

- The internal assessment criteria
- Guidance for the use of the internal assessment criteria

Assessed student work

- Overview
- Investigation 1: The real and the apparent positions of the stars in Orion (Database and spreadsheet)
- Investigation 2: Investigating the lift force of a toy helicopter (Hands-on)
- Investigation 3: Obtaining Wien's displacement law of electromagnetic radiation (Simulation)
- Investigation 4: Investigating the force on an electric charge moving through a magnetic field (Simulation)
- Investigation 5: Determining solar characteristics using planetary data (Database)
- Investigation 6: Physical and mathematical models of the greenhouse effect (Hands-on and mathematical models)
- **Investigation 7: Exploring the relationship between the pressure of the ball and coefficient of restitution (Hands-on)**
- Investigation 8: The exponential nature of a bouncing ping-pong ball (Hands-on and modelling)
- Investigation 9: Investigation water depth pressure (Hands-on)
- Investigation 10: How temperature affects the vibration rate of a tuning fork (Hands-on)

Appendix

- Changes in the syllabus content

Investigation 7: Exploring the relationship between the pressure of the ball and coefficient of restitution (Hands-on)

To view the various elements of this example, please use the icons at the side of the screen.

Note: The comments in the annotated examples match the labelling on teacher forms.

Examiner comments

	Personal engagement	Exploration	Analysis	Evaluation	Communication	Total
	x/2	x/6	x/6	x/6	x/4	x/24
1		3	4	3	2	13

Personal engagement

This criterion assesses the extent to which the student engages with the exploration and makes it their own. Personal engagement may be recognized in different attributes and skills. These could include addressing personal interests or showing evidence of independent thinking, creativity or initiative in the designing, implementation or presentation of the investigation.

Mark

Descriptor

The evidence of personal engagement with the exploration is limited with little independent thinking, initiative or creativity.

- 1
- The justification given for choosing the research question and/or the topic under investigation does not demonstrate **personal significance, interest or curiosity**.
 - There is little evidence of **personal input and initiative** in the designing, implementation or presentation of the investigation.

Moderator's award	Moderator's comment
1	There is some evidence of personal interest and curiosity and relevance to the student. The design and method are straightforward and do not demonstrate personal input. The first descriptor is nicely satisfied, but the second is not.

Exploration

This criterion assesses the extent to which the student establishes the scientific context for the work, states a clear and focused research question and uses concepts and techniques appropriate to Diploma Programme level. Where appropriate, this criterion also assesses awareness of safety, environmental, and ethical considerations.

Mark	Descriptor
3-4	<ul style="list-style-type: none"> • The topic of the investigation is identified and a relevant but not fully focused research question is described. • The background information provided for the investigation is mainly appropriate and relevant and aids the understanding of the context of the investigation. • 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.
Moderator's award	Moderator's comment
3	The scientific context is briefly explained. The variety of experiments makes any single research question unfocused and the teacher should have guided the student to make a thorough investigation of the coefficient of restitution as a function of pressure only. This would have allowed for more in-depth analysis. The methodology is basic, and there is some awareness of safety issues.

Analysis

This criterion assesses the extent to which the student's report provides evidence that the student has

selected, recorded, processed and **interpreted** the data in ways that are relevant to the research question and can support a conclusion.

Mark	Descriptor
3–4	<ul style="list-style-type: none"> The report shows evidence of some consideration of the impact of measurement uncertainty on the analysis. The processed data is interpreted so that a broadly valid but incomplete or limited conclusion to the research question can be deduced.
5–6	<ul style="list-style-type: none"> The report includes sufficient relevant quantitative and qualitative raw data that could support a detailed and valid conclusion to the research question. 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.

Moderator's comment

Moderator's award	The student has indeed selected, recorded and processed appropriate data, including uncertainties and gradients on some of the graphs. The accuracy of the data has been represented with error bars where appropriate. The impact of uncertainties has not been addressed under analysis but could be part of the conclusion. The student does go through the motions of what is expected here, but there is a serious flaw with labelling the data where the student mixes up "grass" and "dirt".
4	

Evaluation

This criterion assesses the extent to which the student's report provides evidence of evaluation of the investigation and the results with regard to the research question and the accepted scientific context.

Mark	Descriptor
1–2	<ul style="list-style-type: none"> Strengths and weaknesses of the investigation, such as limitations of the data and sources of error, are outlined but are restricted to an account of the practical or procedural issues faced.
3–4	<ul style="list-style-type: none"> A conclusion is described which is relevant to the research question and supported by the data presented. The student has described some realistic and relevant suggestions for the improvement and extension of the investigation.

Moderator's award Moderator's comment

The student graphed the appropriate data, described it to a limited degree and also

- 3 provided some attempt at an explanation of the results. However, there was no mention of relating his or her results to accepted scientific context. According to the student a justification is attempted. Some strengths and weaknesses are realized, and improvements and extensions are hinted at but often the language is vague and not clear.

Communication

This criterion assesses whether the investigation is presented and reported in a way that supports effective communication of the focus, process and outcomes.

Mark	Descriptor
	The presentation of the investigation is unclear, making it difficult to understand the focus, process and outcomes.
1–2	<ul style="list-style-type: none"> • 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. • The understanding of the focus, process and outcomes of the investigation is obscured by the presence of inappropriate or irrelevant information. • There are many errors in the use of subject specific terminology and conventions*.

Moderator's comment

Moderator's award	The research issues are not as focused as they should have been. In fact, there are two sets of investigations going on at once. The teacher should have advised the student in the planning stage to focus only on the coefficient of restitution and pressure investigation. A number of sentences are vague, some scientific context and terminology is wrong, and the graphs do not always help the understanding of the data.
2	



[Student work \(PDF\)](#)



[Annotated student work \(PDF\)](#)



Examiner comments

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