

There were useful comments made by the teachers on the work. These are useful as they provide guidance on how the teacher was marking. Thank you.

There seemed to be a wide variety of interesting investigations though some were rather classic. This will impact particularly on the PE criterion.

All the criteria were impacted by the moderation with Analysis being affected the most.

### **Personal Engagement**

Most of the investigations showed evidence of independent thinking. The candidates took the trouble to express their personal significance. Most of the investigations had clear signs of personal input either through the design and carrying out of the investigations or in the background research done to support the experimental work.

### **Exploration**

In general, the research questions required more focus. For example, the scientific names need to be stated and the range of the independent variable ought to be given.

The background research was in general relevant and useful to the investigations though the independent variable should be justified somewhere. The dependent variable needs to be linked to the investigation. In most cases, however, this was made clear.

Overall, the methods were well conceived and easy to follow. There was usually a good consideration of the important control variables and usually sufficient data was collected.

Safety, ethics and environmental impact received adequate.

### **Analysis**

The raw quantitative data was presented correctly though the qualitative observations were often missing. The processing of the data seemed to discriminate well between the candidates, which the teacher(s) seemed to appreciate.

The treatment of uncertainties was in general weak. Apart from presenting the measurement uncertainties for the instruments used this also includes the variation in the material used. Most candidates presented measurement uncertainties or degrees of precision in their data but did not discuss their impact. Most candidates calculated standard deviations but there were those who did not discuss them. Some candidates decided to exclude data points considered as outliers without due justification.

The interpretation of the data was influenced by the degree of processing. Weak processing led to weak interpretation.

### **Evaluation**

Generally, the conclusions were supported by the data though in one case an assumption was made when other factors were probably influencing the results more. In all cases appropriate scientific context was used to support the conclusion though it could have gone further and been more precise in some cases.

Few candidates considered the strengths of their investigation. Weaknesses were identified. They could have received more thorough evaluation to determine their impact on the results.

The improvements proposed could have been more precise and should have directly addressed the weaknesses identified.

**Communication**

It seemed that the teacher had identified the important factors that influenced this criterion. Weaknesses included: not identifying the error bars on graphs, inconsistent decimal places in data, incorrect format for scientific names, missing the data of access for online sources. A number of the data tables were inadequately presented having just been cut and pasted in from a spread sheet. They possessed no grid lines and the data was not centered.