**Investigation 3: Moderator comments**

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| **Personal engagement  x/2** | **Exploration  x/6** | **Analysis  x/6** | **Evaluation  x/6** | **Communication  x/4** | **Total  x/24** |
| 2 | 5 | 3 | 5 | 4 | 19 |

**Personal engagement**

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| **Mark** | **Descriptor** |
| 2 | * The justification given for choosing the research question and/or the topic under investigation demonstrates **personal significance, interest or curiosity**. 2 * There is evidence of **personal input and initiative** in the designing, implementation or presentation of the investigation. 2 |
| **Moderator’s award**  2 | **Moderator’s comment**  The personal engagement of the student is clear both in the conception of the investigation and its implementation. |

**Exploration**

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| **Mark** | **Descriptor** |
| 3–4 | * The methodology of the investigation is mainly appropriate to address the research question but has limitations since it takes into consideration only some of the significant factors that may influence the relevance, reliability and sufficiency of the collected data. 4 * The report shows evidence of some awareness of the significant **safety**, ethical or environmental issues that are **relevant to the methodology of the investigation**. 4 |
| 5–6 | * The topic of the investigation is identified and a relevant and fully focused research question is clearly described. 6 * The background information provided for the investigation is entirely appropriate and relevant and enhances the understanding of the context of the investigation. 6 |
| **Moderator’s award**  5 | **Moderator’s comment**  A focused research question is established and it is set in a relevant scientific context.  The methodology shows good consideration of variables that need controlling.  The methodology is appropriate to the research question though it will not produce very precise quantitative data.  Some safety factors are considered but the chemicals used have not been considered as the proforma used marks chemicals as N/A which is not the case. |

**Analysis**

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| **Mark** | **Descriptor** |
| 1–2 | * Some **basic** data processing is carried out but is either too **inaccurate or too insufficient to lead to a valid** conclusion. 2 |
| 3–4 | * The report includes relevant but incomplete quantitative and qualitative raw data that could support a simple or partially valid conclusion to the research question. 4 * The report shows evidence of some consideration of the impact of measurement uncertainty on the analysis. 3 * The processed data is interpreted so that a broadly valid but incomplete or limited conclusion to the research question can be deduced. 3 |
| **Moderator’s award**  3 | **Moderator’s comment**  Clear qualitative observations are made.  There is a small amount of quantitative data which limits the processing. There is an attempt to convert the qualitative data into quantitative data for data presentation (for example, trace = 1). This is very subjective.  Where quantitative data is presented there is an appreciation of the impact of uncertainties.  The interpretation of the data is, at times, over optimistic. |

**Evaluation**

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| **Mark** | **Descriptor** |
| 3–4 | * A conclusion is **described** which is relevant to the research question and supported by the data presented. 3 * A conclusion is described which makes some relevant comparison to the accepted scientific context. 4 |
| 5–6 | * Strengths and weaknesses of the investigation, such as limitations of the data and sources of error, are **discussed** and provide evidence of a clear understanding of the **methodological issues** involved in establishing the conclusion. 5 * The student has **discussed** realistic and relevant suggestions for the improvement and extension of the investigation. 5 |
| **Moderator’s award**  5 | **Moderator’s comment**  A conclusion is drawn for which there is some evidence, however, the data upon which the conclusion is based is quite fragile. The student should be more tentative.  The reliability of the method is thoroughly discussed and the student seems to be well aware of its weaknesses and proposes serious suggestions for its improvement. |

**Communication**

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| **Mark** | **Descriptor** |
| 3–4 | * The report is well structured and clear: the necessary information on focus, process and outcomes is present and presented in a coherent way. 4 * The report is relevant and concise thereby facilitating a ready understanding of the focus, process and outcomes of the investigation. 3 * The use of subject specific terminology and conventions is appropriate and correct. Any errors do not hamper understanding. 4 |
| **Moderator’s award**  4 | **Moderator’s comment**  The report is well structured and it is relevant, although it could a bit more concise in places. The subject-specific terminology is correct and the conventions are mostly adhered to. |