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| **IB Physics Internal Assessment**  **Comments on Student Script “D”**  Research Design, Data Analysis, Conclusion, Evaluation | SafariScreenSnapz001.tif |

“**Using Satellite Data to Determine the Mass of the Earth”** (database IA)

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| **Research**  **Design 0 – 6** | **Data**  **Analysis 0 – 6** | **Conclusion**  **0 – 6** | **Evaluation**  **0 – 6** | **Total**  **0 – 24** |
| **6** | **6** | **6** | **6** | **24** |

#### Research design assesses the extent to which the student effectively communicates the methodology (purpose and practice) used to address the research question

**Research Design Assessment** is a solid 6. What more could we ask for?

**Research Design 1st Descriptor**

The research question is described very well and within a theoretical and appropriate context.

**Research Design 2nd Descriptor**

The method aligns nicely with the known classical theory (all within IB level) including assumptions. There is no concern about an ample amount of data; nearly two thousand data sets are more than enough. Repeated measurements are not relevant here (but the selection of data will be given some thought in the evaluation).

**Research Design 3rd Descriptor**

There would be no problems with the reproduction of this investigation. Lots of references and details of relevant theory are all given.

#### Data analysis assesses the extent to which the student’s report provides evidence that the student has recorded, processed and presented the data in ways that are relevant to the research question.

**Data Analysis Assessment** earns top marks again, level 6.

**Data Analysis 1st Descriptor**

The recording and processing of the data is very clear (nicely presented in steps), logical (makes good sense) and precise (significant figures are appreciated).

**Data Analysis 2nd Descriptor**

Given this type of database investigation, we cannot expect the normal propagation of uncertainties found in typical hands-on lab work. Doing so would be a Herculean job, given so much data. Therefore, in this case, the appreciation of significant figures and a statistical analysis of the data when processed is appropriate and completely acceptable. Gradients and *y*-intercept uncertainties are addressed statistically.

**Data Analysis 3rd Descriptor**

The processing clearly addresses the research question; every step of the way is explained and nicely presented. Accuracy is addressed where relevant.

#### Conclusion assesses the extent to which the student successfully answers their research question with regard to their analysis and the accepted scientific context.

**Conclusion Assessment** earns top marks once again, level 6.

**Conclusion 1st Descriptor**

There is no doubt that the analysis addresses the research question, and that the conclusion responds to the research question. The detailed analysis justifies the conclusion and is consistent and accurate.

**Conclusion 2nd Descriptor**

The student nicely compares the accepted value of the mass of the earth with their experimental results. The student’s value is slightly higher, but less than 1%. This difference could be to rounding and significant figures.

#### Evaluation assesses the extent to which the student’s report provides evidence of evaluation of the investigation methodology and has suggested improvements.

**Evaluation Assessment** is level 6, no questions about this.

**Evaluation 1st Descriptor**

The student has addressed the top descriptor a number of times (only once is needed to achieve high marks). The student appreciates the quality of data and has done much to understand the nature of their data and how it relates to the research question.

**Evaluation 2nd Descriptor**

Realistic and very specific details are explained addressing the quality of data. The student has demonstrated insight and understanding here.

**Overall:** In about 2500 words the student has covered the topic in more than enough detail and with relevant and supporting insight and information to earn top marks. ***This is an excellent example of a syllabus-based IA totally within the skill expectations for an IB student.***

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07 August 2024