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| **Extended essay: Example commentary** |
| **Subject** | Biology | **WSEE theme (if applicable):** |  |
| **Category for language essays (if applicable):** |  | **Subjects used for WSEE (if applicable):** |  |
| **Title of essay:** | Effects of different calcium salts in growth solutions on the growth of the stems of basil (*Ocimum basilicum*) plants grown hydroponically  |
| **Research question:** | What effects do different calcium salts in growth solutions have on the growth of the stems of basil (*Ocimum basilicum*) plants grown hydroponically?  |
| **Assessment details** |
| **Criterion**  | **Mark awarded** | **Commentary** |
| A: Focus and method[Maximum possible mark: 6] | 3 | The work meets the standard described by the 3–4 markband because the topic is clearly identified and the research question is clearly stated but only partially focused. All three strands are in this markband. It is a weaker example of the markband because the method described will not yield the kind of data needed to answer the research question or, at best, it is unclear as to whether it will. The focus is on the anions rather than on calcium. There is no account of the ionic content of the tap water. The selected sources are relevant but only a few are published scientific articles. It is not in the higher markband because the research question is not strongly focused; it is unclear whether the essay is about calcium ions or the anions present in the solutions, so it is not clear if the methodology will yield data that can be used to answer the research question. It is not in the lower markband because there is a clearly identifiable topic and research question, as well as clear evidence of attention to a method, although this may not be entirely suitable.  |
| B: Knowledge and understanding[Maximum possible mark: 6] | 3 | The work meets the standard described by 3–4 markband because the sources are relevant and provide useful information on the topic. Knowledge and understanding are evidenced by the correct use of terms and concepts. It is a weaker example of the markband because it is not clear in the introduction that the sources will support the discussion. In addition, there is limited understanding of the role of anions and solubility. It is not in the higher markband because many of the sources are superficial and do not provide insight into any potential underlying biological mechanisms. This limits the candidate in being able to demonstrate understanding. It is not in the lower markband because some of the sources do provide useful and relevant biological background that could be used to demonstrate understanding.  |
| C: Critical thinking[Maximum possible mark: 12] | 3 | The work meets the standard described by the 1–3 markband because only some suitable sources have been accessed and used and the research is barely adequate in terms of how it relates to the research question. Only some of the data collected (on stem length) is relevant and appropriate. Many relevant factors including the use of controls and the importance of solution concentrations are ignored or treated inadequately. It is a strong example of the markband because the “research”, as represented by the data collected through experimentation, as well as the ideas gleaned from the sources are not quite sufficient to answer the research question. It is not in the higher markband because there is no statistical analysis, processing is limited to graphical and visual analysis, and there is only a superficial evaluation. In addition, the significance of the very large error bars is not recognized or taken into consideration in the discussion. The discussion is limited and there is no clear conclusion relating to the research question (no conclusion relating the different sources of calcium to the growth of the plants). It is not in the lower markband because there is some attempt to analyse by determining growth rates and to discuss how these are affected by the different solutions.  |
| D: Presentation[Maximum possible mark: 4] | 3 | The work meets the standard described by the 3–4 markband because all of the important structural elements (topic statement, research question, table of contents, page numbers, in-text references, bibliography etc.) are present. Any weaknesses here do not interfere with the understanding of the essay. It is a weaker example of the markband because referencing style is not consistent, placement of the bibliography is inappropriate and the presentation of data in graphs especially is not completely effective. The conclusion and discussion are merged, and this detracts from overall understanding of the essay. It is not in the lower markband because there are no obvious or significant omissions in terms of structure and layout.  |
| E: Engagement[Maximum possible mark: 6] | 3 | The work meets the standard described by the 3–4 markband because there is evidence of decisions made by the candidate to attempt to ensure controlled conditions and a more focused research direction. Some consideration is given to expanding the range of dependent variables to reveal other possible effects on growth. It is a weaker example of the markband because some of the choices made were not well considered (dealing with monovalent anions and adjusting the concentrations to obtain some parity) and most reflections are descriptive rather than evaluative. It is not in the lower markband because reflections at each stage are articulate and consider a range of ideas and choices made by the candidate.  |
| Total marks awarded | 15/34 |  |