**Investigation 5: 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 | 4 | 5 | 5 | 3 | 19 |

**Personal engagement**

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| **Mark**  | **Descriptor**  |
| 1 | * The justification given for choosing the research question and/or the topic under investigation does not demonstrate **personal significance, interest or curiosity**. 1
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| 2 | * There is evidence of **personal input and initiative** in the designing, implementation or presentation of the investigation. 2
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| **Moderator’s award** 2 | **Moderator’s comment** Personal interest and curiosity are not clearly evident.Method clearly shows originality in the application of a standard gravimetric method in osmosis to a new problem. |

**Exploration**

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| **Mark**  | **Descriptor**  |
| 1–2 | * The report shows evidence of limited awareness of the significant **safety**, ethical or environmental issues that are **relevant to the methodology of the investigation**. 2
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| 3–4 | * The background information provided for the investigation is mainly appropriate and relevant and aids the understanding of the context of the investigation. 4
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| 5–6 | * The topic of the investigation is identified and a relevant and fully focused research question is clearly described. 5
* The methodology of the investigation is highly appropriate to address the research question because it takes into consideration all, or nearly all, of the significant factors that may influence the relevance, reliability and sufficiency of the collected data. 5
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| **Moderator’s award** 4 | **Moderator’s comment** Topic clearly established and research question reasonably focused (the time span and scientific name of the species could have been added).The theoretical context is well established.Method is highly appropriate and clearly explained, only the detail of the cutting tool used and the variety of potato appear to be absent.Ethics and environment not an issue.Risk of using cutting tools ought to be mentioned but the technique described appears to be safe. |

**Analysis**

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| **Mark**  | **Descriptor**  |
| 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
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| 5–6 | * Appropriate and sufficient data processing is carried out with **the accuracy** required to enable a conclusion to the research question to be drawn that is fully **consistent** with the experimental data. 5
* The report shows evidence of full and appropriate consideration of the impact of measurement uncertainty on the analysis. 5
* The processed data is correctly interpreted so that a completely valid and detailed conclusion to the research question can be deduced. 6
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| **Moderator’s award** 5 | **Moderator’s comment** The raw quantitative data is sufficient to support a valid conclusion though the addition of qualitative observations would have improved it. The processing is accurate and sufficient to support a conclusion. Given that each of the initial and final masses of the potato cylinders is known, the standard deviations of the percentage changes could have been calculated. The interpretation is correct and can lead to a valid conclusion. Overall, the impact of the uncertainties is fully considered but it is not always clear how the uncertainties were arrived at. |

**Evaluation**

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| **Mark**  | **Descriptor**  |
| 3–4 | * A conclusion is described which makes some relevant comparison to the accepted scientific context. 4
* The student has **described** some realistic and relevant suggestions for the improvement and extension of the investigation. 4
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| 5–6 | * A conclusion is **described and justified** which is relevant to the research question and supported by the data presented. 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
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| **Moderator’s award** 5 | **Moderator’s comment** The conclusion is described and justified. Though the implications of the conclusion are discussed in a theoretical scientific context, the implications for potato storage are not considered. The work shows an awareness in the methodology in the discussion of the strengths and weaknesses in the impact of temperature, timing, the use of distilled water and the sampling of the tissue, which led to a valid suggested area for extension work. It would have been nice to know why light levels might influence the experiment.The suggested improvements are relevant and realistic. |

**Communication**

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| **Mark**  | **Descriptor**  |
| 1–2 | * The report is not well structured and is unclear: the necessary information on focus, process and outcomes is missing or is presented in an incoherent or disorganized way. 2
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| 3–4 | * 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. 3
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| **Moderator’s award** 3 | **Moderator’s comment** The work is generally well structured and focused. However, there is an important omission in the description of the method and there are some inconsistencies in the temperatures used: is it 25°C or 20°C? The anomalies are a bit laboured. It could be more concise in places. The terminology used is correct. Only one slip in the use of turgidity was noticed. Overall the use of the terminology could have been a bit more rigorous. The argument is clear and concise.The conventions are respected in tables and in graphs. |