

Guidance for the use of the internal assessment criteria

The internally assessed component of the course is divided into five sections.

- Personal engagement
- Exploration
- Analysis
- Evaluation
- Communication

Each section aims to assess a different aspect of the student's research abilities. The sections are differently weighted to emphasize the relative contribution of each aspect to the overall quality of the investigation. As the investigations, and therefore the approaches to the investigation, will be specific to each student, the marking criteria are not designed to be a tick-chart markscheme and each section is meant to be seen within the context of the whole. As such, a certain degree of interpretation is inevitable. The following tips are designed to help focus on the intention of each section, rather than be seen as a definitive approach.

Personal engagement

The emphasis within this section is on individuality and creativity within the investigation. The question to ask is, has the chosen research question been devised as a result of the personal experience of the student? The question could be a result of observations made in the student's own environment or ideas that the student has had as the result of learning, reading or experimenting in class. The investigation does not have to be ground-breaking research, but there should be an indication that independent thought has been put into the choice of topic, the method of inquiry and the presentation of the findings. The topic chosen should also be of suitable complexity. If the research question is very basic or the answer self-evident then there is little opportunity to gain full marks for exploration and analysis as the student will not have the opportunity to demonstrate his or her skills.

Exploration

The issue here is the overall methodology. Students need to take their individual ideas and translate them into a workable method. Students must also demonstrate the thinking behind their ideas using their subject knowledge. The information given must be targeted at the problem rather than being a general account of the topic matter, in order to demonstrate focus on the issues at hand.

What needs to be seen is a precise line of investigation that can be assessed using scientific protocols. It is then expected that the student gives the necessary details of the method in terms of variables, controls and the nature of the data that is to be generated. This data must be of sufficient quantity and treatable in an appropriate manner, so that it can generate a conclusion, in order to fulfill the criteria of analysis and evaluation. If the method devised does not lead to sufficient and appropriate data, this will lead to the student being penalized in subsequent sections where this becomes the crux of the assessment.

Health and safety is a key consideration in experimental work and forms part of a good method. If the student is working with animals or tissue, it is reasonable to expect there to be evidence that the guidelines for the use of animals in IB World Schools have been read and adhered to. The use of human subjects in experiments is also covered by this policy. If the student is working with chemicals, some explanation of safe handling and disposal would be expected. Full awareness is when all potential hazards have been identified, with a brief outline given as to how they will be addressed. It is only acceptable for there to be no evidence of a risk assessment if the investigation is evidently risk-free—such as in investigations where a database or simulation has been used to generate the data.

Analysis

At the root of this section is the data generated and how it is processed. If there is insufficient data then any treatment will be superficial. It is hoped that a student would recognize such a lack and revisit the method before the analysis is arrived at. Alternatively, the use of databases or simulations to provide sufficient material for analysis could help in such situations.

Any treatment of the data must be appropriate to the focus of the investigation in an attempt to answer the research question. The conclusions drawn must be based on the evidence obtained from the data rather than on assumptions. Given the scope of the internal assessment and the time allocated, it is more than likely that variability in the data will lead to a tentative conclusion. This should be recognized and the extent of the variability considered. The variability should be demonstrated and explained and its impact on the conclusion fully acknowledged. It is important to note that, in this criterion, the word "conclusion" refers to a deduction based on direct interpretation of the data, which is based on asking questions such as: What does the graph show? Does any statistical test used support the conclusion?

Evaluation

Although it may appear that the student is asked to repeat the analysis of the data and the drawing of a conclusion again in the evaluation, the focus is different. Once again the data and conclusion come under scrutiny but, in the evaluation, the conclusion is placed into the context of the research question. So, in the analysis, it may be concluded that there is a positive correlation between x and y ; in the evaluation, the student is expected to put this conclusion into the context of the original aim. In other words, does the conclusion support the student's original thinking in the topic? If not, a consideration of why it does not will lead into an evaluation of the limitations of the method and suggestions as to how the method and approach could be adjusted to generate data that could help draw a firmer conclusion. Variability of the data may well be mentioned again in the evaluation as this provides evidence for the reliability of the conclusion. This will also lead into an assessment of the limitations of the method. It is the focus on the limitations that is at issue in the evaluation, rather than a reiteration that there is variability.

Communication

The marking points for communication take the entire write-up into consideration. If a report is clearly written and logically presented there should be no need for the teacher to re-read it. The information and explanations should be targeted at the question in hand rather than being a general exposition of the subject area; in other words, the report should be focused. The vocabulary should be subject-specific and of a quality appropriate to diploma level. The subject-specific conventions that can be expected are the correct formats for graph and tables and cell headings, correct use of units and the recording of errors. This is not to say that the presentation needs to be faultless to gain full marks. Minor errors are acceptable as long as they do not have a significant bearing on understanding or the interpretation of the results.