplete or limited conclusionto the research question can be deduced. |
| 5-6 | The report includes sufficient relevant quantitative and qualitative raw data that couldsupport a detailed and valid conclusion to the research question.* Is qualitative data given? Colors, sizes, textures, details seen…
* Is there enough quantitative data? i.e., 5 variations of the independent variable by 5 trials? Could you add to simulation data with real data?
* Is all raw data given in an appropriate table form that is easy to read and CLEARLY LABELED?

Appropriate and sufficient data processing is carried out with **the accuracy** required toenable a conclusion to the research question to be drawn that is fully **consistent** with theexperimental data.* Is data processed? This should be more than just a mean (average); SD? Rate? etc
* Is a graph(s) shown and labeled completely with TITLE, and both axes with units?
* Are there error bars for raw data? ( mean or SD)- this shows uncertainties – are these given in +/- form next to units, with units?
* Did you give a sample calculation, showing equation and with numbers from one trial of experiment?

The report shows evidence of full and appropriate consideration of the impact ofmeasurement uncertainty on the analysis.* Is the uncertainty explained? What did those error bars mean and how does this impact the investigation? What does it mean to you in context of the experiment?
* Statistically, has the data been explained?

The processed data is correctly interpreted so that a completely valid and detailed conclusionto the research question can be deduced.* Double check data processing? Is it correct? It will be checked….
* Is there an appropriate trend line and is it explained?
* If used, is the histogram in the appropriate form?
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Evaluation 6 marks (25%)

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| Mark | Descriptor |
| 0 | The student’s report does not reach a standard described by the descriptors below. |
| 1-2 | A conclusion is **outlined** which is not relevant to the research question or is not supported bythe data presented.The conclusion makes superficial comparison to the accepted scientific context.Strengths and weaknesses of the investigation, such as limitations of the data and sources oferror, are **outlined** but are restricted to an **account** of **the practical** or **procedural issues**faced.The student has **outlined** very few realistic and relevant suggestions for the improvementand extension of the investigation. |
| 3-4 | A conclusion is **described** which is relevant to the research question and supported by thedata presented.A conclusion is described which makes some relevant comparison to the accepted scientificcontext.Strengths and weaknesses of the investigation, such as limitations of the data and sourcesof error, are **described** and provide evidence of some awareness of the **methodological****issues\*** involved in establishing the conclusion.The student has **described** some realistic and relevant suggestions for the improvement andextension of the investigation. |
| 5-6 | A detailed conclusion is **described and justified** which is entirely relevant to the researchquestion and fully supported by the data presented.A conclusion is correctly **described and justified** through relevant comparison to theaccepted scientific context.* Have you compared your work to context found in literature? DID YOU CITE THIS?
* Have you related your conclusion to REAL LIFE? For what reason is this information useful?
* HAS THE ORIGINAL QUESTION OF YOUR RESEARCH BEEN ANSWERED? HAVE YOU REFENCED THIS?
* Have you cited your data specifically in the conclusion? Yes, it’s already in the table, now repeat it with words – use it in your conclusion.

Strengths and weaknesses of the investigation, such as limitations of the data and sources oferror, are **discussed** and provide evidence of a clear understanding of the **methodological****issues**\* involved in establishing the conclusion.* Have you evaluated your own methods – the procedure you designed – were there things that made it weak or could have been done differently? Were there errors in measurement, time frames, variables that should have been controlled better?

The student has **discussed** realistic and relevant suggestions for the improvement andextension of the investigation.* For each of the limitations, have you explained how it could have been changed realistically to make a better impact on the data?
* How can your experiment be expanded?
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Communication 4 marks (17%)

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| Mark | Descriptor |
| 0 | The student’s report does not reach a standard described by the descriptors below. |
| 1-2 | **The presentation of the investigation is unclear, making it difficult to understand the****focus, process and outcomes.**The report is not well structured and is unclear: the necessary information on focus, processand outcomes is missing or is presented in an incoherent or disorganized way.The understanding of the focus, process and outcomes of the investigation is obscured by thepresence of inappropriate or irrelevant information.There are many errors in the use of subject-specific terminology and conventions\*.* \*For example, incorrect/missing labelling of graphs, tables, images; use of units, decimal places
 |
| 3-4 | **The presentation of the investigation is clear. Any errors do not hamper understanding****of the focus, process and outcomes**.The report is well structured and clear: the necessary information on focus, process andoutcomes is present and presented in a coherent way.* Grammar and spelling count!
* Have you or someone else proofread this work?

The report is relevant and concise thereby facilitating a ready understanding of the focus,process and outcomes of the investigation.* Is data and information repeated in appropriate places but explained in context?
* BSing through the paper is obvious – be concise in what you want to say.

The use of subject-specific terminology and conventions is appropriate and correct. Anyerrors do not hamper understanding.* Are units present; tables and graphs labeled; decimal place on all numbers the same?
* Are citations correctly formatted?
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Report must be 6 – 12 pages in length.

MORE THAN 12 pages will lose points on communication because you obviously

are not being concise.