

Extended Essay Marking Criteria

for essays written in the Mathematics subject group



Bonita Vista High School

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This document was produced by Jared Phelps, DP Coordinator at Bonita Vista High School by copying appropriate sections out of the "Extended Essay Guide for first exams 2027."

Criterion A: Framework for the Essay

Guiding question: *Do the research question, research methods, and structural conventions followed provide an effective framework for the essay?*

	Research question	Research methods	Structure
5-6 marks	The research question is relevant to the topic of investigation, clear, and focused in relation to the scope of the essay.	Research methods that are suitable for the research question are explained and applied effectively.	Structural conventions used in the essay effectively support communication of the research.
3-4 marks	The research question is relevant to the topic of their investigation and clear, but only partially focused in relation to the scope of the essay.	Research methods that are mostly suitable for the research question are explained and applied with partial effectiveness.	Structural conventions used in the essay support some aspects of the communication of the research.
1-2 marks	A research question is stated but it lacks relevance to the topic of investigation, clarity, or focus.	Research methods are used, but they are mostly unsuitable for the research question.	Structural conventions are present in the essay, but these do not support communication of the research.
0 marks	If the work does not reach a standard outlined by the performance level descriptors above, 0 marks are awarded for this criterion.		

Subject Specific Guidance (specific to Mathematics essays)

Clearly state your research question and ensure your essay remains focused on it throughout. Make sure your mathematics is written well by using an equation editor. This will help you avoid poor mathematical presentation, such as not using a new line for each step in your algebra, or using inappropriate symbols like * for multiplication and ^ for powers.

General Guidance (general guidance shared across all subject essays)

Research question

Make sure the research question arises from the context of a specific topic that is related to your chosen DP subject(s) and that it really is a question. The question should be specific and

focused. Make clear to the reader the significance and purpose of the research question and ensure that it connects with the knowledge and understanding evident in your essay.

The research question should:

- encourage critical analysis rather than a descriptive or narrative response
- allow for the development of a strong line of argument
- avoid combining more than one question (i.e. “double-barrelled”), in which case the scope of the essay would probably be too broad
- avoid questions that are liable to lead to writing a descriptive essay; you should aim to be analytical and evaluative
- use higher-order questions that engage deeper thinking processes—wording such as “how significant...?”, “how successful ...?”, “to what extent ...?” or “what if ...?” is more likely to engage you with analysis and inspire critical evaluation of your research findings
- not lead the reader to a self-evident answer; rather, the question should create an opportunity for you to research the topic thoroughly and construct a line of argument that is not immediately obvious from the question itself.

Research methods

Explain the suitability of the research methods you have chosen to conduct your research and understand how these connect with the methodology of the subject(s) used. Remember that “methodology” is the overall research strategy and rationale, the lens through which the analysis occurs. Meanwhile, “research methods” are the specific tools and procedures used to collect and analyse data. For the extended essay, the understanding of “research methods” is necessarily broad, to cover the contexts of all subjects, including instances where students are limited to using “literature review” as their tool. If the approach to the essay involves experimentation or fieldwork, provide a description of the methods used that would allow the work to be repeated.

Make sure the reader can see evidence of how you have applied your chosen research methods. Ensure that there are sufficient sources of suitable quality to allow effective research using your chosen methods. If there are not enough, you may need to amend or change your research question or even reconsider your topic.

Structure

A successful academic essay generally follows a basic structure:

- An introduction which: presents your topic, provides background, tells the reader what you will focus on, and states your research question.
- A body which: has each paragraph making only one main point; analyzes, discusses, and evaluates research findings; and builds a line of argument supported by evidence
- A conclusion which: connects with your research question, brings together your main points, adding no new points, and makes the context of your line of argument clear and shows why it matters.

More specifically, as you write your extended essay you will need to be aware of any structural conventions that relate to academic writing in your chosen subject(s), for example, biology, geography, literature. Structural conventions are rules that should be followed. For instance, in geography and science essays, figures and tables are often used (though they are only included if they help to illustrate a point you are making). Figures and tables should always be clearly labelled and referred to in your essay text, for example, “the population has grown considerably over the last two decades (see figure 1)”.

Criterion B: Knowledge and understanding

Guiding question: *Does the student demonstrate knowledge and understanding of the subject matter being used in their research?*

	Knowledge	Understanding and Terminology	Understanding Concepts
5-6 marks	Comprehensive, relevant research materials are used to establish knowledge of the subject matter.	Relevant terminology is used accurately and consistently to demonstrate understanding of the subject matter.	Relevant concepts are explained and used effectively to demonstrate understanding of the subject matter.
3-4 marks	Relevant research materials are used to establish some knowledge of the subject matter.	Some relevant terminology is used accurately to demonstrate understanding of the subject matter.	Some relevant concepts are explained and used with partial effectiveness to demonstrate understanding of the subject matter.
1-2 marks	Research materials are used to establish knowledge of the subject matter but these materials lack relevance.	Terminology is used but it lacks accuracy or is very limited.	Concepts are identified but these are not relevant or are explained superficially.
0 marks	If the work does not reach a standard outlined by the performance level descriptors above, 0 marks are awarded for this criterion.		

Subject Specific Guidance (specific to Mathematics essays)

Showing your knowledge and clear understanding of the mathematics you use is arguably the most important criterion in a mathematics essay. If you have not shown that you really understand the mathematics, this will impact other criteria.

Do not be overly ambitious—an extended essay is not a research paper revealing that you have discovered something profound and new. Understand and explain something that is new to you (in more theoretical essays) or apply some mathematics that you understand well in a situation that is new (in more practical essays).

General Guidance (general guidance shared across all subject essays)

Knowledge

The reader should be able to see that you have thoughtfully applied the research findings to explore the topic systematically and build your knowledge of its subject matter. Research findings can include information from reviewing the literature, secondary sources, and data collected and processed. It should be relevant to the research question and support the development of arguments.

Avoid over-extensive quoting from your sources; your knowledge needs to be evident in your own writing. Remember, knowledge is important; it underpins the analysis, discussion and evaluation that demonstrates your critical thinking.

Understanding—Terminology

Subjects are to some extent identified by the specific terminology or “jargon” that academics use when writing or talking about them. If you incorporate subject-related terminology accurately and consistently in the writing of your extended essay, it helps to show that you understand the topic and the subject(s) it relates to. For example, incorporating the terminology “cells”, “cytoplasm” and “lipid” in a biology extended essay: “Typical cells have DNA as genetic material and a cytoplasm composed mainly of water, which is enclosed by a plasma membrane composed of lipid”.

Understanding—Concepts

In terms of the subjects that you study in the DP, concepts are the key ideas around which knowledge is developed. Correctly using concept words or phrases in your writing shows your understanding of the context of the research and supports well-founded analysis. For example, using the concept “marginalization” in a social and cultural anthropology extended essay: “Decades of marginalization has relegated this community to the edge of society, economically, politically, culturally and socially, limiting their access to productive resources and avenues for the realization of their productive human potential.”

Criterion C: Analysis and Line of Argument

Guiding question: *Does the student analyse the information presented in the essay and produce a coherent line of argument?*

	Analysis	Line of Argument
5-6 marks	Analysis in the essay is effective and consistently produces relevant findings.	A clear, sustained line of argument links the research question, research findings, and conclusions.
3-4 marks	The essay includes analysis that is partially effective and produces some relevant findings.	A partially consistent line of argument links the research question, research findings, and conclusions.
1-2 marks	The essay is descriptive rather than analytical.	A partial line of argument is present.
0 marks	If the work does not reach a standard outlined by the performance level descriptors above, 0 marks are awarded for this criterion.	

Subject Specific Guidance (specific to Language A: English essays)

Avoid the temptation to extend your analysis beyond the realm of your research question—this is likely to lessen the impact of your essay.

In more practical essays, it is better that the techniques you use to analyse your data are decided based on looking at that data, rather than being predetermined. In more theoretical essays, make sure that the mathematical theory described, and the illustrative examples used, remain focused on the research question. This will result in a consistent line of argument.

General Guidance (general guidance shared across all subject essays)

Analysis

Analysis means breaking down your topic to bring out its essential elements or structure; you can use your research question as a prompt. The aim is to understand the topic better and to demonstrate this in your writing by establishing relevant findings derived from your research. When you make a particular point of analysis, be sure to support it with relevant evidence from your research. If your essay is largely descriptive or narrative, it is unlikely to provide sufficient evidence of your skills of analysis.

Line of argument

A line of argument is a reasoned thread that runs through your essay, linking its various elements, bringing overall coherence and supporting the position you are taking. In other words, it is a set of logical connections with signposts that help the reader to see where your argument has come from and where it leads. A clear line of argument will complement your analysis and contribute to a convincing and effective piece of writing.

Why is this necessary? It helps the reader follow the logic of your argument, so they can see a clear pathway through the details of data, quotations and information that you present to support your position. Just as importantly, it also helps you, the author, to navigate your way clearly as you work through the subsections of the essay. A solid line of argument:

- helps your reader understand your position
- shows that you have a strong understanding of the material
- helps justify the choices you have made along the way
- helps to link your ideas coherently
- shows that you see “the big picture”
- moves your argument forward.

Ideally, you want the reader to be able to agree with your conclusions. For this to happen, they will need to be able to see how you have linked together the various parts of the essay in a logical and effective way. You do not want the reader to be asking, “This is interesting but how do the different parts fit together?”. The “fitting together” is your job as the author, not the job of the reader. The way the elements of the essay fit together should be obvious and explicit. There should be:

- a thread that links the elements of the essay
- an intentional and sustained set of logical connections.

What are the key elements of a “line of argument”? An extended essay typically has certain subsections that may be signposted by chapter headings or may emerge organically from the way the essay is written, as follows.

- Research question
- Research findings
- Conclusions

These sections are the key elements of the line of argument. Their beginnings and ends need to be signposted so the reader knows where they start and finish. To create an effective line of argument, you do not need to add an “extra layer”, or an extra paragraph, to the essay. Instead, you connect the parts that you would typically use, in an effective and explicit way.

Criterion D: Discussion and Evaluation

Guiding question: *Does the student discuss the findings and evaluate the essay?*

	Discussion	Evaluation
7-8 marks	A balanced discussion of the significance of the findings is fully supported by appropriate evidence.	An evaluation of the effectiveness of the essay is present, with relevant strengths and limitations explained.
5-6 marks	A balanced discussion of the significance of the findings is often supported by appropriate evidence.	An evaluation of the effectiveness of the essay is present, with relevant strengths and limitations described.
3-4 marks	A partially balanced discussion of the significance of the findings is sometimes supported by appropriate evidence.	An evaluation of the effectiveness of the essay is present, with some strengths and limitations stated.
1-2 marks	The significance of the findings is described, but there is no reference to supporting evidence.	A partial evaluation of the effectiveness of the essay is present, but strengths and limitations are not stated.
0 marks	If the work does not reach a standard outlined by the performance level descriptors above, 0 marks are awarded for this criterion.	

Subject Specific Guidance (specific to Language A: English essays)

Clearly discuss the relevance of your findings throughout the essay, not just in the conclusion. Consider the strengths of what you have found and describe any limitations. In more practical essays, discuss the findings from your data and ensure this informs how you proceed through the essay. In more theoretical essays, explain how the theory you are developing is relevant to your research question. In both cases, ensure that the conclusions you reach are relevant to your research question and are supported by findings in your essay.

General Guidance (general guidance shared across all subject essays)

Discussion

To demonstrate your discussion skills, you need to offer a considered and balanced review of the significance of your research findings that includes a range of factors or perspectives. Opinions or conclusions should be presented clearly and supported by appropriate evidence. Compelling arguments are developed through thoughtful analysis of the evidence obtained from research.

Evaluation

As a discerning author of an extended essay, it is important to evaluate the effectiveness of your essay by appraising your research materials, weighing up their strengths and limitations. This includes being aware of the stated or implied positions and views of the writers. Evaluation goes hand in hand with discussion and feeds into your line of argument as you work your way towards showing the reader that you have reached a well-founded conclusion. The intention is not to have a separate “evaluation” section, but rather to integrate it throughout your essay.

Criterion E: Reflection

Guiding question: *Does the student evaluate the effect of the extended essay learning experience on them as a learner?*

Note: Criterion E only applies to the reflective statement on the student's RPF.

Evidence referred to in the reflection may be drawn from, but is not limited to:

- Experiences and insights that could shape future thinking
- Explicit examples of how skills learned could be used in other current contexts and in the future
- How changes in perspective impacted decision making

	Evaluative	Growth
4 marks	Reflection on the extended essay learning experience is consistently evaluative and includes specific examples.	Reflection consistently shows evidence of the student's growth and transfer of learning.
3 marks	Reflection on the extended essay learning experience is partially evaluative and includes specific examples.	Reflection often shows evidence of the student's growth and transfer of learning.
2 marks	Reflection on the extended essay learning experience is descriptive and includes some specific examples.	Reflection sometimes shows evidence of the student's growth and transfer of learning.
1 mark	Reflection on the extended essay learning experience is descriptive.	Reflection on the student's growth is limited to a description of the process and there is no evidence of transfer of learning.
0 marks	If the work does not reach a standard outlined by the performance level descriptors above, 0 marks are awarded for this criterion.	

General Guidance (general guidance shared across all subject essays)

Evaluative

As you reflect on your extended essay experience, to be evaluative you need to consider the value of its impact on you as a learner. Give explicit examples of how you have transferred the skills you have learned to apply them in other contexts.

Growth

To reflect on your growth as a consequence of doing the extended essay, consider these questions: How did changes in perspective impact your decision-making? How might your experiences and insights shape your future thinking, including how you envisage transferring the skills and lessons you have learned to other circumstances, such as future studies, career or life in general?