



INTERNATIONAL BACCALAUREATE ORGANIZATION

DIPLOMA PROGRAMME

The extended essay

For first examinations in 1999

The Extended Essay
April 1998

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International Baccalaureate Organisation
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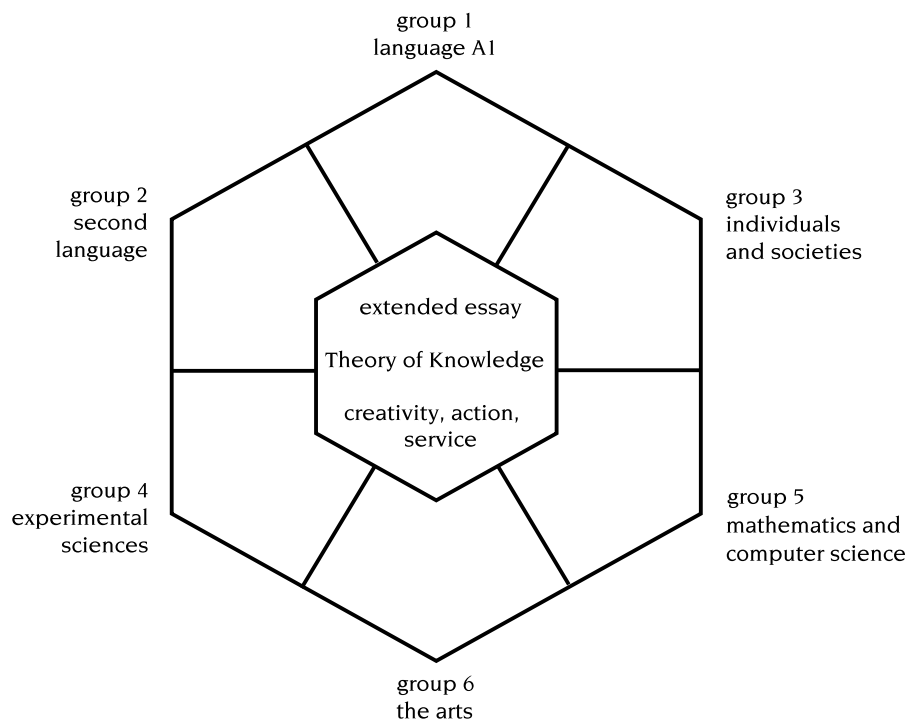
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INTRODUCTION

The International Baccalaureate Diploma Programme is a rigorous pre-university course of studies, leading to examinations, that meets the needs of highly motivated secondary school students between the ages of 16 and 19 years. Designed as a comprehensive two-year curriculum that allows its graduates to fulfil requirements of various national education systems, the diploma model is based on the pattern of no single country but incorporates the best elements of many. The programme is available in English, French and Spanish.

The curriculum is displayed in the shape of a hexagon with six academic areas surrounding the core. Subjects are studied concurrently and students are exposed to the two great traditions of learning: the humanities and the sciences.



Diploma candidates are required to select one subject from each of the six subject groups. At least three and not more than four are taken at higher level (HL), the others at standard level (SL). HL courses represent 240 teaching hours; SL courses cover 150 hours. By arranging work in this fashion, students are able to explore some subjects in depth and some more broadly over the two-year period; this is a deliberate compromise between the early specialization preferred in some national systems and the breadth found in others.

Distribution requirements ensure that the science-orientated student is challenged to learn a foreign language and that the natural linguist becomes familiar with laboratory procedures. While overall balance is maintained, flexibility in choosing higher level concentrations allows the student to pursue areas of personal interest and to meet special requirements for university entrance.

Successful diploma candidates meet three requirements in addition to the six subjects. The interdisciplinary Theory of Knowledge (TOK) course is designed to develop a coherent approach to learning which transcends and unifies the academic areas and encourages appreciation of other cultural perspectives. The extended essay of some 4000 words offers the opportunity to investigate a topic of special interest and acquaints students with the independent research and writing skills expected at university. Participation in the school's creativity, action, service (CAS) programme encourages students to be involved in sports, artistic pursuits and community service work.

The extended essay is an intrinsic part of the IB diploma. The purpose of the requirements and procedures presented in this guide is to ensure that:

- all candidates and teachers fully understand the challenge presented by the extended essay
- the degree of challenge is equivalent for all candidates
- the extended essay makes appropriate demands on candidates
- there is parity in the assessment of extended essays within a subject
- extended essays of similar quality in different subjects receive the same reward
- the reward is appropriate to the quality of the extended essay.

The assessment criteria for extended essays contained in this guide have emerged from consultation with experienced IB teachers and examiners. They incorporate changes introduced in 1997 to take effect **from the examinations for May 1999**.

Intellectual Property Rights

All examinations, papers, scripts, documents, materials, programs, films, audiotapes, videotapes, photographs, drawings, data, plans, artwork and designs in any form whatsoever prepared and produced by candidates and submitted to the International Baccalaureate Organisation (IBO) for marking, moderation and/or assessment purposes shall upon such submission to the IBO become the absolute property of the IBO.

REGULATIONS

For a diploma to be awarded, all these regulations must be complied with.

Regulation 1 – The Requirement

Every IB diploma candidate must submit an extended essay. Extended essays may only be submitted by candidates in the diploma and retake categories. Retake candidates may submit either a new extended essay for assessment, registered in the same or a different subject, or a revised extended essay.

Regulation 2 – Supervision

It is the school's responsibility to ensure that each candidate submitting an extended essay is supervised by a teacher at the school with appropriate qualifications and/or experience in the subject chosen by the candidate. The teacher providing this supervision is referred to as the candidate's extended essay supervisor and must not be related to the candidate. (See pages 5 and 6, *Supervision* for further details.)

Regulation 3 – Language of the Essay

Extended essays submitted in a group 1 or group 2 language must be written in that language. Extended essays in all other subjects must be written in English, French or Spanish.

Regulation 4 – Malpractice

The IBO defines malpractice as the attempt by a candidate to gain an unfair advantage in any assessment component. Collusion is when a candidate knowingly allows his or her work to be submitted for assessment by another candidate. Plagiarism is defined by the IBO as the submission for assessment of the unacknowledged work, thoughts or ideas of another person as the candidate's own.

In order to avoid charges of plagiarism, candidates must always ensure that they acknowledge fully and in detail the words and/or ideas of another person. The same piece of work, or two versions of the same work, cannot be submitted to meet the requirements of both the extended essay and another assessment component of a subject contributing to the diploma.

Regulation 5 – Choice of Subject

The list of available subjects and languages for extended essays is given in the *Vade Mecum*. If a candidate wishes to submit an extended essay for group 1 in any language not on this list, the school must obtain permission from IBCA by the date given in the *Vade Mecum*. Refer to the subject guidelines for group 1 and group 2 for an explanation of the nature of an extended essay in each of these subject areas.

The IB subject chosen for the extended essay does not have to be one of the subjects being studied by the candidate for the diploma.

Extended essays cannot be submitted in a school-based syllabus, Theory of Knowledge or a pilot programme, except for those cases given in the list in the *Vade Mecum*.

A language A1 SL self-taught candidate normally may not offer an extended essay in his/her language A1.

Candidates are not allowed to submit a group 2 extended essay in a language which they are offering as a language A1 in their diploma.

Extended essays submitted for assessment in a subject for which they are not registered may not be assessed.

SUPERVISION

The extended essay supervisor has four principal responsibilities:

- to encourage and support the candidate throughout the research and writing of the extended essay
- to provide the candidate with advice and guidance in the skills of undertaking research
- to ensure that the extended essay is the candidate's own work
- to complete the supervisor's report.

The supervisor should help candidates understand the relative importance of the extended essay in the overall context of the diploma. It is recommended that candidates spend about 40 hours in total on the extended essay. Since candidates will be faced with many other commitments during the Diploma Programme, the demands of the extended essay may appear daunting at times. An important role of the supervisor is to offer encouragement, support and reassurance during the preparation and writing of the extended essay.

The amount of time spent by the supervisor with each candidate will vary depending on the circumstances, but will usually be between two and three hours in total. To help candidates organize the time they spend on the extended essay, schools are encouraged to set internal deadlines for important stages in writing the extended essay. A schedule of stages will permit supervisors to maintain close contact with the candidates and may include: selecting the subject; deciding on the topic; formulating the research question; completing the research; drafting a rough copy; and submitting the final version.

The supervisor must ensure that the candidate is thoroughly conversant with all the pertinent information in this guide. The supervisor must provide advice and guidance appropriate to the particular requirements of the candidate, including assistance with:

- defining a suitable topic
- formulating a precise research question
- access to appropriate resources (such as people, a library, a laboratory)
- techniques of gathering and analysing information/evidence/data
- documentation methods for acknowledging sources
- writing an abstract.

While the supervisor is encouraged to discuss the choice of topic and research question with the candidate, the candidate must be allowed to decide on the topic and the research question and develop his/her own ideas. The supervisor must ensure that the chosen research question satisfies appropriate legal and ethical standards with regard to health and safety, confidentiality and human rights, and animal welfare and environmental issues. Further information about such issues is given in the relevant subject guidelines.

The supervisor is encouraged to read and comment on the first draft of the extended essay, but is not permitted to edit this draft for the candidate. It is the candidate's responsibility to correct mistakes and verify the accuracy of the contents of the extended essay.

The supervisor is responsible for ensuring that a completed extended essay cover accompanies the final version of the extended essay. If the extended essay cover is not signed by either the candidate or the supervisor, the essay will not be accepted for assessment and may be returned to the school. The supervisor must complete the supervisor's report on the inside of the cover and submit the extended essay in its cover to the IB coordinator.

The supervisor is responsible for ensuring that the extended essay is the candidate's own work, by monitoring the progress of the essay. In addition, the supervisor should read the final version of the extended essay. If the supervisor suspects that malpractice, such as plagiarism, has occurred, he/she must write a full report outlining the reasons for suspicion. The supervisor should present this report to the IB coordinator who will then follow the appropriate procedures.

It may be necessary for the candidate to consult an external resource person during the research. This is permissible but it is the responsibility of the candidate's extended essay supervisor within the school to complete all the formalities described above.

GENERAL GUIDELINES

The Nature of the Extended Essay

The extended essay is defined as an in-depth study of a limited topic within a subject. Its purpose is to provide candidates with an opportunity to engage in independent research. Emphasis is placed on the process of engaging in personal research, on the communication of ideas and information in a logical and coherent manner, and on the overall presentation of the extended essay in compliance with these guidelines. Many of these general issues, such as the way in which information is handled, the level of analysis and the quality of argument, are assessed through the general assessment criteria. This is reflected in the relative weighting of 2:1 between the general and subject assessment criteria.

The Choice of Subject

The subject in which the extended essay is registered must be chosen from the list of available subjects given in the *Vade Mecum*.

It is advisable to choose the subject for the extended essay before deciding what the topic or research question of the extended essay will be. Since the IBO specifies the range of permitted subjects, certain topics may not be appropriate for an extended essay.

The subject chosen for the extended essay does not have to be one of the subjects being studied by the candidate for the diploma, but care should be taken to choose a subject about which the candidate has sufficient knowledge and skills.

Candidates should also base the choice of subject on the level of personal interest they have in that subject.

Preparing the Essay

The Choice of Topic

The topic of the extended essay is the particular area of study within the chosen subject. Before a final decision is made about the choice of topic the relevant subject guidelines should be carefully considered.

Candidates should aim to choose a topic that is both interesting and challenging to them. The topic chosen should be limited in scope and sufficiently narrow to allow candidates to examine an issue or problem in depth. It should present the candidate with the opportunity to collect or generate information and/or data for analysis and evaluation. Candidates are not expected to make a contribution to knowledge within a subject.

A broad topic is unlikely to result in a successful extended essay. A topic which requires no personal research and/or requires an essentially narrative or descriptive approach is not suitable for an extended essay. Similarly, although a reliance on secondary sources is sometimes necessary, an extended essay which only provides a summary of such sources will not be successful. Writing a précis of a well-documented topic is unlikely to result in a successful extended essay.

The Research Question

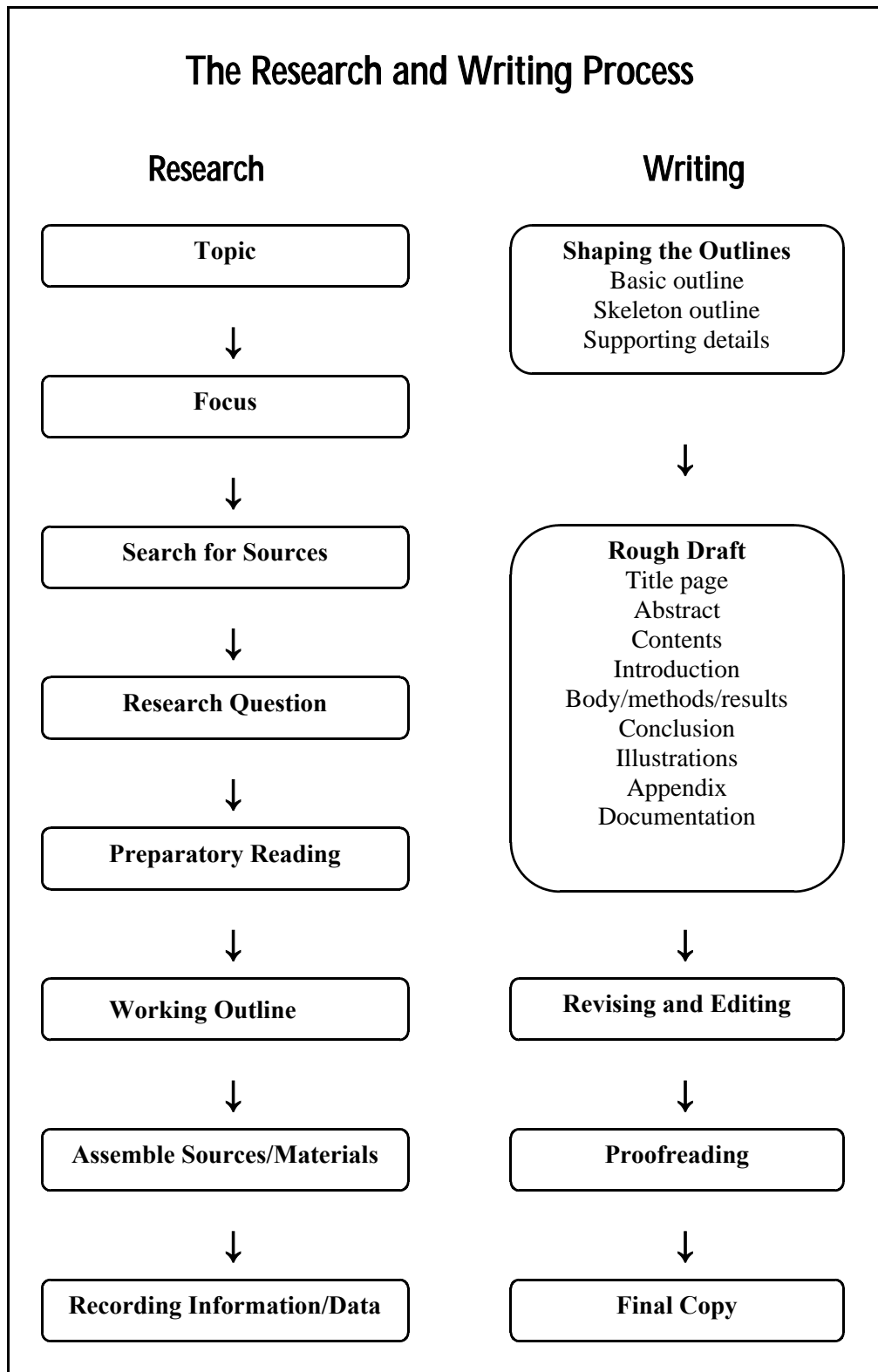
When an appropriate topic has been chosen, candidates should narrow the focus of the investigation and formulate a specific research question. For many extended essays this will be phrased in the form of a question, but alternatives such as launching the investigation with a hypothesis are acceptable. By frequently referring to this research question, candidates should be able to maintain the purpose and orientation of the investigation.

Candidates are encouraged to formulate a challenging research question but to ensure that it can be explored within the constraints of essay length, time and resources available to them.

The Research Process

Owing to the diversity of subjects and the different approaches to research, this guide does not offer detailed advice on the methods and skills of research. However, a systematic process, shaped by the nature of the subject, is essential to generate and gather information and ideas that can be used to develop a convincing answer to the specified research question.

The following diagram is intended to provide a model for the process of conducting the research and writing the extended essay.



Organizing the Essay

After careful outlining and drafting, it is likely that the majority of extended essays will follow a structure similar to that described below.

Introduction

The introduction should include:

- an indication of why the topic chosen is interesting, important or worthy of study
- some background information and an attempt to place the topic in an appropriate context
- an indication of whether the topic has been narrowed to a focus of more manageable proportions
- a clearly and precisely stated research question
- a clear concluding statement of the thesis and argument, i.e. the response to the research question that will subsequently be developed in the body of the essay.

Body/Development

The essential feature of the major section, or body, of the essay is the systematic development of a convincing answer to the research question. The structure and the approach to this section will be shaped by the conventions of the particular subject in which the extended essay is being undertaken. Some subjects may require sub-headings for major sections within the main body. For example, scientific investigations will usually have separate sections for method and results. In some other subjects, however, sub-headings should be avoided because they disrupt the flow and unity of an essay.

Conclusion

The requirements of the conclusion are that it

- is clearly stated
- is relevant to the research question being investigated
- is substantiated by the evidence presented
- indicates issues, unresolved questions and new questions that have emerged from the research.

Formal Presentation

The extended essay should be written in a clear, correct and formal style appropriate to the subject from which the topic is drawn. The use of typewriters or word processors is encouraged.

The Length of the Extended Essay

The upper limit is 4000 words for all extended essays. This upper limit includes the introduction, the body, the conclusion and any quotations, but does **not** include:

- the abstract
- acknowledgements
- the contents page
- maps, charts, diagrams, annotated illustrations and tables
- the references/bibliography
- appendices.

Essays in excess of 4000 words are subject to penalties and examiners are not required to read material in excess of the word limit.

Candidates writing their extended essay in Japanese or Chinese should use the following conversions:

Japanese:	1 word = approximately 2 Japanese characters
Chinese:	1 word = approximately 1.2 Chinese characters

Title

The title should provide a clear indication of the focus of the essay. It should be precise and not necessarily phrased in the form of a question.

Abstract

An abstract not exceeding 300 words must be included. It does not serve as an introduction but presents a synopsis of the extended essay, and therefore should be written last.

The inclusion of an abstract is intended to encourage candidates to examine closely the development of an argument within the extended essay and the pertinence of any conclusions that are reached. It is also designed to allow readers to understand quickly the contents of the extended essay.

The minimum requirements for the abstract are to state clearly:

- the research question being investigated
- the scope of the investigation
- the conclusion/s of the extended essay.

The abstract should be typed or word processed on one side of a sheet of paper, and placed immediately after the title page.

Contents Page

A contents page must be provided at the beginning of the extended essay and all pages should be numbered. An index is not required.

Illustrations

Presentation and overall neatness are important, and it is essential that illustrative material, if included, is well set out and used effectively. Graphs, diagrams, tables and maps are effective only if they are well labelled and can be interpreted with ease. All such material which is incorporated into the extended essay must be directly related to the text and acknowledged where appropriate. The use of photographs and postcards is acceptable only if they are captioned and/or annotated and are used to illustrate a specific point made in the extended essay.

References/Bibliography

The direct or indirect use of the words of another person, written, oral or electronic, must be acknowledged appropriately as must visual material in the essay, derived from another source. A candidate's failure to comply with this requirement will be viewed as plagiarism, and will therefore be treated as a case of malpractice.

The bibliography or list of references should include only those works, such as books and journals, that have been consulted by the candidate. An accepted form of quoting and documenting sources, should be applied consistently. The major documentation systems are divided into two groups, parenthetical in-text systems and numbered systems; either may be used, provided this is done consistently and clearly. It is good practice to require candidates to study a major style guide appropriate to the subject of the extended essay so that they can present their list of references professionally.

Each work consulted, regardless of whether or not it has already been cited as a reference, must be listed in the bibliography. The bibliography should specify: author/s, title, date and place of publication, and the name of the publisher, following consistently one standard method of listing sources. Possible examples are:

Peterson, A. D. C. *Schools Across Frontiers: the story of the International Baccalaureate and the United World College*. La Salle, Illinois: Open Court, 1987.

Peterson, A. D. C. (1987), Schools Across Frontiers: the story of the International Baccalaureate and the United World College, Open Court: La Salle, Illinois.

Institute for Aerospace Research (IAR). Flight Research. In *National Research Council of Canada (NRC)* [online]. 1996 [cited 1996-07-11]. Available from World Wide Web: <URL: http://www.iar.nrc.ca/iar/fr_general-e.html>

Zieger, Herman E. "Aldehyde." *The Software Toolworks Multimedia Encyclopedia*. Vers. 1.5. Software Toolworks. Boston: Grolier, 1992.

Bruckman, Amy S. "MOOSE Crossing Proposal." mediamoo@media.mit.edu (20 Dec. 1994).

Note that, for personal e-mail listings, the address should be omitted.

Appendices

Appendices are not an essential section of the extended essay and examiners are not required to read them, so care should be taken to include all information of direct relevance to the analysis and argument in the main part of the essay. Unless considered essential, complete lists of raw data should not be included in the extended essay.

An extended essay should not constantly refer to material presented in an appendix as this may disrupt its continuity.

The Use of Other Media and Materials

Apart from graphic material, materials in other media may be submitted only as supporting appendices and should not detract from the written extended essay.

Computers

The use of computers is encouraged where they are appropriate as tools for analysing data relevant to the subject of the extended essay. Material such as a hard copy of computer output may be included in the extended essay, but any associated program should be referred to or reproduced, if original, only as an appendix.

Only in computer science and physics (in particular circumstances) may programs be included as part of the extended essay. (See subject guidelines for *Computer science*, page 57, and for *Physics*, page 108 for further details.)

Videotapes

The use of videotapes as supporting material is **not** permissible.

Audiotapes

The use of audiotapes as supporting material is permissible, but is not encouraged, and extra merit will not be given for the inclusion of audiotapes in support of an extended essay. Digital audiotapes are **not** acceptable.

Specimen Materials

Specimen materials used in or produced by investigations do not form part of the extended essay and must **not** be submitted. Photographic evidence may be submitted in place of such material.

ASSESSMENT OF EXTENDED ESSAYS

Use of Assessment Criteria

All extended essays are externally assessed by examiners appointed by the IBO. All extended essays are marked on a scale from 0 to 36. This maximum score is made up of the total criterion levels available for each essay, and is divided between general and subject assessment criteria in the ratio 2:1. Criterion levels will be awarded to each extended essay using a **best match model**. For each criterion, examiners are instructed to identify the level descriptor that is most appropriate (i.e. the best match) for the extended essay under consideration, rather than to progress upwards through the levels until the essay fails to meet one or more aspects of the descriptor. The best match model will be used for both the general assessment criteria and the subject assessment criteria.

General Assessment Criteria

There are eight general assessment criteria. These are concerned with how candidates manage general aspects of the extended essay, such as the writing of the abstract and conclusion, the use of information and data, and the overall presentation.

For each of the general assessment criteria, different degrees of quality are described by a set of achievement level descriptors. Some of the criteria are more important than others and have more achievement levels. The general quality of an extended essay is measured by adding together the achievement levels attained on each of the eight general assessment criteria. An extended essay may score up to 24 on the general assessment criteria.

Inappropriate Research Questions

General assessment criteria A, C and D refer to inappropriate research questions, which fall into two main types. There are some research questions which are too broad in scope to be dealt with effectively, on more than a superficial descriptive level, within the limits of an extended essay. Many examples of such research questions are given in the subject guidelines. Such research questions will not achieve greater than level 1 on criterion A, and may well fail to successfully address some of the other general and subject assessment criteria.

The other category of inappropriate research question involves those studies which are too simplistic, too limited in scope or too speculative, providing either an easily accomplished or insignificant outcome, or a self-evident outcome which should have been predicted in advance. Such extended essays will be awarded a level 0 on criterion A and, because they can in theory satisfy the requirements of criteria C and D with some ease, they will be restricted to a maximum of level 2 in both these cases.

Examples of the second category of research question, which are defined as not lending themselves to systematic investigation in the context of an extended essay, are:

Biology	<i>How is photosynthesis affected by the absence of light?</i>
Biology	<i>What causes genetic diseases?</i>
Classical languages	<i>The frequency of the ablative absolute construction in Cicero's first Catalinarian speech.</i>
Computer science	<i>How to buy a CD using the Internet.</i>
Environmental systems	<i>The annual net productivity of a pet gerbil.</i>
Geography	<i>The potato – areas of cultivation and the uses of the potato.</i>
Geography	<i>Does Sydney have a central business district?</i>
History	<i>Why did the Emperor Claudius have a limp?</i>
History	<i>Would the native people of North America have won the frontier wars if they had first invented firearms?</i>
History	<i>Tracing human evolution in the Rift Valley in Africa to extraterrestrial origins.</i>
Mathematics	<i>The duodecimal system.</i>
Social anthropology	<i>Is it possible to analyse the culture of San X apart from by its sculpture? (when it is soon apparent that nothing else is known about the culture except the sculptures from this pre-Columbian archeological site)</i>
Theatre arts	<i>An investigation into whether stage lighting has an effect.</i>

It is important to note that judgement on the suitability of the above research questions could not be made on the basis of the title alone. Some research questions which appear trivial from the title may be given a sophisticated treatment and produce worthy findings. Thus, although the title of the extended essay may act as a guide, decisions about the awarding of criteria levels in regard to this matter can only be made on the basis of the whole essay.

Subject Assessment Criteria

The subject assessment criteria are concerned with how candidates manage the chosen topic within the context of the subject in which the extended essay is registered.

Each subject has its own set of assessment criteria. Each extended essay will be assessed against the subject assessment criteria for the subject in which it is registered.

For each of the subject assessment criteria, different degrees of quality are described by a set of achievement levels. As for the general assessment criteria, some of the criteria may be more important than others and so may have more achievement levels. The subject quality of an extended essay is measured by adding together the achievement levels attained on each of the subject assessment criteria. An extended essay may score up to 12 on the subject assessment criteria.

An extended essay which is inappropriate to the subject in which it is submitted will score zero on the subject assessment criteria.

Overall Assessment

The total score obtained, on the scale 0 to 36, will be used to determine in which of the following bands the extended essay is placed. This band, in conjunction with the band for Theory of Knowledge, determines the diploma points awarded for these two requirements. See *Award of Diploma Points* below for further details.

The band descriptions are:

- A Work of an excellent standard
- B Work of a good standard
- C Work of a satisfactory standard
- D Work of a mediocre standard
- E Work of an elementary standard

The band description provides the basis of reporting back to schools on each candidate's performance in the extended essay requirement.

Award of Diploma Points

The extended essay contributes to the overall diploma score through the award of points in conjunction with Theory of Knowledge. A maximum of three points are awarded according to a candidate's combined performance in both the extended essay and Theory of Knowledge.

Both Theory of Knowledge and the extended essay are measured against published assessment criteria. According to the quality of the work, based on the application of these assessment criteria, a candidate's performance in each of the extended essay and Theory of Knowledge will fall into one of the five bands described above.

The total number of points awarded is determined by the combination of the performance levels achieved by the candidate in both the extended essay and Theory of Knowledge according to the matrix on the following page.

GENERAL ASSESSMENT CRITERIA

These general assessment criteria are applicable to all extended essays, irrespective of the subject in which the extended essay is registered. However, each extended essay will be assessed against these criteria in the context of the subject in which the extended essay is registered.

The criteria given in this guide will first be used in the 1999 examination sessions.

A Research question

The extent to which the focus of the essay is expressed and specified. This need not be in the form of a question. An example of an alternative form is a hypothesis.

Achievement level

- | | |
|---|---|
| 0 | The research question is not stated in the early part of the essay or does not lend itself to systematic investigation in the context of an extended essay. |
| 1 | The research question is stated in the early part of the essay but not in a precise manner or the research question is clearly and precisely stated but is too broad in scope to be treated effectively within the word limit. |
| 2 | The research question is clearly and precisely stated in the early part of the essay and is sharply focused, making it susceptible to effective treatment within the word limit. |

Levels will be awarded for the remaining criteria regardless of whether the research question is clearly stated or implicit.

B Approach to the research question

The extent to which the essay appropriately addresses and develops the specific research question, including the collection of any relevant information.

Achievement level

- | | |
|---|---|
| 0 | The approach used is completely inappropriate to the research question. |
| 1 | The approach used is generally inappropriate to the research question. |
| 2 | The approach used is generally appropriate to the research question. |
| 3 | The approach used is well chosen and highly appropriate to the research question. |

C Analysis/interpretation

The extent to which relevant materials, sources, data and evidence are considered appropriately in the essay. Where the research question does not lend itself to systematic investigation in the context of an extended essay, the maximum level that can be awarded is 2.

Achievement level

- 0** There is no attempt at analysis/interpretation.
- 1** There is some attempt at analysis/interpretation.
- 2** Analysis/interpretation is carried out but not always thoroughly or correctly.
- 3** A competent analysis/interpretation is carried out.
- 4** An effective analysis/interpretation is carried out with skill and understanding.

D Argument/evaluation

The extent to which the essay develops an argument relevant to the research question from the materials/information considered. Where the research question does not lend itself to systematic investigation in the context of an extended essay, the maximum level that can be awarded is 2.

Achievement level

- 0** There is no argument relevant to the research question.
- 1** There is a limited or superficial attempt to formulate an argument relevant to the research question.
- 2** An argument is developed which addresses the research question but which is incomplete. Where an evaluation is appropriate, it is likely to be subjective, with little attempt at substantiation.
- 3** An argument which addresses the research question is competently developed. Where an evaluation is appropriate, some attempt has been made to substantiate it.
- 4** A convincing argument, which addresses the research question, is well developed, well organized and clearly expressed. Where an evaluation is appropriate, it is fully substantiated.

E Conclusion

The extent to which the essay incorporates a conclusion consistent with its argument, not necessarily in the form of a separate section.

Achievement level

- 0** Little or no attempt has been made to provide a conclusion which is consistent with the argument presented in the essay.
- 1** Some conclusion is attempted which is consistent with the argument presented in the essay.
- 2** A conclusion is clearly stated, is relevant to the research question and is consistent with the argument or explanation presented in the essay. Where appropriate, the conclusion clearly indicates unresolved questions and new questions that have emerged from the research.

F Abstract

The adequacy of the formal abstract as a synopsis of the essay.

Achievement level

- 0** The abstract exceeds 300 words **or** one or more of the following is/are missing: the research question; the scope of the investigation; the conclusion reached.
- 1** Within the abstract, the research question, the scope of the investigation and the conclusion reached are all present but not all clearly stated.
- 2** Within the abstract, the research question, the scope of the investigation and the conclusion reached are all clearly stated.

G Formal presentation

The layout, table of contents, references, bibliography, appendices, title, quotations, illustrations and organization, where appropriate. General descriptors of the different achievement levels can be found on the following page.

Achievement level

- 0** The essay exceeds 4000 words **or** the formal presentation of the essay is poor.
- 1** The formal presentation of the essay is adequate.
- 2** The formal presentation of the essay is good.
- 3** The formal presentation of the essay is excellent.

G Formal presentation (general descriptors)

Achievement level 0

The essay exceeds 4000 words **or** the overall presentation and neatness of the essay are poor. Illustrative material, if included, is untidy and not used effectively. A contents page or list of section/chapter headings, if included, is not clearly set out. The pages are not numbered. References (if appropriate) are not set out consistently, according to a standard format. The bibliography (if appropriate) clearly omits some works of reference used and/or does not specify author/s, title, date of publication and publisher in a standard or consistent way. The appendix (if appropriate) is poorly presented, not selective and contains redundant information/data.

Achievement level 1

The essay is within 4000 words. The overall presentation and neatness of the essay are adequate. Illustrative material, if included, may on occasions be untidy and not used effectively. A contents page or list of section/chapter headings is provided, but may not be clearly set out. The pages may not be numbered. References (if appropriate) may not be set out consistently, according to a standard format. The bibliography (if appropriate) appears to include most works of reference used but it does not specify author/s, title, date of publication and publisher in a standard or consistent way. The appendix (if appropriate) contains more information/data than is necessary in support of the text.

Achievement level 2

The essay is within 4000 words. The overall presentation and neatness of the essay are good. Illustrative material, if appropriate to the essay, is well set out and in most cases used effectively. A contents page or list of section/chapter headings is provided and clearly set out. All pages are numbered. References (if appropriate) are set out consistently, according to a standard format. The bibliography (if appropriate) appears to include most works of reference used and it specifies author/s, title, date of publication and publisher following one standard method of listing sources. The appendix (if appropriate) contains information/ data that is required in support of the text.

Achievement level 3

The essay is within 4000 words. The overall presentation and neatness of the essay are excellent. Illustrative material, if appropriate to the essay, is well set out and used effectively. A contents page or a list of section/chapter headings is provided and clearly set out. All pages are numbered. References (if appropriate) are set out consistently, according to a standard format. The bibliography (if appropriate) appears to include all, and only, those works of reference which have been consulted by the candidate and it specifies author/s, title, date of publication and publisher following consistently one standard method of listing sources. The appendix (if appropriate) contains only information/data that is required in support of the text.

H **Holistic judgement**

An overall assessment of qualities such as personal engagement, initiative, depth of understanding, insight, inventiveness and flair. Achievement levels 0, 1, 2, 3 or 4 will be determined by the examiner based on the extent to which these qualities are demonstrated in the essay. The supervisor's report may also be taken into account.

Achievement level

0 The essay is judged to be routine and to show little evidence of any of the qualities listed above.

4 The essay is judged to be outstanding with regard to qualities such as those listed above.

SUBJECT GUIDELINES AND SUBJECT ASSESSMENT CRITERIA

GROUP 1

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

The group 1 extended essay is intended for native speakers (i.e. candidates who could offer the language in question as a language A1). The essay must be written in the language for which it is registered. Candidates studying a group 2 language who are interested in writing about the literature of that language should read *Group 2*, pages 32-37. It is intended that candidates should not submit a group 1 extended essay in their group 2 language.

A group 1 extended essay provides candidates with an opportunity to:

- study intensively a literary topic which is suitable in nature and scope for discussion in this form
- engage in personal critical judgement of literature and to compare this, where appropriate, with established critical comment
- develop the ability to put forward their views persuasively and in a well-structured manner, using a register appropriate to the study of literature.

Creative writing and essays based on language, culture and/or society topics are not currently permissible as group 1 extended essays.

Choice of Topic

A group 1 extended essay should be based on one of the two categories below.

Category 1

The essay should be based on the literature of countries where the language is spoken (i.e. all works discussed will originally have been written in the language of the essay).

The following are some examples for guidance only:

English: *Clergymen in Jane Austen's novels.*

English: *A comparison of Aldous Huxley's 'Brave New World' and George Orwell's '1984'.*

Spanish:	<i>Colour symbolism in the poetry of Antonio Machado.</i>
Danish:	<i>Perceptions of nature in Danish poetry of the 1890s.</i>
Italian:	<i>Town and country in the works of Cesare Pavese.</i>
Italian:	<i>The theme of the nest in the poetry of Giovanni Pascoli.</i>
English:	<i>The nature and role of comedy in selected plays by Wole Soyinka.</i>

Category 2

The essay should be a comparison of at least one literary work originally written in the language of the essay with a literary work or works originally written in a different language to that of the essay and probably studied in translation.

The following are some examples for guidance only:

English/French/German:	<i>The portrayal of Joan of Arc by Shaw, Anouilh and Schiller.</i>
English/German:	<i>A comparison of Gay's 'The Beggar's Opera' and Brecht's 'The Threepenny Opera'.</i>
French/Russian:	<i>In what ways do the male authors of 'Anna Karenina' and 'Madame Bovary' seek to render their heroines sympathetic to the reader? How far do they succeed?</i>
English/French/Japanese:	<i>The presentation of innocence in 'Joseph Andrews', 'Candide' and 'Wonderful Fool'.</i>
Italian/English:	<i>Themes and stylistic devices from Dante in T S Eliot's 'Wasteland' and 'Four Quartets'.</i>
English/French:	<i>Portraits of poverty in the 19th century: a comparison of 'Nana' by Zola and 'Little Dorrit' by Dickens.</i>

The topic chosen must be **literary** in nature and could be a particular aspect, or comparative study, of a work or works, author, period or genre.

The extended essay may relate to work studied in class but candidates must take care in all cases to demonstrate relevant wider reading and individual study.

Appropriate literary works may be chosen from any source; candidates need not restrict themselves to works on the IB prescribed book list (PBL) for the language of the essay.

The following examples of titles for group 1 extended essays are intended for guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

English:	<i>Religious imagery in 'Wuthering Heights' is better than The Brontës.</i>
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English:	<i>The problems of racial conflict as shown through the works of James Baldwin is better than Racial conflict in the 20th century.</i>
French:	<i>The portrayal of women in the works of Zola is better than The works of Zola.</i>
French:	<i>Existentialism in 'Les Mains Sales' and 'Les Mouches' by Sartre is better than What is existentialism?</i>
Spanish:	<i>The treatment of social conflict in 'La Busca' by Pío Baroja is better than Social conflict in modern literature.</i>

Treatment of the Topic

Literary works often address, for example, philosophical, political or social questions. However, the major focus of the essay should be the literary treatment of such questions. The literary works should not be a pretext for interdisciplinary study.

Candidates should not use the extended essay solely as a vehicle for their own thoughts but, after providing careful analysis of the author's ideas, should present their personal views on the way the author has treated the subject. There should be a compromise between building on the wisdom of more experienced critics and introducing new personal elements. The mere reiteration of the views of established literary critics will not result in a successful extended essay.

In the writing of the essay, candidates must bear in mind that any narrative and/or descriptive material included should be directly relevant to the critical analysis. A précis of the candidate's reading is not sufficient.

Assessment Criteria

J Knowledge and understanding of the literature studied and, where appropriate, reference to secondary sources

Where the essay is based solely on works originally written in a language other than the language of the essay, level 0 will be awarded.

Achievement level

- | | |
|----------|---|
| 0 | The candidate demonstrates no real knowledge or understanding of the literature studied. |
| 1 | The candidate demonstrates some knowledge but little understanding of the literature studied. References to the literary work/s are irrelevant or insufficient. The candidate makes infrequent references to secondary sources, where it would be appropriate. |
| 2 | The candidate demonstrates an adequate knowledge and some understanding of the literature studied. References to the literary work/s are generally relevant but may not be sufficient. Where appropriate, the candidate makes some references to secondary sources. |
| 3 | The candidate demonstrates a good knowledge and understanding of the literature studied. References to the literary work/s are relevant and sufficient. Where appropriate, the candidate makes relevant references to secondary sources. |
| 4 | The candidate demonstrates a very good knowledge and understanding of the literature studied. References to the literary work/s are highly relevant and sufficient. Where appropriate, the candidate makes relevant references to secondary sources. |

K Personal response justified by literary judgement and/or analysis

Where the essay is based solely on works originally written in a language other than the language of the essay, level 0 will be awarded.

Achievement level

- 0** The candidate makes no personal response to the literature studied **or** the response is never justified and only personal views are expressed.
- 1** The candidate makes little personal response to the literature studied **or** the response is rarely justified.
- 2** The candidate's personal response to the literature studied is partly justified by literary judgement and/or analysis.
- 3** The candidate's personal response to the literature studied is generally justified by literary judgement and/or analysis.
- 4** The candidate's personal response to the literature studied is fully justified by literary judgement and/or analysis.

L Use of language appropriate to a literary essay

Achievement level

- 0** The language is inaccurate and unclear. The register and vocabulary used are generally inappropriate to the discussion of literature.
- 1** The candidate writes with some degree of linguistic accuracy. The register and vocabulary used are only partly appropriate to the discussion of literature.
- 2** The candidate generally writes with linguistic precision, coherence and fluency, with only a few lapses. The register and vocabulary used are generally appropriate to the discussion of literature.
- 3** The candidate writes with linguistic precision, coherence and fluency. The register and vocabulary used are appropriate to the discussion of literature.
- 4** The candidate writes with linguistic precision, coherence, fluency, conciseness and clarity. The register and vocabulary used are highly appropriate to the discussion of literature.

GROUP 2

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

Candidates may **not** write a group 2 extended essay in a language which they are offering as a language A1 in their diploma. The group 2 extended essay is intended for candidates who are studying a second modern language.

The extended essay must be written in the language for which it is registered (the target language). It must be focused on matters related to the target culture.

A group 2 extended essay provides candidates with the opportunity to develop their awareness and knowledge of the language studied and their understanding of the culture concerned. This is achieved by enabling candidates to pursue their interest in the language through research based on text (taken to be any meaningful piece of spoken or written language, for example, an article, a book, a play, a poem, a documentary).

Choice of Topic

The essay should consist of the study of an issue related to language, or culture and society, or literature, or a combination of these.

Category 1: Language

The essay should be a specific analysis of the language (its use, structure, etc.) normally related to its cultural context or a specific text.

The following are some examples for guidance only:

French/Dutch: *The Belgian press and bilingualism.*

Finnish/Swedish: *Linguistic interference between contemporary Finnish and Swedish.*

Japanese: *The use of language in Nō theatre.*

Category 2: Culture and Society

The essay should be an analysis of a cultural nature which describes the impact of a particular issue on the form or use of the language.

The following are some examples for guidance only:

- French: *The necessity for the spelling reform in France.*
 Icelandic: *The impact of language planning on modern Icelandic.*
 English: *The reason for the adoption of 'politically correct' terms in the USA.*
 French: *Nuclear energy and national bias in the French press.*

Alternatively an essay in this category could be an analysis of a more general cultural nature but specific to a country or community where the language is spoken. Topics which are too broadly based and which could apply to any culture are inappropriate.

The following are some examples for guidance only:

- French/English: *The language conflict in Quebec and its effects on everyday life in the province.*
 English: *The social consequences of coal mine closures in Great Britain.*

Category 3: Literature

The essay should be an analysis of a literary type, based on a specific work or works of literature exclusively from the target language. In the case of a comparison of texts, **all** texts must originally have been written in the target language.

The following are some examples for guidance only:

- French: *Poverty in 'Une saison dans la vie d'Emmanuel' by Marie-Claire Blais.*
 Arabic: *The imagery of city streets in Naguib Mahfouz's trilogy.*

Refining the Topic

The following examples of titles for group 2 extended essays are intended for guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

Category 1: Examples of Language-based Essays

- Any language: *A comparison of the language used in different newspaper articles on one topic is better than The press.*
 Any language: *A comparison of TV, radio and written language in a football match commentary is better than Football hooliganism.*
 Any language: *The language of advertising is better than Advertising.*

Danish: *The adoption and adaptation by the Danish language of English terminology in tennis and football – a comparative study is better than Sports in Denmark.*

English: *Ernest Hemingway's use of language in 'A Farewell to Arms' is better than 'A Farewell to Arms' by Ernest Hemingway.*

Category 2: Examples of Culture-based and Society-based Essays

Essays of a socio-cultural nature with an impact on the language

Spanish: *The influence of tourism on the Spanish language is better than The tourist industry in Spain.*

German: *Political slogans on the Berlin Wall is better than The history of the Berlin Wall.*

Essays of a general cultural nature

Spanish: *The influence of emigration on Mexican life and culture is better than Emigration in Mexico.*

French: *The effects of the French government's nuclear energy policy on the life of the nation is better than Nuclear energy in France.*

English: *Australia's approach to euthanasia is better than Euthanasia, a moral dilemma.*

Category 3: Examples of Literature-based Essays

English: *The relevance of 'The Crucible' by Arthur Miller to modern times is better than 'The Crucible'.*

Japanese: *The characterization of women in 'Yukiguni' by Yasunari Kawabata is better than The works of Yasunari Kawabata.*

Spanish: *The bullfight in the works of Lorca is better than Lorca's life.*

Primary sources must be used wherever these are appropriate and available. The majority of the source material should be in the target language.

Examples of Inappropriate Topics

Topics related to other IB subjects such as history or economics are inappropriate regardless of the language in which they are written. Listed below are examples of such inappropriate essays.

Renoir's technique.

Drugs in Berlin.

The fishing industry in Norway.

The Ming Dynasty.

Volcanoes in Japan.

Treatment of the Topic

The candidate must use authentic sources, mainly written in the target language. In the case of literature-based essays, **all** texts must have originally been written in the target language.

The essay should consist of both descriptive material which is relevant and an objective, balanced analysis of the issues involved. The essay must be presented as a coherent argument.

In the case of an essay of a general cultural nature, the candidate will need to focus on, and research into, what makes the topic specific and unique to the country or countries concerned. The candidate may draw relevant comparisons with another culture, if appropriate. However, it is essential that the focus remains on the culture of the language concerned. The purpose of comparisons is to shed light on the specific cultural issues raised by the title of the essay.

Candidates may choose to analyse texts in a detailed literary fashion or they may use literary texts as a means of exploring the target language or its culture and society.

Whenever questionnaires have been used or statistics presented, the candidate must show an understanding of the results and be able to interpret them with reference to the issue. A copy of any questionnaires or surveys should be included as an appendix.

If photographs and/or illustrations have been used they should be labelled, explained and justified in the context of the topic.

Assessment Criteria

J Knowledge and understanding of the language/culture/literature studied

Achievement level *Where the topic of the essay is not related to the target language, level 0 must be awarded. Where the topic of the essay is not convincingly related to the target language, level 1 must be awarded.*

- 0** The candidate demonstrates no real knowledge of the language/culture/ literature studied.
- 1** The candidate demonstrates some knowledge but little understanding of the language/culture/literature studied.
- 2** The candidate demonstrates adequate knowledge and some understanding of the language/culture/literature studied.
- 3** The candidate demonstrates good knowledge and understanding of the language/culture/literature studied.
- 4** The candidate demonstrates very good knowledge and understanding of the language/culture/literature studied.

K Point of view on the topic studied

Achievement level *Where the topic of the essay is not related to the target language, level 0 must be awarded. Where the topic of the essay is not convincingly related to the target language, level 1 must be awarded.*

- 0** The candidate does not attempt to develop a coherent point of view.
- 1** The candidate attempts to develop a coherent point of view. It is rarely supported by examples and illustrations, and they are not always relevant.
- 2** The candidate develops a coherent point of view. It is partly supported by relevant examples and illustrations.
- 3** The candidate develops a coherent point of view. It is generally supported by relevant and sufficient examples and illustrations.
- 4** The candidate develops a coherent and convincing point of view. It is fully justified by relevant and well-chosen examples and illustrations.

L **Communication and use of an appropriate register and style**

This includes the selection of appropriate vocabulary, sentence structure and tone.

**Achievement
level**

- 0** The candidate does not communicate effectively **or** the register and style are inappropriate.
- 1** The candidate communicates to a limited extent. The register and style are often inappropriate.
- 2** The candidate generally communicates. The register and style are sometimes inappropriate.
- 3** The candidate communicates effectively. The register and style are generally appropriate.
- 4** The candidate communicates effectively and in a persuasive manner. The register and style are consistently appropriate.

BIOLOGY

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

An extended essay in biology provides a candidate with an opportunity to apply a range of skills while researching a topic of personal interest in the field of biology. The biological nature of an extended essay is characterized by a particular biological emphasis within a more general set of scientific criteria.

Choice of Topic

It is important that the extended essay has a clear biological emphasis and is not more closely related to another subject. An extended essay in an interdisciplinary area such as biochemistry will, if registered as a biology extended essay, be judged on its biological content, not its chemical content. A biology extended essay should therefore incorporate biological theory and emphasize the essential nature of this subject.

Although similar criteria apply to all extended essays in the experimental sciences, for an extended essay submitted in biology, the topic chosen must allow an approach which distinctly relates to biology. Where a topic can be approached from different viewpoints the treatment of the material must be clearly biological.

Essays which deal with human diseases represent a particular case in point, as these can often be dealt with from a number of perspectives (biological, medical, social, economic, etc.). In particular, such essays should avoid an overly medical treatment and should focus on biological aspects of the disease rather than on diagnosis and treatment.

Some topics may be unsuitable for investigation because of ethical issues. Experiments likely to inflict pain on living organisms, have a harmful effect on health, or those which may involve access to, or publication of, confidential medical information should be avoided.

Some topics may be unsuitable for investigation because of safety issues. For example, experiments involving toxic or dangerous chemicals, carcinogenic substances or radioactive materials should be avoided unless adequate safety apparatus and qualified supervision is available.

The following examples of titles for biology extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

*The ozone hole, UV radiation and its possible effect on the growth of *Lepidium sativum* is better than Consequences of the ozone hole.*

The effect of detergent toxicity on certain bacterial strains is better than Detergents in the environment.

A study of malnourished children in Indonesia and the extent of their recovery after a period of supervised improved nutrition is better than Malnutrition in children.

*A study of the effect of differing pH levels on the growth of *Phaseolus vulgaris* is better than The effect of acidity on plant growth.*

*The competitive and evolutionary nature of the symbiotic relationship in *Paramecium busaria* is better than Symbiosis in animals.*

The detection of tuberculosis in Udine hospital and a study of this illness in the population of Udine from 1985 to 1990 is better than Tuberculosis.

The effect of banana peel on seed germination is better than Factors which affect the germination of seeds.

Gel electrophoresis. The construction of an apparatus and the separation of proteins in heat treated cow milk is better than Uses of the gel electrophoresis technique.

Histocompatibility in organ transplants is better than Organ transplants.

Treatment of the Topic

Candidates should point out early in the essay how the research question was arrived at and, if appropriate, how it was narrowed down, by briefly outlining related aspects which are not being considered in the essay. Candidates should be encouraged to formulate one or more hypotheses based on the research question. A single well-formulated question may give rise to several precise hypotheses.

An extended essay in biology may be based on surveys, theoretical models or experimental data. Whichever approach is chosen, the candidate must ensure that sufficient resources, in the form of data and information, can be obtained in order to allow the topic to be effectively researched.

Essays in biology may be based on data collected by the candidate through experimentation, survey, microscopic observations, biological drawing, field work or some other appropriate biological approach. Alternatively, essays may be based on data obtained from literature, ideally from primary sources, and manipulated or analysed in an original way by the candidate. Essays which simply restate facts or data taken directly from the sources are of little value.

Essays which involve practical work carried out in the laboratory, or field work, should include a clear and concise description of the experimental procedure. Candidates should attempt to specify how the research approach and methodology were decided and show any approaches that were considered and rejected. Ideally candidates should carry out the research for the essay solely under the direction of a school supervisor. Some of the best essays have been written by candidates investigating relatively simple phenomena using standard school apparatus and this approach is to be encouraged.

Regardless of where, or under what circumstances, the research is carried out, candidates must provide evidence in the essay of their personal contribution to the research approach and to the selection of the methods used.

Generating and presenting data should not be an end in itself; analysis using appropriate scientific techniques is essential. The main body of the essay should consist of an argument or evaluation based on the data or information presented. Here, the candidate should point out the significance of any graphs, tables or diagrams. Since this is often the longest single section of the essay it is essential that it is well-structured and has an obvious logical progression. A clear structure can be imposed on this section by division into numbered and headed paragraphs. This evaluation should show an understanding of the results and an appreciation of their significance in the light of the literature that has been consulted.

Candidates should provide some explanation of anomalies or unexpected outcomes but this should not form a major part of the discussion. If necessary, modifications to hypotheses presented earlier in the essay should be proposed and a research approach for testing these should be suggested. Some assessment of the outcomes of the research in a future or wider context should be made.

Candidates must be encouraged to undertake a critical evaluation of the work they have done. In this analysis the candidate should describe and explain the limitations imposed on the research by factors such as availability of resources, accuracy and precision of measuring equipment, sample size, validity and reliability of statistics. Biological limitations should be considered, such as those arising from the problem of repeatability and control when using living material, as well as the difficulties of generalizing from research based on a single type of organism or environment.

Assessment Criteria

J Biological study of living organisms

Achievement level

- 0** The essay makes no reference to any relevant aspect of the biological study of living organisms.
- 1** The essay makes limited reference to some relevant aspects of the biological study of living organisms.
- 2** The essay is concerned with some relevant aspects of the biological study of living organisms and shows a limited understanding of the interactions which are apparent within the specific issue being investigated.
- 3** The essay is mainly concerned with specific, relevant aspects of the biological study of living organisms and shows a clear understanding of the interactions which are apparent within the specific issue being investigated.
- 4** The essay is exclusively concerned with specific, relevant and clearly defined aspects of the biological study of living organisms and shows a clear and comprehensive understanding of the interactions which are apparent within the specific issue being investigated.

K Use of methods and sources appropriate to biology

Achievement level

- 0** The methods or sources used are not relevant or not appropriate to biology.
- 1** The methods or sources used are appropriate to biology and relevant to the research question, but show minimal competence or are not carefully chosen.
- 2** The methods or sources used are appropriate to biology and relevant to the research question, and are carefully chosen, but used in a routine manner.
- 3** The methods or sources used are appropriate to biology and relevant to the research question, are carefully chosen and competently used, and there is some evidence of a personal approach to their application.
- 4** The methods or sources used are appropriate to biology and relevant to the research question, are carefully chosen and competently used, and there is clear evidence of a personal approach to their application.

L Analysis of the limitations surrounding the research**Achievement
level**

- | | |
|----------|--|
| 0 | There is no awareness of uncertainties, approximations, quality of research methods or quality of sources used. There are no explanations, confirmations or refutations. |
| 1 | Uncertainties, approximations, quality of research methods or quality of sources used are briefly mentioned. There is no supporting evidence for explanations, confirmations or refutations. |
| 2 | There is a clear awareness but no analysis of uncertainties, approximations, quality of research methods or quality of sources used. Explanations, confirmations and refutations are inadequately supported. |
| 3 | There is a clear awareness but limited analysis of uncertainties, approximations, quality of research methods or quality of sources used. Explanations, confirmations and refutations are not wholly supported. |
| 4 | There is a clear awareness and thorough analysis of uncertainties, approximations, quality of research methods or quality of sources used. Explanations, confirmations and refutations are supported by this analysis. |

BUSINESS AND ORGANIZATION

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

An extended essay in business and organization is intended to provide candidates with an opportunity to undertake an in-depth study of an organizational activity or activities. It allows the candidate to undertake personal research and to relate theory learned to the problems associated with an actual organization.

Choice of Topic

Candidates may use any form/s of organization as the basis of their extended essay. Some examples are:

- school
- charity
- government body
- hospital
- business.

In their choice of a topic, candidates are advised to concentrate on a limited number of organizational activities within one organization. It is important that the research question is sufficiently focused to allow adequate treatment within the word limit.

Candidates are encouraged to choose a topic that will require personal research related to an actual organization.

The topic may be chosen because of an interest in issues raised in the classroom, aspects of a candidate's own experience, or current events. The treatment of the topic must, however, meet the subject criteria for business and organization. An essay in which there is no personal research, which is dependent on summarizing secondary sources, and/or which is essentially narrative or descriptive in nature should be avoided.

The title of the extended essay should indicate a specific focus with reference to an organizational activity (or activities) and, if appropriate, an actual organization (or organizations).

The following examples of titles for business and organization extended essays are intended for guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

Communicating corporate objectives to the staff at XYZ is better than The importance of communication.

Comparing approaches to social responsibility in ABC and XYZ is better than Different approaches to social responsibility.

XYZ: the benefits of effective leadership is better than Effective leadership.

New product development at XYZ is better than Development at XYZ.

XYZ: the relationship between motivation and quality is better than Motivation at XYZ.

Treatment of the Topic

Candidates may need support and advice from their supervisor when undertaking practical activities in search of material for their extended essay. In particular, there is a need in all organizations for tact, sensitivity to other people, respect of confidentiality, and frequently a declaration to maintain secrecy. Health and safety, and even insurance, need to be thought about before starting the research.

It is important that the approach to all aspects of the essay is directly related to the research question. Candidates must be careful to ensure that research carried out addresses the question, for example, in questionnaires and in information requested, or elicited in an interview. The development of the essay must be related to the question directly and must not include information that is unnecessary and not related to the question.

The extended essay must use selected analytical tools and/or statistical techniques to support the discussion. Some examples are:

- conventional accounting forms
- break-even charts
- financial performance ratios
- statistical presentations
- structured and titled tables, charts and/or diagrams.

The style and format of the extended essay should be in the form of a useful working document which might be valuable to the decision-makers within an organization.

If candidates are not able to choose a topic that requires personal research related to an actual organization, it is essential that the extended essay draws on examples from secondary sources (i.e. documented case studies). In such a case, it is important that the candidate goes beyond a simple summary of secondary source material.

In most extended essays it will be appropriate to examine the role of both selected individuals and groups. However, it is expected that in some extended essays the examination of both may not be appropriate.

Candidates must ask probing questions and look at all relevant factors when considering the data obtained. Information cannot always be accepted at face value, and candidates must look for trends and patterns that may emerge. Candidates should indicate unresolved questions or new questions that might arise from their study.

Assessment Criteria

J Theoretical aspects of organizational activity in relation to an actual case study, or studies

Achievement level

- | | |
|----------|---|
| 0 | Theoretical and/or practical principles of organization are stated, but not related to a case study, or studies. |
| 1 | Theoretical and/or practical principles of organization are related to a case study, or studies, some of which are appropriate. |
| 2 | Theoretical and practical principles of organization are related to a case study, or studies, most of which are appropriate. |
| 3 | Theoretical and practical principles of organization are related to a case study, or studies, all of which are appropriate. |

K Formulation of the problem/s to be studied in a decision-making framework

Achievement level

- | | |
|----------|---|
| 0 | The problem/s is/are stated with little or no understanding of the decision-making environment. |
| 1 | The problem/s is/are stated and a basic understanding of the decision-making environment is evident. |
| 2 | The relationship of the problem/s to the organization's need for decision-making is stated. |
| 3 | The direct relevance of the problem/s to the organization's need for decision-making is clearly stated. |

L **Effects of change on organizational activities**

Achievement level

- 0** There is little or no reference to the effects of change on organizational activities.
- 1** Within the essay there is reference to the dynamic nature of organizational activity and its susceptibility to change. The effects of change are related to the problem/s being studied.
- 2** Within the essay there is a clear understanding that organizations are dynamic in nature and susceptible to change. The effects of change are generally evaluated with reference to the problem/s being studied.
- 3** Throughout the essay there is a clear understanding that organizations are dynamic in nature and susceptible to change. The effects of change are fully evaluated with reference to the problem/s being studied.

M **Selection and application of appropriate analytical tools and/or statistical techniques**

Achievement level

- 0** Discussion is not supported by the selection, application or consideration of appropriate analytical tools and/or statistical techniques.
- 1** Discussion is supported by the consideration of appropriate analytical tools and/or statistical techniques.
- 2** Discussion is supported by the selection and application of appropriate analytical tools and/or statistical techniques.
- 3** Discussion is supported by the selection and correct application of appropriate analytical tools and/or statistical techniques.

CHEMISTRY

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

An extended essay in chemistry provides a candidate with an opportunity to investigate personally a particular aspect of the materials of our environment. Such extended essays must be characterized by a particular chemical emphasis within a more general set of scientific criteria.

Choice of Topic

It is important that the extended essay has a clear chemical emphasis and is not more closely related to another subject. Chemistry is the science that deals with the composition, characterization, and transformation of substances. A chemistry extended essay should therefore incorporate chemical principles and theory, and emphasize the essential nature of chemistry, relating to the study of matter and of the changes it undergoes.

Although similar criteria apply to all extended essays in the experimental sciences, for an extended essay submitted in chemistry the topic chosen must allow an approach which distinctly involves chemistry. Where a topic might be approached from different viewpoints, the treatment of the material must be approached from a chemical perspective. An extended essay in an interdisciplinary area such as biochemistry will, if registered as a chemistry extended essay, be judged on its chemical content, not its biological content.

The scope of the topic and the research associated with it should enable all the criteria, particularly the subject specific criteria, to be addressed. A good topic is one where the single research question is sharply focused and is susceptible to effective treatment within the word limit. Perhaps the most important factor is the depth of treatment that can be given to the topic by the candidate.

Some topics may be unsuitable for investigation because of safety issues. For example, experiments involving toxic or dangerous chemicals, carcinogenic substances or radioactive materials should be avoided unless adequate safety apparatus and qualified supervision is available.

Other topics may be unsuitable because the outcome is already well known and documented in standard text books **and** the candidate may not be able to show any personal input. An example might be a study of the reactions of the alkali metals with water as this is already covered by the syllabus. However some care does need to be exercised in deciding whether a topic is suitable or not; for example, a few years ago the study of the allotropes of carbon may have been thought to be trivial but this would not be the case today.

The following examples of titles for chemistry extended essays are intended for guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

Spectrophotometric determination of trace amounts of lead in drinking water **is better than** *Water analysis*.

The kinetics of oxidation of iodine ions with hydrogen peroxide in acidic solutions **is better than** *Chemical kinetics*.

The analysis of the red dyes present in different brands of tomato ketchup by thin layer chromatography **is better than** *The use of chromatography to separate materials*.

Is it better to use dried animal manure as a fertilizer or as a fuel? **is better than** *Combustion and nitrogen analysis*.

The effects of sugar-free chewing gum on the pH in the mouth after a meal **is better than** *Acid-base chemistry*.

Treatment of the Topic

An extended essay in chemistry may be based on literature, theoretical models or experimental data. Whichever category is chosen the candidate should ensure that sufficient data will be available for evaluation and that the topic can be researched accurately using locally available resources.

Candidates who choose to write an extended essay based on literature and/or surveys should ensure that their extended essay clearly shows its chemical basis. Essays written at the level of a newspaper or news magazine article are unlikely to achieve a high mark.

Since chemistry is an experimental science, candidates are strongly encouraged to undertake experimental work as part of their research, although this is not compulsory. Any experimental work which does form part of a chemistry extended essay should be described in sufficient detail to allow the work to be repeated by others, and candidates are strongly encouraged to research the literature first. Where possible, they should consult original research using scientific journals, personal communications and, where appropriate, the Internet. Textbooks should never be the only source of information.

Data collected from an experiment designed by the candidate is of little value unless it is analysed, using appropriate scientific techniques, evaluated and perhaps compared with appropriate models.

It is possible to produce an extended essay in chemistry in which the candidate has used data collected elsewhere as the primary source. In such cases, the element of personal analysis and evaluation is important.

In any chemistry extended essay candidates should be able to demonstrate that they understand the theory underlying any experimental work and state any assumptions made. They should show an understanding of the results obtained and be able to interpret them with reference to the research question posed. They should be critical of inadequate experimental design, the limitations of the experimental method and any systematic errors. Candidates should be encouraged to consider unresolved questions in their research, and to suggest new questions and areas for further investigation in their conclusion.

Assessment Criteria

J Principles and ideas used to describe and explain the properties and behaviour of materials

Achievement level

- 0** There is no evidence of any principles or ideas relating to chemistry.
- 1** Some of the relevant principles or ideas relating to chemistry are mentioned but little use is made of them.
- 2** Some of the relevant principles or ideas relating to chemistry are evident and used in a routine manner.
- 3** Many of the relevant principles and ideas relating to chemistry are evident and good use is made of them.
- 4** The relevant principles and ideas relating to chemistry are included and there is good evidence that they are fully understood and applied correctly.

K Use of methods and sources appropriate to chemistry

Achievement level

- 0** The methods or sources used are not relevant or not appropriate to chemistry.
- 1** The methods or sources used are appropriate to chemistry and relevant to the research question, but show minimal competence or are not carefully chosen.
- 2** The methods or sources used are appropriate to chemistry and relevant to the research question, and are carefully chosen, but used in a routine manner.
- 3** The methods or sources used are appropriate to chemistry and relevant to the research question, are carefully chosen, and used competently, and there is some evidence of a personal approach to their application.
- 4** The methods or sources used are appropriate to chemistry and relevant to the research question, are carefully chosen and used competently, and there is clear evidence of a personal approach to their application.

L Reasoning surrounding the research and its limitations

Achievement level

- 0** There is no awareness of the quality of the experimental design or the quality of sources accessed. There are no explanations, confirmations or refutations.
- 1** The quality of the experimental design or the quality of sources is briefly mentioned. There is no supporting evidence for explanations, confirmations or refutations.
- 2** The quality of the experimental design or the quality of sources is considered, but not analysed. There is little supporting evidence for explanations, confirmations or refutations.
- 3** The quality of the experimental design or the quality of sources is considered and subjected to limited analysis. There is some supporting evidence for explanations, confirmations or refutations.
- 4** Uncertainties in experimental data are thoroughly analysed and approximations in models are accounted for. Inadequate experimental design or any systematic error is exposed. The quality of sources accessed is verified by secondary sources or by direct calculations. Explanations, confirmations and refutations are supported by this analysis.

CLASSICAL GREEK and LATIN

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

An extended essay in classical Greek or Latin provides the candidate with an opportunity to investigate in depth areas of particular personal interest in the context of the ancient Greek or Roman worlds.

Choice of Topic

The chosen topic will normally focus on an aspect of the language and/or literature and/or culture of the ancient Greek or Roman world.

Candidates may choose to focus either on linguistic features of classical Greek or Latin, or to investigate some aspect of classical Greek or Latin literature, or of classical Greek or Roman culture. Usually, however, since the language, literature and civilization are closely interwoven, it is appropriate to study the language in the context of the literature and civilization, and literature and civilization as presented through the classical Greek or Latin languages.

A topic should be reconsidered if it is interdisciplinary in nature, and/or not directly related to classical languages, literature or civilization.

The following examples of titles for classical languages extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

A commentary on the language and style of Virgil, 'Aeneid' 5: 124 to 285 is better than The style of Virgil's 'Aeneid'.

What is the function of the description of Aeneas' shield ('Aeneid' 8: 608-731) within the 'Aeneid' as a whole? is better than The structure of the 'Aeneid'.

The role of the Ara Pacis in promoting Augustan ideology is better than Propaganda of the Emperor Augustus.

The function of wit and humour in Cicero's 'Pro Caelio' is better than Cicero as an orator.

Treatment of the Topic

The topic will normally be investigated by particular reference to appropriate texts or other source material such as works of art or architecture.

If the focus of the extended essay is linguistic, it is essential for the candidate to demonstrate an understanding of the grammatical structure of the language and show how, for example, authors exploit its features.

If the focus of the extended essay is on literature, the candidate should show an awareness of a work read, at least partly, in the original Greek or Latin. The extended essay should reveal an understanding of the ways in which the author exploits the language to create particular effects.

If the focus of the extended essay is on the ancient civilization concerned, it should show clear evidence of substantial background reading and an awareness of the major historical and cultural features at work in this setting. Links between the language, literature and culture should be identified and scrutinized.

The historical context of the extended essay should be established by means of appropriate references to literature, art and archaeological sources.

The expectations of a classical languages extended essay in relation to the general assessment criteria can be illustrated by means of one of the examples above: *What is the function of the description of Aeneas' shield ('Aeneid' 8: 608-731) within the 'Aeneid' as a whole?*

An extended essay that went through the scenes one by one and explained the allusions, but no more, might score 1 on criterion C, analysis/interpretation (there is after all 'some' attempt, but it is not ambitious), but probably 0 on criterion D, argument/evaluation, given that nothing is done to make it relevant to the function nor to relate the section to the 'Aeneid' as a whole.

An essay that made some attempt to set the scene within the context of book 8, explaining why a shield was necessary; that discussed the relevance of the Actium scene to the war which Aeneas is about to fight (e.g. removing a threat to Rome and asserting Roman values, but not going much beyond that); and that made some attempt to set the scene against the Augustan background, and the relevance of the 'Aeneid' to Augustus himself: this might score 2 or 3 both on analysis/interpretation and on argument/evaluation, depending on how completely it was carried through.

An essay that did that and also discussed the relevance of Actium to the other scenes on the shield, and sought to find links between them (the prominence of civil conflict, for instance, or the emphasis on sumptuousness and luxury in both the defeat of the Gauls and the Actium scene); that related those links to wider themes in the 'Aeneid', such as the stress on 'oriental' luxury in Troy and Carthage but Italian hardiness, and the presentation of the war in Italy as a sort of civil conflict between two peoples which ought to be, and are destined to be, one; that made some attempt to relate the selection of material in the shield to that in the pageant of heroes in book 6, and/or to Jupiter's speech to Venus in book 1; this would be likely to score 4 on both counts, if it was carried through well.

The holistic judgement would be guided by similar considerations along with the other general and subject assessment criteria. It would naturally also take into account cogency of argument and illustration, and appropriateness of style.

Assessment Criteria

J Knowledge and personal appreciation of the texts/sources studied

Achievement level

- 0** The candidate demonstrates no satisfactory knowledge or understanding of the texts/sources studied and/or the research question is not directly related to ancient Greece or Rome.
- 1** The candidate demonstrates some knowledge of the texts/sources studied but does not attempt to express his/her personal views **or** the candidate expresses personal views only.
- 2** The candidate demonstrates a satisfactory knowledge of the texts/sources studied and includes some personal views.
- 3** The candidate demonstrates a satisfactory knowledge of the texts/sources studied and shows some ability to make independent comment on the basis of personal responses and views.
- 4** The candidate demonstrates a comprehensive knowledge of the texts/sources studied and makes assured judgements on the basis of justified personal responses and views.

K Balance between exposition and analysis

Achievement level

- 0** The essay is seriously deficient in both descriptive material and critical analysis and/or the research question is not directly related to ancient Greece or Rome.
- 1** The candidate offers sufficient descriptive material but does not attempt a critical analysis.
- 2** The candidate offers sufficient descriptive material and occasionally attempts a critical analysis.
- 3** The candidate achieves a balance between descriptive material and critical analysis.
- 4** The candidate successfully integrates descriptive material and critical analysis.

L Historical and/or cultural context of the argument/evaluation**Achievement level**

- 0** The argument/evaluation is not placed in its context and/or the research question is not directly related to ancient Greece or Rome.
- 1** The argument/evaluation is very loosely placed in context with little attempt at analysis. Very few of the relevant links have been noted.
- 2** The argument/evaluation is loosely placed in context, which has been analysed superficially. Few of the relevant links have been observed.
- 3** The argument/evaluation is generally placed in context, which has been analysed with some care. Some of the relevant links have been adequately explored.
- 4** The argument/evaluation is directly and clearly placed in context, which has been carefully, critically and systematically analysed. Most relevant links have been thoroughly explored.

COMPUTER SCIENCE

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

An extended essay in computer science provides a candidate with an opportunity to investigate a particular aspect of computing and its interaction with society.

Choice of Topic

It is important that the choice of topic and its treatment reflect a firm emphasis on computers and/or their application in an area of human activity. Candidates must show that they have gained an understanding of the topic, and the relevant theory and practices of computer science.

It is also important that the work produced goes beyond a summary of journalistic views on a particular topic. In such a rapidly developing subject area, care should be taken to ensure that any source material is up to date, relevant and identifiable. Candidates should not choose to investigate a complex computing topic for which they have little or no access to appropriate background material and/or resources.

Care should be taken to ensure that the topic chosen is within the field of computer science and is not primarily a topic in another subject discipline, especially information technology in a global society (ITGS). The use of a computer does not automatically imply that the topic is in the field of computer science and that it should be registered in computer science. The research question needs to be clear, precise and sharply focused.

The candidate's approach to the research question should include aspects of the theory of computer science, in addition to other relevant information gathered from up-to-date sources such as the Internet, or by use of interviews, questionnaires or surveys. Care has to be taken, when undertaking research using the Internet, that precise searches are used. Data collection methods such as interviews and questionnaires need to be summarized and a list of questions and responses given in the appendix.

If the computer is used in a peripheral manner, such as in a survey, in an analysis or in the development of an application, consideration should be given to registering the extended essay in the relevant subject and not in computer science.

The following examples of titles for computer science extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

Data compression techniques with LEMPEL-ZIV and STATIC HUFFMAN is better than Data storage techniques.

The interpretation, parsing and storing of PROLOG terms in TURBO PASCAL is better than Comparison of programming languages.

Design and implementation of a database system for the school library is better than Computer databases.

Artificial intelligence: analysis of the memory of a neural network is better than Network data models.

Artificial intelligence: a description of the back propagation algorithm and its application is better than artificial intelligence.

A computer simulation of a simple stock market is better than Computer simulation.

IRC/URL development is better than The Internet.

Fuzzy versus symbolic logic in control systems is better than Control systems.

Treatment of the Topic

An extended essay in computer science is not intended as a vehicle to demonstrate programming skills, but is intended to support the acquisition of research skills as a result of independent personal research.

While an extended essay may refer to a programming exercise, such as a compiler for a new language designed by the candidate, the emphasis in such a case should be on the design and development of the compiler and on language design. Although program fragments may be included in the body of the extended essay to support the design and the discussion, the full program code (including internal documentation) should appear in the appendix as evidence. Each line of code that appears in the body of the essay should count as two words when calculating the length of the essay, while any internal documentation of a program fragment should be ignored.

If programming code is part of the main body of the extended essay, the techniques demonstrated by the code should be those of computer science. If a computer program has been written as a result of the extended essay investigation, the program should be included as an appendix and should not be considered in the word count.

Futuristic topics in computer science should be based on sound theory and projections of well-known computer and information science authorities. Candidates are expected to support personal conclusions by the theories presented.

Assessment Criteria

J Use of the theory and practices of computer science to answer the research question

Achievement level

- 0 The candidate has not reached a standard described by any of the descriptors below.
- 1 The candidate states the relevant theory and practices.
- 2 The candidate outlines the relevant theory and practices.
- 3 The candidate describes the relevant theory and practices.
- 4 The candidate explains the relevant theory and practices.

K Analysis of the role of a computer system in relation to the research question

Achievement level

- 0 The candidate has not reached a standard described by any of the descriptors below.
- 1 The candidate outlines the role of the computer system and this is related to the research question.
- 2 The candidate describes the role of the computer system and this is related to the research question.
- 3 The candidate analyses partially the role of the computer system and this is related to the research question.
- 4 The candidate analyses fully the role of the computer system and this is related to the research question.
- 5 The candidate analyses and evaluates fully the role of the computer system and this is related to the research question.

L Application or use of the research question**Achievement
level**

- 0** The candidate has not reached a standard described by any of the descriptors below.
- 1** The candidate states the application or use of the research question.
- 2** The candidate describes the application or use of the research question.
- 3** The candidate analyses and evaluates the application or use of the research question.

DESIGN TECHNOLOGY

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

Design technology concerns the balance between familiarity with the behaviour of materials and systems, the application of knowledge and skills, and the creativity and resourcefulness of people. An extended essay in design technology, therefore, provides candidates with the opportunity to explore the processes involved in the design and development of products or systems, and to make an assessment of their impact on individuals and society at large. When undertaking research for an extended essay in design technology, candidates should consider the means by which people extend their control of the environment and events through the design and production of products or the design and operation of systems, and the extent to which this control is justified.

Choice of Topic

An extended essay registered in design technology must be clearly concerned with issues relating directly to the subject. Where a topic might be approached from different viewpoints, the treatment of the material must be approached from a design technology perspective.

Candidates should consider the implications of the assessment criteria carefully when formulating their research objectives.

Candidates are advised to select a topic which is appropriate to their interests, abilities and the resources available. They should avoid topics of a purely historical nature. For example, an essay focusing on the development of a product should investigate the design stages and influential factors rather than the historical sequence of events over a substantial period of time. The history of the vacuum cleaner would, therefore, not be a suitable topic but an investigation into the importance of new materials and technology in the design of a contemporary vacuum cleaner would be appropriate.

Essays may be focused on systems design rather than a specific product, for example:

- investigating the labelling of chemicals in transit, from the point of view of provision for dealing with accidents
- investigating the possibilities for reducing food wastage in a school/college refectory
- evaluating the feasibility of a combined heat and power scheme for a local community.

When choosing a topic for a design technology extended essay, candidates should start by exploring appropriate design contexts. For example, it may be worth considering:

- artefacts which do not work properly or seem wasteful of resources
- the needs of particular user groups such as the elderly, infirm or disabled
- new technologies and how they might influence or combine with existing technologies.

Candidates must show a clear understanding of the chosen context and explain fully the value of the study. There must be a substantial amount of technological content in the essay.

The following examples of titles for design technology extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than the broad topics (indicated by the second title).

A comparative study of the use of cotton and acrylic fibres for sports shirts based on the properties of the materials and performance characteristics **is better than** *A comparison of natural and synthetic fibres.*

A study of how the combination of new materials and manufacturing technology has affected the design of vacuum cleaners **is better than** *A study of vacuum cleaners.*

An investigation into why canned foods are not packaged in plastics **is better than** *A study of packaging design.*

A study of how ergonomics can be used to improve the design of the telephone for physically impaired people **is better than** *A study of design for the physically impaired.*

An investigation into whether an automated textile production process provides better quality products than a mechanized process **is better than** *A comparison between mechanization and automation.*

A study investigating the impact of computer-aided design on modelling techniques **is better than** *A study of computer-aided design.*

A study investigating the success of the design of computer chairs for reducing back strain in users **is better than** *A study of ergonomics.*

A study comparing the performance characteristics of different personal stereos **is better than** *A study of the design of personal stereos.*

A study investigating how useful a guide the 'use by' or 'best before' date information is to the consumer for assessing good quality **is better than** *A study of food labelling.*

A study comparing the performance, comfort and cost of a leather football boot compared to one made of moulded rubber **is better than** *A study of the design of football boots.*

A study assessing the feasibility of using replacement hardwood made from expanded polystyrene for furniture making **is better than** *A study of the global effects of deforestation.*

Treatment of the Topic

An extended essay in design technology may be based on literature, surveys or experiments. However, since design technology is an experimental science, many candidates will wish to base their essay on experimental work as part of the research, although this is not compulsory.

Data should be collected from different sources using a variety of appropriate methods and then analysed using appropriate scientific and technological techniques, otherwise it will be of little value. Data should only be included in the essay when directly relevant to the chosen topic.

The topic should be treated at an appropriate level of study: not so specific or personalized that it has no wider social, political or organizational aspects, nor so broad that there is little potential for taking or stimulating action in the problem area.

Candidates should identify the key issues that emerge from the investigation and assess their significance in relation to the original proposition. Above all, the essay must be based on a proposition that can be explored and from which conclusions can be drawn and recommendations made.

Assessment Criteria

J Understanding the design process and application of scientific and technological knowledge within a particular design context

Achievement level

- 0** The candidate has not reached a standard described by any of the descriptors given below.
- 1** There is evidence of some understanding of the design process and the importance of scientific and technological knowledge related to a design context.
- 2** There is evidence of a good understanding of the design process and the importance of scientific and technological knowledge as the basis of the chosen design concept.
- 3** There is evidence of a thorough understanding of the design process and how elements of the process vary in importance depending on the context. The relevance of scientific and technological knowledge to the design concept is fully explained.

K Impact of the chosen design concept on the individual user or consumer

Achievement level

- 0** The candidate has not reached a standard described by any of the descriptors given below.
- 1** The essay expresses some consideration of the influence of economic, aesthetic and ergonomic factors in assessing the impact of the design concept on the individual user/consumer.
- 2** The essay expresses a reasonable judgement of the influence of economic, aesthetic and ergonomic factors in assessing the impact of the design concept on the individual user/consumer.
- 3** The essay includes a comprehensive assessment of the impact of the chosen design concept on the individual user/consumer in relation to economic, aesthetic and ergonomic factors.

L Impact of the chosen design concept on society and the environment

Achievement level

- 0** The candidate has not reached a standard described by any of the descriptors given below.
- 1** The essay expresses some attempt to consider the impact of the chosen design concept on society and the environment.
- 2** The essay expresses a reasonable judgement of the impact of the chosen design concept on society and the environment.
- 3** The essay includes a comprehensive assessment of the impact of the chosen design concept on society and the environment.

M Values in design technology

Achievement level

- 0** The candidate has not reached a standard described by any of the descriptors given below.
- 1** The essay makes some attempt to consider the issue of values in design technology.
- 2** The essay attempts a reasonable consideration of the issue of values in design technology.
- 3** The essay deals with the complex issues surrounding values in design technology in a comprehensive and astute manner.

ECONOMICS

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

The extended essay in economics offers the opportunity to undertake research in economics and to exercise disciplined skills of economic reasoning and analysis in an area of particular interest to the candidate.

Choice of Topic

The chosen topic may be inspired, for example, by issues raised in the classroom, by current events, by circumstances relating to the immediate environment, or by aspects of the candidate's own socio-economic situation. In every case candidates should start from the unknown and discover something new for themselves.

A temptation, which should be resisted, is to start from the known, to rely on a well-documented topic in economics or on information from a relation or family friend in business. An essay in which there is no personal research, which is dependent entirely on summarizing secondary sources and/or which is essentially narrative or descriptive in nature should be avoided. If a research question does not allow theoretical analysis, and particularly the application and testing of accepted theory, it cannot be considered suitable. For example, an essay based on Bahrain International Airport which only describes the facilities and numbers of airline users cannot contain a serious research question.

The following examples of titles for economics extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

Unemployment in the city I live in **is better than** *Unemployment in Europe in the 1990s.*

Do interest rates affect investment decisions? **is better than** *The Third World debt crisis.*

Competition among petrol stations in my area **is better than** *OPEC 1990-2000.*

A case study of a Mexico City taxi rank: do drivers price discriminate? **is better than** *The effect of economic reforms in Mexico.*

The causes of changed employment patterns in local agriculture and industry **is better than** *Common agricultural policy in Europe.*

In defining the scope of the economics topic to be treated, candidates might consider undertaking a small scale investigation to test an aspect of received theory. Alternatively, a larger topic might be selected, which would lead to the examination in depth of a small case study.

The choice of a microeconomic topic may provide a better opportunity for both originality and clear focus. However, essays in the macroeconomic domain can more than satisfy the criteria if a personal approach is introduced by analysing the nature of the macroeconomic theme in specific instances and by particular reference. For example:

Measuring the price elasticity of demand for products in the school shop is better than Price elasticity: Brazil's exports since 1960.

The effects of price controls: a case study of basic foodstuffs in a suburb of my home town is better than The effects of price controls in Zambia.

What are the effects of floating exchange rates on the shoe industry in Brazil? is better than What are the effects of floating exchange rates on the Brazilian economy?

The multiplier effects of locating the XYZ company's new factory in my city is better than The economic effects of multinationals.

The external costs of the Australian coal industry is better than Externalities.

Treatment of the Topic

It is important that the topic and research question both reflect a firm emphasis on economics and that they do not become directed towards another subject area. Where topics could be approached from different viewpoints, such as those of the geographer, anthropologist, environmentalist or historian, the treatment of material must meet the subject criteria for economics.

Special care should be taken to distinguish between economics on the one hand and business and organization on the other. It should be possible to demonstrate that an economics topic is linked in some way to basic problems of policy or questions like 'what?', 'how?' or 'for whom?' Experience suggests that extended essays based on an 'enterprise' activity, or involving group work, need to be treated with caution if they are to be registered as an economics extended essay.

In relation to the collection and presentation of data, the use of clear, relevant diagrams, statistics, tables, histograms and graphs is of particular importance. They should appear in the body of the essay as close as possible to their first reference. Any such material that is not original must be acknowledged.

Data included is of little value unless analysed through the exercise of clear, logical economic reasoning using, where appropriate, statistical and graphical techniques. The results should then be evaluated, trends determined, preliminary conclusions drawn and further questions proposed.

Where candidates draw conclusions based on time-series data they should be prepared to convert current prices into constant prices.

An extended essay in economics is a formal

Assessment Criteria

J Appropriate economic information

Achievement level

- | | |
|---|--|
| 0 | The essay contains little or no evidence of appropriate economic information, or much of the information gathered has no direct relevance to the research question. |
| 1 | Sufficient information has been collected but some of the techniques for generating data may be poor. Some of the information may be superficial or not clearly linked to the research question. |
| 2 | The essay uses appropriate and considered sources of information that are generally relevant and clearly linked to the research question. However, there may be a heavy dependence on secondary sources. |
| 3 | The essay contains a comprehensive and original selection of economic information. It is likely that relevant and imaginative primary sources have been used. |

K Using the language of economics

Achievement level

- | | |
|---|---|
| 0 | The essay demonstrates very little or no economic terminology. |
| 1 | Some economic terms are used but they are not defined or are poorly defined. |
| 2 | Economic terms are generally used appropriately and correctly, and are accurately defined in most cases. |
| 3 | Economic terms are used accurately and reliably whenever they are needed. Exact definitions are given wherever appropriate. |

L Understanding the relevant economic concepts**Achievement level**

- 0** Few or no relevant economic concepts are used, or if some concepts are used the candidate shows no understanding of them.
- 1** Some important concepts may have been ignored or the candidate shows only a partial understanding of the concepts needed to address the research question.
- 2** The candidate has applied, with sufficient understanding, the main concepts needed to address the research question.
- 3** The essay applies a well-considered choice of concepts when addressing the research question. The concepts are applied in an accurate, consistent and even imaginative manner.

M Use of relevant economic theory**Achievement level**

- 0** There is little or no economic theory.
- 1** Some relevant theory has been identified but it may not be clearly explained or logically applied.
- 2** Relevant theory has been identified, clearly explained and logically applied. Any errors in application do not detract significantly from the overall result.
- 3** Relevant and sufficient theory has been explained. It has been logically and even imaginatively applied when answering the research question. The candidate shows a thorough understanding of the economic theory used.

ENVIRONMENTAL SYSTEMS

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

An extended essay in environmental systems provides a candidate with the opportunity to explore questions in terrestrial, freshwater or marine environments. The characteristic nature of an essay in this subject will lie in the application of a systems approach to an environmental issue.

Choice of Topic

Since the IB course in environmental systems requires expertise in both earth and life sciences, it is to some degree interdisciplinary. Great care should be taken to ensure that the topic undertaken for an extended essay would not be more appropriate to biology or geography, but represents a truly integrated systems approach to the environment.

Although similar assessment criteria apply to all extended essays in the experimental sciences, for an extended essay submitted in environmental systems the topic chosen must allow for a systems approach. That is to say, the topic should allow for the collection of objective, usually quantitative, data that can be used for the construction of appropriate models, such as graphical representations and flow diagrams.

Some topics may be unsuitable for investigation because of ethical issues. Experiments likely to inflict pain on living organisms, or cause environmental damage, must be avoided.

Some topics may be unsuitable for investigation because of safety issues. For example, experiments involving toxic or dangerous chemicals, carcinogenic substances or radioactive materials should be avoided unless adequate safety apparatus and qualified supervision is available.

The following examples of titles for environmental systems extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

Lead pollution: impacts and control in Toronto is better than Atmospheric pollution.

Impacts of Chernobyl on a Welsh dairy farm is better than Nuclear energy: the green solution?

An investigation into the energy conversion efficiency of commercial feeds for Tilapia populations is better than Aquatic food production and global hunger.

Sustainable forestry management in Finland is better than Deforestation and global warming.

The effects of a drainage outlet on the physical factors which may influence the zoning of algae on a rocky shore is better than The effect of sewage outlets in the environment.

Treatment of the Topic

An extended essay in environmental systems may be based on surveys, theoretical models or experimental data. Whichever category is chosen the candidate should ensure that sufficient data will be available for evaluation and that the topic can be researched accurately using locally available resources.

Whilst field, laboratory or computer-based experimental work should be encouraged, it is quite possible that some environmental systems are better studied from literature.

The candidate should identify the system under observation and construct a descriptive and/or quantitative model of it. The term 'model' in this context is meant in its broadest sense to include, for example, mathematical formulae, maps, graphical representations and flow diagrams.

Any experimental work which forms part of an environmental systems extended essay should be adequately described to allow for verification of the model by others.

Environmental systems data is of little value unless it is analysed, using appropriate scientific techniques, and then evaluated. The element of personal evaluation is important when interpreting the results of data analysis. The candidate should show an understanding of the results and be able to interpret them with reference to the research question. Some explanation may be necessary to account for anomalies, but this should form a subsidiary part of the discussion.

Where a hypothesis has been tested, it may be necessary to consider modifying it. Alternatively, it may be helpful if some assessment of the conclusion/s could be made in a future, or wider, context.

Aside from incorporating environmental theory, it is expected that techniques/procedures which are characteristic of environmental enquiry will be included as appropriate to the topic being investigated, for example, biotic indices, measurement of primary and secondary productivity, and biomass estimations.

The approach to the research question needs to involve the collection of objective, usually quantitative, data that can be used for the construction of appropriate models. Surveys may be used (e.g. in an attempt to assess and quantify the use or output of an environmentally damaging product) but not to gain subjective opinions on which to evaluate hypotheses. The approach must also be one of argument rather than statement. If a candidate merely collects information describing, for example, the pollution of a certain habitat, but has no numerical data to analyse, or no baseline study with which to make comparison, or no alternative information from a source with conflicting interests, then there is very little opportunity for the candidate to demonstrate any skills of analysis or evaluation.

The analysis and interpretation should involve the candidate identifying clearly the various components of the data collected and their interrelationships. This will generally include some graphical representations and/or mathematical manipulations and/or flow diagrams. While criterion D employs the phrase “where an evaluation is appropriate”, in an environmental systems essay some element of evaluation will always be considered appropriate – an evaluation of the reliability of the data and methods of collection, if nothing else.

The standard of the bibliography will always be important in environmental systems essays, but the expectation is that it will be far more extensive in literature-based essays than in those which involve largely practical, experimental investigation.

The holistic judgement of the essay, and indirectly many of the other criteria of assessment, invariably favour those candidates who have some direct involvement or personal contacts in the environmental issue with which they are dealing and this should be encouraged wherever possible.

Assessment Criteria

J Understanding of the environment in terms of emphasis and approach

Achievement level

- | | |
|----------|---|
| 0 | The essay does not address an environmental issue. |
| 1 | The essay is superficially environmental but addresses issues from a single perspective (e.g. biological, geographical, technological), showing no recognition of the systematic nature of the environment. |
| 2 | Environmental issues are central to the essay. There is some implicit recognition of the systematic nature of the environment although this is without reference to the formal concepts or terminology of a systems approach. |
| 3 | Environmental issues are central to the essay. There is some explicit recognition of the systematic nature of the environment and the formal concepts and terminology of the systems approach are occasionally employed. |
| 4 | The systematic nature of the environment is a significant theme developed throughout the essay. The formal concepts and terminology of the systems approach are referred to accurately and with understanding wherever appropriate. |

K Valid scientific techniques appropriate to environmental systems in practical investigations and/or in the literature sources accessed

Candidates should be able to recognize valid scientific methodology and show some creativity in handling it. This criterion will be applied to the candidate's personal methodology in practical investigations and/or the selection and use of other sources in literature-based research.

Achievement level

- | | |
|----------|---|
| 0 | No relevant and valid scientific techniques are apparent. |
| 1 | Scientific techniques are valid and relevant to the research question but show minimal competence in practice or are very limited in the literature sources accessed. |
| 2 | Scientific techniques, valid and relevant to the research question, are applied in a competent but routine manner in practical investigations or are only apparent in a narrow range of literature resources. |
| 3 | Scientific techniques, valid and relevant to the research question, are competently applied with some evidence of an original/personal approach or are apparent in a sufficient range of literature resources and analysed with some evidence of an original/personal approach to the data obtained. |
| 4 | Scientific techniques, valid and relevant to the research question, are competently applied with consistent and clear evidence of an original/personal approach or are apparent in a sufficient range of literature resources and analysed with consistent and clear evidence of an original/personal approach to the data obtained. |

L Appreciation of causal links and variables in the environment

Achievement level

- | | |
|----------|---|
| 0 | There is no awareness of cause and effect or variables within the environment. |
| 1 | The candidate makes simplistic interpretations linking effects to single causes with little consideration of the complexities of variables or of controls in the investigation. |
| 2 | The candidate makes simplistic interpretations as related to cause and effect but there is some recognition that there may be other factors complicating the argument. |
| 3 | The candidate appreciates the complexities of the environmental topic and attempts to make reference to weaknesses in direct cause and effect interpretations. |
| 4 | The candidate is fully aware of the limits of the investigation and makes sensible suggestions of the ways in which variables might influence the results of the investigation. |

GEOGRAPHY

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

An extended essay in geography provides a candidate with an opportunity to apply a range of skills in the study of a rural or urban environment. The geographical nature of an extended essay is characterized by an emphasis on spatial processes and the application of geographical theory and techniques.

Choice of Topic

It is important that the topic of the essay has a geographical emphasis and is not more closely related to another discipline. It is the task of the supervisor to ensure that the research question leads the candidate along a path that utilizes appropriate geographical sources, and that encourages the application of relevant geographical concepts, theories or ideas. Many good essays pose a question, but it is equally acceptable to examine an issue or to investigate a problem.

The scope of the essay should not be too broad; such essays are rarely successful. The best research questions are well focused, thus encouraging analysis in depth rather than breadth. It is also important that the geographical context of the essay is well established early in the essay.

Investigations carried out at a local scale invariably score the highest marks. This narrow focus discourages an over-reliance on published materials and encourages original research. Essays conducted in an area which is familiar and accessible to the candidate have a much greater chance of achieving success through a more personal involvement which, in turn, encourages a greater in-depth study.

Extensive data collection is the foundation of a good geography essay and, if done properly, it gives the candidate the scope for the type of in-depth analysis which characterizes the very best pieces of work. It is rare for an essay which is based entirely on published texts to score highly.

The following examples of titles for geography extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

The influence of aspect on residential land use in San Salvador, El Salvador is better than Residential land use in Central America.

A study of the seasonal variation in the transport network of Jersey, United Kingdom is better than The study of transport networks.

The influence of distance on agricultural patterns in New South Wales, Australia is better than Influences on agricultural patterns.

The effect of location on the characteristics of kiosks in Nairobi, Kenya is better than The effect of location on retail outlets.

High school catchment areas in Denver, USA: their spheres of influence is better than High school catchment areas in the USA.

To what extent do temperature changes over the past 150 years in Vienna support evidence for global warming? is better than Evidence for global warming.

Treatment of the Topic

The geographical context in which the research is being conducted should be described, usually with the aid of a locational map.

Geographical data is of little value unless it is analysed, using appropriate geographical, statistical and/or graphical techniques, and then evaluated. Valid techniques which are characteristic of geographical enquiry could include: the use of interaction and gravity models, network analysis, correlation techniques, measures of dispersion, sampling techniques or standard error calculations. The element of personal evaluation is important when interpreting the results of data analysis. The candidate should show an understanding of the results and be able to interpret them with reference to the research question.

Illustrations and Maps

It is essential that the extended essay be supported by appropriate methods for illustrating information/data, such as diagrams, sketch maps, tables and graphs. Wherever these are derived from other sources, these sources must be acknowledged.

The inclusion of maps should constitute an essential part of any geographical extended essay and good essays usually have maps near to the start to place the investigation in a clear geographical context. All maps should give an indication of orientation and scale and include a key. Any maps derived from other sources should be clearly marked with the map reference number and the publisher and the origin should be given of any base maps that have not been constructed by the candidate. The sole use of photocopied maps or maps printed from commercial computer software is rarely effective and provides little evidence of map skills.

The use of sketch maps and labelled diagrams as support information is highly encouraged. Maps constructed by the candidate on the computer are to be encouraged and it is a good idea to state the software program used.

Photographs, if included, should be essential to the essay and not included merely for decoration. As such, they should be labelled or carry a written explanation of whatever points they are intended to illustrate.

All illustrative material (maps, photographs, field sketches, charts, etc.) should be located at relevant points in the body of the essay.

Large data tables, large published maps referred to in the text, or an extensive series of calculations should be included in the appendix, but only if they support the text of the essay. It is not necessary to include field notes in the appendix.

Development of the Essay

In geography the most successful essays develop the research question through the formulation of hypotheses. For example, if the topic was the analysis of temperature change with distance from Lake Geneva, suitable hypotheses could be:

- the daily range of temperature increases according to distance from the lake
- the influence of the lake on temperatures is more marked in winter than in summer.

Each of these hypotheses gives the candidate enough scope to collect a range of appropriate and detailed data, and to test established ideas in a local context. Such an essay could investigate both of these ideas or concentrate on one in greater detail.

The supervisor will need to help ensure that the hypotheses are entirely appropriate to the topic and lead the candidate along the appropriate investigative channels.

Descriptive essays in geography do not generally score well. Good essays invariably present a detailed analysis in the form of charts, diagrams, tables and maps which have been generated from the information collected. Some written analysis must also be included in the form of a clear explanation and interpretation of what is illustrated by maps, graphs, etc. in the context of the research question. This section should provide the evidence on which the candidates will base their argument and evaluation in order to support or reject their original ideas. In geography, this evidence is usually in the form of temporal or spatial patterns. For example, in the case of temperature changes according to distance from a lake, the findings might reveal a positive correlation between distance from the lake and diurnal temperature range, with a few anomalies.

In many cases this is the crux of the essay, since appropriate methods of analysis and accurate interpretations will ensure successful development of the essay. Here the supervisor plays a vital role in helping the candidates to select appropriate geographical techniques of analysis.

Ideas or questions put forward at the start of the essay should be re-examined and a clear and logically sequenced argument should be constructed. The argument should illustrate the point the candidate is making and support it with evidence from the preceding analysis. A good essay will always examine this evidence in a critical manner and question the validity of the findings. In the case of temperature changes with distance from the lake, this may involve an attempt to explain the anomalies or to question whether or not other factors such as aspect, altitude or degree of urbanization play as important a role as distance. In this way, the essay should present a balanced argument, in which the evaluation of the information is personal but unbiased. It may be that the results of the analysis are unexpected or do not seem to fit established patterns. If so, the candidate should not be daunted but should meet the challenge. Some of the best essays have emerged when candidates have had to reconsider and re-evaluate their original ideas in the light of unexpected results.

The Conclusion

Hypotheses or ideas, if not fully accepted, may be modified and good research will inevitably unearth new questions or reveal areas of the research question that were not fully explained and that may need further investigation. The conclusion may suggest briefly which avenues this further investigation might pursue.

In the case of temperature changes according to distance from a lake, the conclusion could, for example, point out that the temperature readings did not take altitude into account and that the essay would have been more successful if these had been corrected to lake level. Such a self-critical approach adds to, rather than detracts from, the essay, since an awareness of the need to make constant adjustments and corrections and to recognize shortcomings is an essential element of research.

Assessment Criteria

J **Relevance to the discipline of geography, and use of appropriate subject language and terminology**

Achievement level

- 0** The essay is not relevant to the discipline of geography.
- 1** The essay is mostly relevant to the discipline of geography but is uninspiring. Subject language and terminology are used in a limited manner.
- 2** The essay is relevant to the discipline of geography. Subject language and terminology are used competently.
- 3** The essay is relevant to the discipline of geography and is imaginative and engaging. Subject language and terminology are used very effectively.

K **Appropriate sources of geographical information (e.g. primary data, published data, maps, photographs and other secondary sources)**

Achievement level

- 0** Appropriate sources of geographical information have not been used.
- 1** Appropriate sources of geographical information have been used. The information has been poorly selected and/or lacks sufficient detail. The candidate demonstrates little understanding of its value, limitations and reliability.
- 2** Appropriate sources of geographical information have been used. The information has been competently selected and is generally detailed. The candidate demonstrates some understanding of its value, limitations and reliability.
- 3** Appropriate sources of geographical information have been used. The information has been well selected and is detailed. The candidate demonstrates a clear understanding of its value, limitations and reliability.

L Understanding and application of relevant geographical concepts, issues, theories or ideas

Achievement level

- 0** No understanding is demonstrated of geographical concepts, issues, theories or ideas, **or** the ones used are irrelevant.
- 1** Some understanding is demonstrated of geographical concepts, issues, theories or ideas which are relevant but basic. They have been applied in a limited or incomplete manner. Hypotheses, where relevant, are poorly formulated.
- 2** A good understanding is demonstrated of geographical concepts, issues, theories or ideas. They are relevant and have been applied in a competent manner. Hypotheses, where relevant, are adequately formulated.
- 3** An excellent understanding is demonstrated of geographical concepts, issues, theories or ideas. They are detailed, central to the research question and have been applied in a consistent and even imaginative manner. Hypotheses, where relevant, are clearly formulated.

M Methods of analysis, interpretation and evaluation appropriate to geographical enquiry

The way in which candidates utilize statistical methods, maps, charts, tables, diagrams and/or photographs to analyse, interpret and evaluate information.

Achievement level

- 0** No analytical methods have been used **or** they are inappropriate to the research question, **or** the essay is entirely narrative/descriptive.
- 1** Analytical methods used are appropriate to the research question but they are either limited in scope or incorrectly applied, with poor interpretation and evaluation. Hypotheses, where relevant, are poorly tested.
- 2** Analytical methods used are appropriate to the research question and competently applied, with clear interpretation and evaluation. Hypotheses, where relevant, are adequately tested.
- 3** Analytical methods used are appropriate to the research question and show creativity and sophistication in their application with very good interpretation and evaluation. Hypotheses, where relevant, are thoroughly tested and, where necessary, revised.

HISTORY and HISTORY OF THE ISLAMIC WORLD

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

An extended essay in history or history of the Islamic world (for the rest of this section, 'history' will be taken to include both subjects) should provide candidates with the opportunity to undertake an in-depth study of a limited topic containing a valid historical question.

Choice of Topic

The words 'valid historical question' in the introduction are meant to imply that the topic chosen must lend itself to systematic investigation in line with the published assessment criteria, and must be a topic to do with the human past.

An extended essay is an in-depth investigation of a focused issue, and the systematic and disciplined development of an argument or thesis following the conventions of scholarly writing. An extended essay in history is not a narrative exposition, a descriptive composition, a biographical chronicle or a factual report.

It is not a requirement for the topic of an extended essay in history to be chosen from the IB history programme, or related in any way to the regional option being studied by higher level candidates.

The topic chosen must avoid a focus on the time span of the last ten years. One reason for this is that hindsight is seen as important in history; history and current affairs are different. However, history can aid understanding of recent happenings, and some reference in extended essays in history to recent developments and happenings, if relevant and done effectively, can contribute to demonstrating historical understanding.

The topic chosen should provide opportunities for some critical analysis of sources. Topics which are entirely dependent on summarizing general secondary sources (such as textbooks and encyclopedias) and topics likely to lead to an essay which is essentially narrative or descriptive in nature should be avoided.

Choosing a broad topic which covers a long period of time is unlikely to result in a successful essay. Restricting the scope of the essay will help to ensure a clear focus. It will provide opportunities for demonstrating not only knowledge, but also critical analysis, and historical judgement and understanding.

The following examples of titles for history extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

Explanations of the collapse of the Mayan civilization **is better than** *The Mayan civilization.*

Varying interpretations of the Salem witch trials **is better than** *Witch trials in North America.*

What does 'Mein Kampf' tell us about Hitler? **is better than** *Adolf Hitler.*

Use of the visual arts in fascist propaganda **is better than** *Fascist propaganda.*

An analysis of the first five-year plans of Mao Zedong and Stalin **is better than** *Five-year plans in the USSR and China.*

The role of the Pan-African movement in the downfall of Kwame Nkrumah in 1966 **is better than** *Kwame Nkrumah.*

Treatment of the Topic

Candidates must choose a research question that is susceptible to effective treatment within the word limit and is not of a trivial nature. Research questions that do not allow a systematic investigation that demonstrates critical analysis, historical judgement and understanding, are unlikely to be suitable in history. In some instances, there may be too few sources available to permit such an investigation; sometimes there may be adequate sources but no possibility of achieving the other requirements.

Many different approaches to the research question can be appropriate in history, including:

- use of primary source material for a case study or local history project, possibly leading to a comparison of local and national developments
- using primary and secondary sources in order to establish and then appraise varying interpretations
- studies involving critical analysis and interpretation of documents, including important acts and treaties
- analysing sources (primary and/or secondary; historical and/or popular publications) in search of changing views, over time, of particular happenings or developments
- explaining and considering varying interpretations identified through a study of secondary sources
- collecting and analysing data from family, friends and/or neighbours in order to establish past happenings, again possibly leading to a comparison of local and national happenings.

Some examples of titles and approaches chosen in the past are:

- Title: *Varying interpretations of the Salem witch trials*
Approach: Background reading, enabling identification and explanation of two dominant theories as to why the trials took place; appraisal of the merits of the two theories using data obtained about the accused and the accusers.
- Title: *The influence of the national socialist ideology on the German school system, 1937-1939.*
Approach: Reading to make possible a summary of National Socialist ideology and curriculum proposals; use of primary sources (teachers' records) to establish how far the proposed changes were put into practice in one school, 1937-1939.
- Title: *The 1975 Treaty of Waitangi Act and the Waitangi tribunal: how far did they faithfully pursue the aims and the text of the 1840 Treaty of Waitangi?*
Approach: General reading for historical introduction. Analysis of documents mentioned in the title, and consideration of views of historians, in order to produce an informed and well-founded historical judgement.
- Title: *Cuba's changing view of the 1962 missile crisis*
Approach: General reading for historical introduction. Reading as many Cuban sources as possible (primary and secondary) to establish and explain changes in views of the 1962 missile crisis in the 1960s, 1970s and 1980s.

Candidates need to be able to evaluate relevant sources and data with skill and understanding. In history, effective evaluation can be demonstrated through considering, for example:

- the origins of sources used (who were the authors? what were their intentions? is it likely that any of the sources have been altered?)
- the usefulness and reliability of the sources.

The value and reliability of sources should not be taken for granted in extended essays in history, especially when the authenticity of some of the sources is questionable.

Candidates should aim to produce a convincing argument which addresses the research question, and is well developed, well organized and clearly expressed. Good argument, whatever the topic of the essay, will have these qualities. On the other hand, opportunities for evaluation will vary with the topic; clearly some topics will be more controversial in nature than others and so offer more opportunities for consideration of different interpretations. In history it is, of course, particularly important that any evaluation is not subjective, and candidates will also gain more credit for assessing varying interpretations than they will for reporting them.

Assessment Criteria

J Historical sources

Achievement level

- | | |
|----------|---|
| 0 | The candidate demonstrates no awareness of the value and limitations of the sources used. |
| 1 | The candidate demonstrates some awareness of the value and limitations of the sources used but without explicit references to examples. |
| 2 | The candidate demonstrates some awareness of the value and limitations of the sources used but with only limited reference to particular sources, their usefulness and reliability. |
| 3 | The candidate demonstrates a good awareness of the value and limitations of the sources used, with detailed reference to particular sources, their usefulness and reliability. |

K Historical knowledge and understanding

Achievement level

- | | |
|----------|--|
| 0 | The candidate demonstrates no satisfactory knowledge or understanding relevant to the research question. |
| 1 | The candidate demonstrates some relevant historical knowledge and understanding. |
| 2 | The candidate demonstrates a sound level of historical knowledge and understanding. |
| 3 | The candidate demonstrates a very good level of historical knowledge and understanding. |

L Selection and application of historical information/evidence

Achievement level

- 0** The supporting information/evidence is completely irrelevant to the research question.
- 1** The argument is supported by information/evidence which is only partially relevant to the research question.
- 2** The argument is generally supported by relevant information/evidence.
- 3** The argument is fully substantiated by relevant information/evidence.

M Critical analysis and historical judgement

Achievement level

- 0** The essay lacks critical analysis and historical judgement.
- 1** The essay demonstrates some, but limited, critical analysis and historical judgement.
- 2** The essay demonstrates a competent level of critical analysis and historical judgement.
- 3** The essay demonstrates very good critical analysis and balanced historical judgement.

INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

An extended essay in information technology in a global society (ITGS) provides a candidate with an opportunity to research a topic of personal interest in the field of IT and its effects on individuals, institutions/organizations or communities.

Choice of Topic

The chosen topic may be stimulated, for example, by work in the class, by current events, by issues of contemporary debate, by discussion, by private reading and/or reflection, or by belief systems not previously encountered by the candidate.

The topic chosen must have a focus within the field of ITGS and must not be primarily a topic within another subject discipline. The use of spreadsheets, databases, the Internet or computers in general does not automatically imply that the topic falls within the field of ITGS.

If IT is used in a peripheral manner, such as in a survey, exchanging data, in an analysis or in the development of an application, consideration should be given to registering the extended essay in the relevant subject and not in ITGS.

Candidates are encouraged to develop and explore a research question in a disciplined and imaginative way, investigating issues requiring ethical consideration in depth **together with** reference to the social (e.g. economic, political, cultural, legal, environmental or historical) significance arising from the interaction of IT with society.

The following examples of titles for ITGS extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (illustrated by the second title).

*Teleworking: an analysis of its impact on domestic life **is better than** IT in the home.*

*An investigation assessing the degree to which IT can meet the needs of physically impaired individuals **is better than** IT and the physically impaired.*

*A comparative study of the effectiveness of the laws of Colombia and China regarding the protection of personal data **is better than** IT and privacy.*

A study of the impact of virtual reality on people's leisure is better than Virtual reality.

Gender: an analysis of the degree of bias of the Internet towards male users is better than Boys on the Web.

An investigation into how the developments of IT can help reduce the disparity between 'information-poor' and 'information-rich' nations is better than IT and a global society.

An analysis into the frequency and effects of hacking on local businesses is better than Hacking.

An investigation into the ethical issues of war games is better than Computer simulations.

A discussion of the issues surrounding the policing of the Internet is better than IT and abuse.

A study of the development and adaptation of network protocols is better than Networks.

An evaluation of the contribution of IT to the defence of human rights is better than IT and people.

An investigation into the use of, and ethical consequences arising from, robots in surgery is better than Robots and medicine.

A study into the use of IT in the teaching of mathematics to elementary school students is better than IT and mathematics.

Treatment of the Topic

An extended essay in ITGS is not intended as a vehicle to demonstrate IT skills, but should support the acquisition of research skills as the result of independent research. A candidate may use his/her experience and knowledge of the various 'tools' of IT.

The content is meant to be an expression of views by the candidate and others, on the basis of research of a particular IT issue that impacts on themselves and others. Points raised in the essay are open to criticism, which is perhaps one of its intentions.

An extended essay may refer to various IT tools, and even use them in its final presentation, but details of, for example, database programming, network architecture, programming or mark-up codes (e.g. HTML), specific operating systems/applications or how computer hardware deals with data should not be the focus of the essay.

Assessment Criteria

J Information technology issues requiring ethical consideration

Achievement level

- | | |
|----------|---|
| 0 | The candidate has not reached a standard described by any of the descriptors given below. |
| 1 | The candidate identifies correctly at least one issue. |
| 2 | The candidate describes correctly at least one issue. |
| 3 | The candidate describes correctly in detail at least one issue. |
| 4 | The candidate explains correctly in detail at least one issue. |

K Social significance of the research question regarding individuals and/or society as a whole, using appropriate IT terminology

Social significance can include economic, political, cultural, legal, environmental and/or historical factors.

Achievement level

- | | |
|----------|--|
| 0 | The candidate has not reached a standard described by any of the descriptors given below. |
| 1 | The candidate identifies correctly at least two aspects of social significance, using appropriate IT terminology. |
| 2 | The candidate describes correctly at least two aspects of social significance, using appropriate IT terminology. |
| 3 | The candidate describes correctly in detail at least two aspects of social significance, using appropriate IT terminology. |
| 4 | The candidate explains correctly in detail at least two aspects of social significance, using appropriate IT terminology. |

L Solutions to problems arising from the research question

Achievement level

- | | |
|----------|--|
| 0 | The candidate has not reached a standard described by any of the descriptors given below. |
| 1 | The candidate describes at least one solution in detail. |
| 2 | The candidate describes at least one solution in detail with an evaluation of its likely effectiveness. |
| 3 | The candidate describes at least two solutions in detail with an evaluation of their likely effectiveness. |
| 4 | The candidate compares at least two solutions in detail with an evaluation of their effectiveness. |

MATHEMATICS

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

An extended essay in mathematics enables candidates to demonstrate an appreciation of any aspect of the subject, whether it be:

- the applicability of mathematics to solve real and abstract problems
- the beauty of mathematics as in, for instance, geometry or fractal theory
- the elegance of mathematics in the proving of theorems as in, for example, number theory
- the origin and subsequent development of a branch of mathematics over a period of time, whether it be measured in tens, hundreds or thousands of years
- the links between different branches of mathematics and the powerful structures that enable many seemingly different problems to be solved by a single theory
- the way that a branch of mathematics has been born, or has flourished, as a result of technology.

These are just some of the many different ways that mathematics is both enjoyable and useful.

Choice of Topic

The extended essay may be written on any topic which has a mathematical focus and need not be confined to the theory of mathematics itself.

Candidates may choose mathematical topics from fields such as engineering, the sciences, or the social sciences as well as from pure mathematics. Statistical analyses of experimental results taken from other subject areas are also acceptable provided that they focus on the modelling process and discuss the limitations of the results; such essays should not include much non-mathematical detail. A topic selected from the history of mathematics may also be appropriate provided that a clear line of mathematical development is demonstrated. Concentration on the personal intrigues or lives of mathematicians is irrelevant and is unlikely to score on the subject assessment criteria.

It should be noted that the general assessment criteria give credit for the approach, analysis/interpretation and argument/evaluation applied to an appropriate research question. Candidates should avoid choosing a topic that gives rise to a trivial research question or one that is not sufficiently focused to allow appropriate treatment within the word limit. Candidates will normally be expected either to extend their knowledge beyond higher level, or apply at least higher level techniques to modelling in an appropriately chosen topic.

Examples of inappropriate topics might be:

- the duodecimal system
- taxi-cab geometry
- artificial intelligence.

The last of these examples is inappropriate in two ways: it is a topic more suited to computer science or physics and, more importantly, covers an area too great for treatment in an extended essay.

The following examples of titles for mathematics extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

Prime numbers in cryptography is better than Prime numbers.

The Hausdorff dimension of fractal sets is better than Fractals.

Continued fractions in birth-death processes is better than Continued fractions.

The proof of the law of quadratic reciprocity is better than C F Gauss: the mathematician.

The conditions under which the Newton-Raphson method fails is better than Iterative methods.

Using graph theory to minimize cost is better than Graph theory.

Treatment of the Topic

Whatever the title of the extended essay, candidates must apply good mathematical practice that is relevant to the chosen topic. Data must be analysed using appropriate techniques, arguments correctly reasoned, situations modelled using correct methodology, problems clearly stated and techniques at the correct level of sophistication applied to their solution. There must be sufficient explanation and commentary throughout the extended essay to ensure that the reader does not lose sight of the purpose of the essay in a mass of mathematical symbols, formulae and analysis.

The unique disciplines of mathematics must be respected throughout. Graphs and diagrams are often important and should be incorporated in the body of the essay, not relegated to an appendix. Lengthy printouts, tables of results and computer programs, however, should not be allowed to interrupt the development of the essay and should appear separately as footnotes or in an appendix. Proofs of key results may be included but proofs of standard results should either be omitted or, if they illustrate an important point, be included in an appendix.

Word count is seldom an important factor in a good mathematical essay. Concise, elegant mathematics supported by graphs, diagrams and important proofs that do not interrupt the development of the essay are encouraged. Clearly a word total in excess of 4000 will be penalized under general assessment criterion G, but there is no recommended minimum number of words. Mastery of appropriate concepts and a facility to present these in an effective way using mathematical means should be the aim.

Assessment Criteria

J Mathematical principles and/or terminology

Achievement level

- 0** Little or no evidence of mathematical principles and/or terminology is present.
- 1** Relevant mathematical principles and/or terminology feature but only at an elementary level.
- 2** Relevant mathematical principles and/or terminology feature but are given only limited emphasis.
- 3** Significant use is made throughout of relevant mathematical principles and terminology.
- 4** Relevant mathematical principles and terminology which demonstrate insight are employed effectively throughout.

K Mathematical methods and/or sources

Achievement level

- 0** The mathematical methods and/or sources employed have little or no relevance to the research question.
- 1** The mathematical methods and/or sources employed are appropriate to the research question but are of an elementary nature.
- 2** The mathematical methods and/or sources employed are appropriate and not of an elementary nature, but are not sufficiently sophisticated to allow the research question to be fully investigated.
- 3** Appropriate mathematical methods and/or sources are employed but are subject to some fundamental errors or omissions.
- 4** Appropriate mathematical methods and/or sources are employed effectively and correctly throughout the essay.

L Mathematical reasoning and communication

Achievement level

- 0** Little or no mathematical reasoning is applied to the research question.
- 1** Limited use is made of mathematical reasoning to pose and/or solve problems relevant to the research question.
- 2** Confident use is made of mathematical reasoning to pose and/or solve problems relevant to the research question, but there is little or no evidence of reflective thought.
- 3** Confident use is made of mathematical reasoning to pose and/or solve problems relevant to the research question, and there is clear evidence of reflective thought.
- 4** Confident use is made of mathematical reasoning to pose and/or solve problems relevant to the research question, and there is clear evidence of reflective thought with appropriate attempts at mathematical communication.

MUSIC

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

Extended essays in music offer the opportunity to undertake research into a topic of particular musical interest for the candidate. The candidate is encouraged to develop and explore in a disciplined and imaginative way a research question appropriate to the subject, and to arrive at a particular and preferably personal conclusion.

Music is the primary source material for the extended essay. Particular pieces of music, experienced via recordings, live performances, or concerts should be at the centre of each extended essay in music. The candidate should strive for a coherent verbal analysis and interpretation of one or more pieces of music in relation to the research question.

Absolute reliance on textbooks is discouraged and no extended essay in music should be based exclusively on textbooks. They should be consulted in so far as they may stimulate original ideas, provide models of disciplined, structured and informed approaches, and encourage direct and personal involvement with the essay topic.

Choice of Topic

The chosen topic may, for example, be inspired by aspects of the music programme, by local performances or concerts, or by the particular circumstances of cultures other than the candidates' own which they have encountered. Personal contact with composers and/or performers is strongly encouraged, as is a direct involvement in actual music-making. Thoughtful and focused discussion of the technical aspects of the musical pieces chosen, which is relevant to general topics, such as 'Computers and music', is essential to genuine investigation of research questions in music. However, such topics should be treated from both musical and critical perspectives, and should concentrate on the musical rather than the technological.

It is essential that the topic chosen is distinctively musical. It is quite in order, for example, for a candidate to explore a topical question relating to popular music, or jazz or blues, but the primary focus of the essay must be more concerned with the music itself than with the lives of the performers, the nature of the instruments used, or the lyrics.

In the subject of music, a research 'question' is sometimes not an accurate description of the task. Candidates should not force aesthetic or socio-cultural issues into a question format when the articulation of a clear and probing inquiry into an idea is more appropriate.

Examples of inappropriate essay titles might include:

The trombone: its evolution and its music (too broad)

The development of the oboe through the ages (too broad, without reference to musical examples)

Gender in music (issue or idea not clearly defined)

A comparison of rhythmic, notational and melodic experimentation in the middle ages and in the twentieth century (concept not directly related to musical examples).

Supervisors should strongly discourage candidates who are primarily interested in analysing text or lyrics, particularly of pop songs, from choosing these topics for extended essays in music.

Treatment of the Topic

The inclusion of appropriate reference material, such as music notations, audiotapes or other musical examples with music extended essays is encouraged in so far as the material is directly supportive of, and relevant to, the argument/evaluation.

In order to promote personal involvement in the extended essay the use of local and/or primary sources should be encouraged whenever possible. However it is appreciated that, in certain situations, candidates may not necessarily have access to primary musical sources. In such situations, in order not to restrict the topics which could be investigated, recordings, tapes and videos of a high quality are considered acceptable sources.

It should be noted that the IB music programme includes components which require performance and/or composition. The extended essay in music has a different purpose, in that the focus should be clearly on a verbal response to a research question.

Appropriate resources for music include books, textbooks, scores, interviews, recordings, and live performances or concerts of the music under study. Whereas general assessment criterion B gauges the relevance of the resources to the topic or question, the subject assessment criteria evaluate the depth and extent to which the candidate uses these resources.

All sources, including recordings and scores, must be appropriately documented in the text and in the references and bibliography which accompany each extended essay in music.

Candidates are expected to evaluate critically the resources consulted during the process of writing the essay. Which sources are vital to the support of candidates' ideas, opinions and assertions? Which ones do not contribute to the analysis? Subject assessment criterion L specifically assesses candidates' abilities to describe and evaluate the most specialized technical features of the examples of music under discussion.

Assessment Criteria

J Choice of music and method of study

Achievement level

- 0** The candidate has chosen music for study which does not involve direct contact with music and musicians via recordings, or live performances and concerts, or personal contact with composers or performers, or fieldwork in a culture other than the candidate's own.
- 1** The candidate has chosen music for study which involves some direct contact with music and musicians via recordings, or live performances and concerts, or personal contact with composers or performers, or fieldwork in a culture other than the candidate's own.
- 2** The candidate has chosen music for study which involves extensive contact with music and musicians via recordings, or live performances and concerts, or personal contact with composers or performers, or fieldwork in a culture other than the candidate's own.

K Use of appropriate primary and secondary resources

Achievement level

- 0** The candidate relies solely upon secondary resources (textbooks and the comments of other musicians) in the discussion of the music chosen.
- 1** The candidate relies primarily upon secondary resources (textbooks and the comments of other musicians) in the discussion, and indicates a personal point of view, though the interpretation of the resources may be weak.
- 2** The candidate uses both secondary (textbooks and the comments of other musicians) and primary resources (scores, recordings, performances, interviews) in the discussion, and the interpretation of these materials illustrates and justifies a personal point of view.
- 3** The candidate uses both secondary (textbooks and the comments of other musicians) and primary resources (scores, recordings, performances, interviews) with great skill, and the interpretation of these materials illustrates and justifies a personal point of view with sophistication and skill.

L Description and analysis of the technical aspects of music in terms of melody, harmony, rhythm, texture, tone colour, and lyrics or text as appropriate

Achievement level

- 0** The candidate does not describe, analyse or evaluate any technical aspect of the music chosen.
- 1** The candidate attempts to describe some technical aspects of the music, but the techniques of analysis are inappropriate, incorrectly applied, or the evaluation of these aspects is simply wrong.
- 2** The candidate has described or analysed the technical aspects of the music chosen using appropriate and correctly applied techniques, and the evaluation of these aspects is valid and convincing.
- 3** The candidate has described, analysed and evaluated the technical aspects of the music chosen, with sophistication and skill; the techniques used show an outstanding knowledge of the music chosen for study.

M Historical, social and cultural context

Achievement level

- 0** The music chosen for study is not placed in its historical, social or cultural context.
- 1** The music chosen for study is very loosely placed in its historical, social or cultural context with little or no attempt at relating the music with its environment. Very few of the relevant links have been noted.
- 2** The music chosen for study is generally placed in its historical, social or cultural context with an attempt at placing the music in its environment. Some of the relevant links have been noted. However, the context and these issues have been analysed superficially.
- 3** The music chosen for study is placed in its historical, social or cultural context with a good discussion of the music in its particular environment. These issues have been analysed with some care, and most, if not all, of the relevant links have been noted.
- 4** The music chosen for study is directly and clearly placed in its historical, social or cultural context with a sophisticated discussion of the music in its appropriate environment. These issues have been carefully, critically and systematically analysed, and most of the relevant links have been thoroughly explored.

PEACE AND CONFLICT STUDIES

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

Extended essays in peace and conflict studies provide candidates with the opportunity to undertake an in-depth study of a limited topic in this field. Essays should allow candidates to develop and show research, interpretative and presentational skills.

Candidates who are considering registering an extended essay in this subject, which is a school-based syllabus, are strongly advised to study carefully a copy of the syllabus, obtainable from IBCA, before making a final decision. The syllabus gives a clear idea of the scope and content of the subject and will help candidates to decide whether their choice of topic is appropriate.

Choice of Topic

The choice of topic must be such as to ensure that the various assessment criteria can be satisfied. Candidates are advised to avoid topics that are too broad in scope to permit a study in depth within the prescribed word limit. A limited topic, thoroughly researched and with a clear focus, is preferable to a broad topic, which can only be examined superficially.

There are many areas of human interaction in which conflict and/or peace can be observed, but purely descriptive essays should be avoided. Topics drawn from more dynamic situations allow the process of change to be studied and the candidate to assess the viability of peace being achieved or maintained.

When choosing a topic the candidate should ensure that a variety of sources is available. Candidates may use journalistic or visual/pictorial material, or data collected from interviews, but their essays should not be based solely on such sources. In particular, they should realize that extended essays in this subject will be expected to show that the candidate possesses a knowledge and understanding of the different theories about the causes of peace and conflict (see assessment criterion K).

The following examples of peace and conflict studies extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

The debate about the effects of television violence on pre-teenagers: social and legislative safeguards and their effectiveness **is better than** *Violence on TV.*

Maori non-violent struggles for their land is better than The political position of the Maori people.

Racism in X and proposals for its reduction is better than A study of racism.

Conscientious objection in Switzerland: a study of its history, the human rights issues, the effects acceptance would entail, and of its political support is better than The case for conscientious objection.

Treatment of the Topic

Peace and conflict studies involves differing interpretations of situations, events, causes and solutions. The better essays will examine a wide variety of opinions, assess their strong and weak points, and include an element of personal evaluation.

Many essays will involve topics of which candidates have direct experience, to which they have easy access via family or friends, or with which they have some political, philosophical or cultural affinity. This is not discouraged but, in such cases, care must be exercised to maintain the academic standards of essay writing, particularly with reference to sources, contentious issues and conclusions. Several successful essays of this type have been written within the framework of a school or local community. Candidates have had no difficulty in finding ample source material, much of it being primary source material.

Peace and conflict studies is an interdisciplinary subject, and essays should reflect this. For example, data may be drawn from statistics, geography, sociology, psychology, history, economics, politics and journalism. Such data must be integrated, and shown to be relevant to the scope of the peace and conflict studies syllabus.

Assessment Criteria

J The topic within a wide understanding of peace in society

**Achievement
level**

- 0** The candidate provides no contextual information.
- 1** The candidate provides little, inappropriate, or too much contextual information.
- 2** The candidate provides a fair description of the context of the topic.
- 3** The candidate provides a good and appropriate description of the context of the topic.

K Knowledge and understanding of theories about the causes of peace and conflict

**Achievement
level**

- 0** The candidate does not examine the relevant theories about the causes of peace and conflict.
- 1** The candidate demonstrates very limited knowledge and understanding of theories about the causes of peace and conflict.
- 2** The candidate demonstrates a satisfactory knowledge and understanding of theories about the causes of peace and conflict.
- 3** The candidate demonstrates a comprehensive knowledge and understanding of theories about the causes of peace and conflict.

L Awareness and understanding of the differing roles, interpretations and actions of all conflicting parties

Achievement level

- 0** The candidate makes no attempt to understand the roles, interpretations and actions of the conflicting parties, or substantially misrepresents them.
- 1** The candidate demonstrates little awareness of the differing roles, interpretations and actions of all conflicting parties, and fails to reach well-informed and substantiated opinions about them.
- 2** The candidate demonstrates satisfactory awareness of the differing roles, interpretations and actions of all conflicting parties, and shows some ability to reach well-informed and substantiated opinions about them.
- 3** The candidate demonstrates a sound grasp of the differing roles, interpretations and actions of all conflicting parties, and reaches well-informed and substantiated opinions about them.

M Solutions to conflict situations

Achievement level

- 0** The candidate makes no attempt to examine possible solutions to conflict situations.
- 1** The candidate demonstrates only limited ability to examine possible solutions to conflict situations.
- 2** The candidate demonstrates a satisfactory ability to examine possible solutions to conflict situations.
- 3** The candidate presents a clear and realistic examination of possible solutions to conflict situations.

PHILOSOPHY

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

Extended essays in philosophy present the candidate with an opportunity to undertake a philosophical investigation into a topic of special interest. The candidate is encouraged to engage in serious, personal thought and to develop and explore in a disciplined and imaginative way a specific philosophical question appropriate to the subject, and to arrive at a clear conclusion.

Choice of Topic

The chosen topic may be stimulated, for example, by work in the class, by current events, by issues of contemporary debate, by discussion, by private reading and/or reflection, or by conceptual features of belief systems not previously encountered by the candidate.

A precisely circumscribed topic should be selected, in order that it can be treated thoroughly. For example, it may be preferable to choose as a starting point a specific thesis rather than a general one, or certain of the ideas of one philosopher rather than several, or a single text by a philosopher rather than the whole of his/her work.

A topic should be reconsidered or amended if it is interdisciplinary in nature and/or is not directly related to philosophy.

The following examples of titles for philosophy extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

An analysis of John Rawl's procedure of justifying principles of social justice is better than Philosophical views of social justice.

The notion of freedom of speech in Spinoza's 'Theologico-Politico Treatise' is better than Ethics in the seventeenth century.

Brahman: the ultimate reality of Sankara's 'Advaita Vedanta' is better than Philosophical implications of the Hindu scriptures.

A study of the sense-datum theory is better than Perception.

Change and continuity: a critical assessment of Herbert Marcuse's views on art and aesthetics is better than Philosophical aspects of art and aesthetics.

*A critical analysis of the materialist conception of history in 'The German Ideology' is **better than** Dialectical materialism.*

*Maya and Avidya: the creative sources of the world manifestation – a study of Indian philosophy in the Upanishad is **better than** Mahayana buddhism.*

*Doing versus being: language and reality in the Mimamsa school of Indian philosophy is **better than** Language and the nature of reality.*

*An examination of the role played by reason in Anselm's investigation of the concepts of predestination and free will is **better than** Anselm's exploration of the mysteries of faith.*

Treatment of the Topic

Clarity, coherence of ideas and attention to detail are necessary conditions for an effective treatment of a philosophical topic in an extended essay. Lucid understanding of the problem/s should be demonstrated, and the proposed solution/s should be logical and well structured. Counter claims or objections should be envisaged, addressed and, if possible, rebutted.

While irrelevance must be avoided, the wider implications of the philosophical issues raised should be explored to an appropriate degree, and an awareness should be evident of the connections between such issues and more universal concerns of human life.

The argument should be cogent, rational, and economical in expression, and should be supported by relevant, and if possible, original examples. Diagrams may also be an effective means of illustrating salient points.

Some guidance may be gained regarding the qualities expected of a philosophy extended essay by considering the case of an essay on Hume's *'Theory of Knowledge'*. A candidate might gain credit in accordance with the general assessment criteria for minimally identifying, distinguishing and explaining matters of fact and relations of ideas, impressions and ideas, certainty and probability, and so on. This might be termed general or discriminatory analysis. A detailed and extensive philosophical analysis of such distinctions might gain further credit in relation to subject assessment criterion K. To achieve the higher levels a candidate's analysis would have to include some critical treatment of the philosophical difficulties arising out of Hume's distinctions and account of knowledge.

Assessment Criteria

J Basic philosophical issues arising out of the research question, and philosophical insight

Achievement level

- 0** The research question is unsuitable for philosophical treatment.
- 1** The research question is appropriate but there is little or no awareness of its philosophical significance.
- 2** The candidate shows satisfactory to good awareness of the philosophical issues arising out of the research question.
- 3** There is clear identification and in-depth exposition of the basic philosophical issues, and the candidate shows a high degree of philosophical insight/awareness of themes and/or philosophers' views.

K Themes, basic concepts and arguments

Achievement level

- 0** The candidate fails completely to identify the philosophical themes, basic concepts and arguments.
- 1** The candidate gives a bare summary of the themes, basic concepts and arguments, but fails to examine arguments or attempt critical analysis of concepts.
- 2** Generally satisfactory philosophical analysis of themes and basic concepts, and examination of the validity of arguments.
- 3** Good, detailed critical and philosophical analysis of themes, basic concepts and arguments.
- 4** In-depth and extensive critical philosophical treatment of themes, basic concepts and arguments. Anticipating rebuttal, the candidate has attempted to develop his/her own arguments and counter-arguments.

L Personal engagement with the issue/s and awareness of the implications of personal view/s

Achievement level

- 0** No personal engagement, and no personal views expressed.
- 1** The candidate expresses mostly relevant personal views but without justifying them.
- 2** The candidate expresses relevant personal views and attempts to justify them.
- 3** The candidate expresses relevant personal views and shows clear awareness of their significance.

M Language and style

Achievement level

- 0** The language and style are inappropriate throughout. For example, a polemical style, flowery language and/or anecdotal/biographical material (unless centrally relevant) are used. There is vagueness and a lack of cohesiveness in sentence and paragraph structure.
- 1** Generally acceptable style and correct use of philosophical terms, well-structured sentences and sensibly organized paragraphs.
- 2** High to outstanding level of writing throughout: maturity and sophistication of vocabulary, excellent organization of the essay, well-chosen transitions, clarity and absence of ambiguity. There is full control of the language used.

PHYSICS

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

An extended essay in physics provides a candidate with an opportunity to apply a range of skills while researching a topic of personal interest in the field of physics. The physical nature of an extended essay is characterized by a particular physical emphasis within a more general set of scientific criteria. The extended essay in physics must be a research paper involving an hypothesis or a model, or a critical analysis which demonstrates argumentation, comparison, or the extraction of relevant information or data.

Choice of Topic

It is important that the extended essay has a clear emphasis on physics and is not more closely related to another subject. A physics extended essay should therefore have a basis in physical theory and emphasize the essential nature of the subject. Although similar criteria apply to all extended essays in the experimental sciences, for an extended essay registered in physics, the topic chosen must be approached from the viewpoint of physics. An extended essay in an interdisciplinary area such as materials science will, if registered as a physics extended essay, be judged on its physics content, not its chemical content.

The purpose of the essay is not principally to inform the reader about a specific topic, nor should it be a digest of the latest discoveries in physics. The candidate must be personally involved and not simply an informant.

Some topics may be unsuitable for investigation because of safety issues. For example, experiments involving dangerous or carcinogenic substances, radioactive materials, lasers, microwaves, UV light, noise or heavy equipment should be avoided unless adequate safety apparatus and qualified supervision is available. Typical experiments done in class, not suitable in themselves for an extended essay, can be a source of good topics.

Candidates should choose a well-focused, well-defined and realistic topic. Broad survey topics, for example, investigations into black holes, gravity or the fate of the universe will not permit the candidate to discuss conflicting ideas and theories nor to produce an in-depth personal analysis. Also, by definition, some topics are not suitable for an extended essay in physics, which is an experimental science with a specific approach and techniques. Examples of unsuitable research topics are:

- *The unknown forces of pyramids*
- *Physics and God's existence*
- *Extrasensory perceptions*

The following examples of titles for physics extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

Wind power: a clean source of energy? is better than Alternative energy sources.

The electronic control systems in a car engine is better than Applications of microelectronics.

Orbital determination of a minor planet is better than Gravitation.

On blowing bubbles in liquid: effects of detergent on surface tension is better than Surface tension in liquids.

Does the frequency of light affect the resolution of the eye? is better than How well do we see in different lights.

Earthquakes as a self-organized critical process is better than Plate tectonics.

The investigation and analysis of the modes of vibration of a guitar string is better than Wave theory.

Fluid fingers and arms of lightning: applications of fractals in physics is better than Fractals in physics.

Can background radiation be reduced by screening? is better than Radiation in the atmosphere.

A comparison of glass and perspex as materials for building a greenhouse is better than The insulating properties of different materials.

The variation in resistance of a wire subjected to different strains is better than Measuring the resistivity of different materials.

The use of interference fringes to measure small displacements is better than Making interference patterns.

The development of a simple scintillation counter and its use to measure radon 222 in the environment is better than Radon in the environment.

In first-hand experimental essays candidates should choose sensible and feasible experiments that do not require extensive lengths of time for the construction of apparatus. Highly sophisticated instruments are not required and in some cases they can impose limitations and hinder the understanding of a phenomenon. Successful experiments will produce relatively rapidly the data necessary for a solid analysis.

The domains of aerodynamics and hydrodynamics are theoretically and experimentally very demanding; for example, the construction of wind tunnels can be problematic and time consuming. A topic within these domains must be chosen and defined very carefully.

Physics applied to sports can be a source of excellent topics although the acquisition of sufficient useful data can sometimes be problematic.

Treatment of the Topic

Every extended essay in physics will involve some research into the background or theory of the topic selected. However, extended essays in physics may then vary. Candidates may choose any of the following approaches:

- **experimental:** design and implementation of an experiment, then personal collection and analysis of the data
- **data-based:** location and extraction of raw or processed data, not collected directly by the candidate, which is then further refined and analysed
- **theoretical:** development of a quantitative or semi-quantitative description of some physical phenomenon, exercise of the model, predictions about its behaviour and limitations
- **survey:** formulation of a cohesive, ordered, analytical and supported (qualitative and quantitative) discussion of the topic
- **combination:** some combination of the above.

All extended essays in physics should summarize the scope and limitations of the work undertaken. This always includes analysis of any experimental design, uncertainties and precision of data, mathematical techniques, relationships with theoretical models and reliability and quality of sources. The essay content and development should bear directly on the evaluation of a research question, most appropriately in the form of a test of a hypothesis.

Experimental essays offer an opportunity to display the candidate's own critical thinking skills in a more discernible fashion, but experimental work is not a requirement for a physics extended essay.

Any experimental work which forms part of a physics extended essay should be adequately described to allow the work to be repeated by others, who should achieve similar outcomes and conclusions. Particular care should be taken with data obtained through secondary sources. Candidates must scrutinize such data and the experimental design with the same care that they would apply to data which they themselves have directly collected. A careful scrutiny of research procedures could reveal serious flaws in experimental design or in data collection that invalidate the results in whole or in part, or at least limit the interpretation.

If a computer simulation of a theoretical model is used, the algorithms developed or employed should be thoroughly analysed and simulation outcomes compared with reality to check validity. Charts or code fragments may be used in the body of the essay to illustrate how the model was translated into software, but the programs themselves should be placed in the appendix. Each line of code of a program fragment included in the body of the essay should count as two words towards the word limit. The focus of any extended essay that uses a computer to build and exercise models, or to analyse data, must be on the discipline of physics, not the software.

In theoretical or survey essays, and in data-based essays, an evaluation of the quality and reliability of the literature sources used must be part of the essay. For this, candidates must have read enough about the topic to make a value judgement about the reliability of the sources. Candidates should not hesitate to discuss conflicting ideas and present their own opinions with their own arguments.

Analysis must complement data or information, and not simply repeat it, while an interpretation should be deduced logically from the data or information. Unfounded, far-fetched extrapolation should be avoided and shortcomings recognized. The discussion should not be a re-wording of results; it should generate a solid interpretation of the results to be compared to published research on the topic.

Assessment Criteria

J Principles of physics

Achievement level

- | | |
|----------|---|
| 0 | There is no evidence of an understanding or knowledge of the principles of physics relating to the essay. |
| 1 | There is minimal knowledge and understanding of the principles of physics relating to the essay. |
| 2 | There is some knowledge and understanding of the principles of physics relating to the essay. |
| 3 | There is good knowledge and understanding of the principles of physics relating to the essay. |
| 4 | There is an excellent knowledge and understanding of the principles of physics relating to the essay. |

K Use of methods or sources appropriate to physics

Achievement level

- | | |
|----------|--|
| 0 | The methods or sources used are not relevant or not appropriate to physics. |
| 1 | The methods or sources used are appropriate to physics and relevant to the research question, but show minimal competence or are not carefully selected. |
| 2 | The methods or sources used are appropriate to physics and relevant to the research question, and are carefully chosen, but used in a routine manner. |
| 3 | The methods or sources used are appropriate to physics and relevant to the research question, are carefully chosen and competently used, and there is some evidence of a personal approach to this application. |
| 4 | The methods or sources used are appropriate to physics and relevant to the research question, are carefully chosen and competently used, and there is clear evidence of a personal approach to this application. |

L Reasoning surrounding the research and its limitations

Achievement level

- 0** There is no awareness of uncertainties, approximations, quality of experimental design or quality of sources accessed. There are no explanations, confirmations or refutations.
- 1** Uncertainties, approximations, quality of experimental design or quality of sources accessed are briefly mentioned. There is no supporting evidence for explanations, confirmations and refutations.
- 2** There is a clear awareness but no analysis of uncertainties, approximations, quality of experimental design or quality of sources accessed. Explanations, confirmations and refutations are inadequately supported by these considerations.
- 3** There is a clear awareness but limited analysis of uncertainties, approximations, quality of experimental design or quality of sources accessed. Explanations, confirmations and refutations are not wholly supported by these analyses.
- 4** Uncertainties in experimental data are thoroughly analysed and approximations in models are accounted for. Inadequate experimental design or any systematic error is exposed. The quality of sources accessed is verified by secondary sources or by direct calculations. Explanations, confirmations and refutations are supported by this analysis.

POLITICS

Education in Plato's 'Republic' is better than The political thought of Plato.

The concept of 'the dictatorship of the proletariat' in Marxist-Leninism is better than Marxist-Leninism.

US intervention in Grenada: a study of the War Powers Act and the war-making powers of the US president is better than The US president and US foreign policy.

A comparison of the nationalist vote in Wales in the British general elections of 1992 and 1997 is better than The British general election of 1997.

Treatment of the Topic

As the foregoing examples illustrate, topics for extended essays in politics may be drawn from any one of the various areas of the discipline, such as political thought, political institutions or political behaviour. Whatever area is chosen, it should be one of genuine interest to the candidate.

Local studies in the field of politics will be acceptable, such as an investigation into the work of some aspect of local government or interest group, provided that they are approached with sufficient methodological rigour. In such a study, for example, relevant theoretical perspectives on representation should be considered.

Ideas for topics may be stimulated by current events, but essays which simply describe such events will not be successful. Comparative perspectives may offer another useful approach, but a clear focus must be maintained if the topic is not to become unwieldy or overly descriptive.

It is probably helpful to consider the conclusion at the same time as beginning to write the essay. The conclusion must be seen to provide a comprehensive judgement on the enquiry and

Assessment Criteria

J Political context of the topic

Achievement level

- 0** The candidate fails to provide any appropriate contextual information.
- 1** The candidate provides a description of the political context of the topic which is largely inappropriate and/or too lengthy.
- 2** The candidate provides a generally appropriate description of the political context of the topic.
- 3** The candidate provides a very clear and appropriate description of the political context of the topic.

K Knowledge and understanding of political institutions/structures

Achievement level

- 0** The candidate fails to demonstrate knowledge and understanding of the appropriate institutions/structures.
- 1** The candidate demonstrates a very limited knowledge and understanding of the appropriate institutions/structures.
- 2** The candidate demonstrates a satisfactory knowledge and understanding of the appropriate institutions/structures.
- 3** The candidate demonstrates an accurate and comprehensive knowledge and understanding of the appropriate institutions/structures.

L Awareness and understanding of relevant theoretical concepts/perspectives

Achievement level

- 0** The candidate shows no awareness of relevant theoretical concepts/perspectives; opinions are subjective or not substantiated.
- 1** The candidate has little awareness of relevant theoretical concepts/perspectives; opinions are largely subjective or not substantiated.
- 2** The candidate demonstrates a satisfactory grasp of relevant theoretical concepts/perspectives and some ability to provide informed and well-substantiated opinions about them.
- 3** The candidate demonstrates a sound grasp of relevant theoretical concepts/ perspectives and the ability to provide informed and well-substantiated opinions about them.

M Balance between descriptive and analytical material

Achievement level

- 0** The essay is seriously deficient in both descriptive and analytical material.
- 1** The essay contains some descriptive but little or no analytical material.
- 2** The essay contains sound analysis which is not fully supported by descriptive material.
- 3** The essay contains sound analysis which is fully supported by descriptive material.

PSYCHOLOGY

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

Psychology is a specialized discipline with its own technical terms, methods and literature. It studies human experience and behaviour, interest in which is by no means confined to psychologists and students of the subject. It is therefore essential for candidates undertaking an extended essay in psychology to have at least an introductory understanding of this subject and its methodology.

Choice of Topic

In choosing a topic candidates may feel attracted to such issues as deviance, drug-taking, dietary disorders, psychiatric illness and paranormal phenomena. It must be emphasized that topics such as these pose challenging problems to the methods and enquiries of experienced psychologists. Candidates should avoid producing a superficial or personal account of these kinds of issues.

It is important to choose an appropriate research question that is well suited to psychological investigation. A specific focus, with precise aims and outcomes, is required for the psychology extended essay. Psychology, in particular, often attracts considerable interest from candidates who have not had formal training in the formulation of a psychological problem or issue. This can result in essays being imprecise and too ambitious in scope.

Candidates are well advised to conduct research on a smaller, rather limited topic that is easily managed, rather than to attempt an unravelling of a complex social science topic within the prescribed word limit. An interesting psychological topic of reasonable size, challenge and intellectual rigour is to be preferred to tackling a large well-known issue that is difficult to address within the constraints of the extended essay assessment criteria.

The submission of an extended essay based on empirical/experimental work is discouraged. If a candidate does undertake empirical/experimental work it is essential that they have the necessary skills.

Some topics may be unsuitable for investigation because of ethical issues. Experiments likely to inflict pain or discomfort on living organisms, or those which may involve access to, or publication of, confidential medical information must be avoided.

The following examples of titles for psychology extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

The fallibility of memory in eyewitness testimony: a review of evidence and implications **is better than** *Human memory.*

'Identity crisis' in adolescence: empirical evidence and theoretical importance **is better than** *Problems of adolescence.*

Can cognitive development in children be accelerated? **is better than** *The growing child.*

An evaluation of physiological and social accounts of the development of alcoholism **is better than** *Drug abuse.*

Treatment of the Topic

Many psychological topics involve ethical considerations, either with respect to the ways in which problems are studied or in terms of interventions which psychologists seek to make. Wherever appropriate, showing a sensitivity to such ethical issues and a respect for confidentiality is encouraged in extended essays in psychology.

The ideal extended essay will develop a coherent argument examining key concepts with care, reviewing relevant evidence, and considering in some critical detail the methods and procedures which authors have used to produce empirical data or to arrive at theoretical conclusions.

Candidates are encouraged to show an awareness of cultural influences on both the assumptions and content of psychology.

Before undertaking an extended essay in psychology it is essential that the candidate assesses whether sufficient resources are available for the topic chosen. In this respect the guidance of the supervisor is particularly important since few candidates have previously encountered the discipline and many school libraries have yet to build up their psychology collections. Popular magazines are not considered to be adequate sources of information for an extended essay in psychology.

Assessment Criteria

J **Relevance to the discipline of psychology**

Achievement level

- | | |
|----------|---|
| 0 | There is no mention of issues included in the discipline of psychology. |
| 1 | There is some mention of issues included in the discipline of psychology, but they are expressed only at a rudimentary level. |
| 2 | There is adequate mention of issues included in the discipline of psychology but they are incomplete in their development. |
| 3 | Issues included in the discipline of psychology are central to the essay and are well expressed. |

K **Use of technical terms and methods appropriate to the specialized discipline of psychology**

Achievement level

- | | |
|----------|---|
| 0 | There is no use of psychological terms and methods. |
| 1 | Psychological terms and methods are used but are not always appropriate to the research question. |
| 2 | Psychological terms and methods are appropriate to the research question but lack precise application. |
| 3 | There is competent use and understanding of psychological terms and methods appropriate to the research question. |

L Use of psychological resources

Achievement level

- 0** There are no references to psychological resources of a specialist nature.
- 1** There are references to appropriate psychological resources but they are limited in terms of number and/or depth in the context of the research question.
- 2** There are adequate and appropriate references to psychological resources but these are principally secondary materials.
- 3** There is a detailed list of psychological resources including references from scientific journals and magazines.

M Incorporation of theoretical concepts

Achievement level

- 0** The essay makes no contact with theoretical concepts in psychology.
- 1** The essay makes a rudimentary attempt at identifying theoretical concepts relevant to the topic.
- 2** The essay identifies key theoretical concepts of relevance to the topic but lacks evaluation.
- 3** The essay incorporates an evaluative account of key theoretical concepts.

SOCIAL ANTHROPOLOGY

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

An extended essay in social anthropology should enable candidates to develop and demonstrate an awareness of what makes a distinctively anthropological approach to a study of a particular group, society or topic. It is further expected that candidates will learn what is involved in transforming the products of their own research into a coherent anthropological presentation.

Choice of Topic

The topic chosen must allow a distinctively anthropological approach, as identified in the subject assessment criteria.

Extended essays based on fieldwork conducted by the candidate should be encouraged. A theoretical extended essay which analyses a particular theme or issue is also acceptable provided that it offers evidence of the candidate's own analysis and interpretation.

Research questions purporting to examine belief systems but containing value judgements supporting or attacking belief systems should be avoided. Research questions concerning social problems, frequently chosen by candidates, are often found to express value judgements, e.g. an essay asking the question *Abortion: can one make a decision concerning the life of another human being?* From the point of view of anthropology, this is an unanswerable question.

The title of the extended essay should indicate a specific focus and problem/s, with reference, if appropriate, to a particular case study. A candidate's first attempt at framing a research question after having chosen a topic is likely to remain overly broad in scope. For example, an essay entitled *Native American culture*, might describe a wide variety of social and cultural features of native American societies. The essay might propose the thesis that mainstream society could learn something of value from these societies. An essay of 4000 words proposing such a broad topic necessarily remains extremely descriptive and superficial.

The following examples of titles for social anthropology extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

The native American sweat lodge: a symbolic analysis **is better than** *Native American social structures*.

Ethnic diversity in Los Angeles: the economic basis of group identity and difference is better than Ethnic groups in Los Angeles.

Mead versus Freeman: the anthropological issues is better than Anthropological issues.

Contemporary academic views of Asian Americans: problems of representation is better than The views of Asian Americans.

The elderly in American society: changing images and their implications is better than The elderly in American society.

Comparative problems are frequently put forward as research questions, and candidates sometimes fail to realize that research strategies involving two or more societies may call for greater narrowing of the research focus than a study in a single society. For example, an essay comparing Mexican and North American views on death is still too broad a theme for a short paper. With careful focusing of the research question on a few contrasting points, and the identification of underlying patterns for a limited range of described differences, the essay might be more successful, and not almost entirely descriptive.

Treatment of the Topic

Explicit reference should be made to anthropological concepts and theory, and their application to the investigation.

The discussion within the extended essay, whether based on fieldwork or not, should make reference to methodological issues appropriate to the investigation.

Theoretical conclusions should be clearly related to the ethnographic or fieldwork data presented.

Explicit evidence should be given of anthropological reading.

Where fieldwork is undertaken, the candidate should:

- go beyond a superficial description to analyse underlying patterns and causes
- show recognition of the methodological problems involved in the collection, evaluation and presentation of ethnographic data
- show sensitivity to those being questioned and studied
- pay explicit attention to ethical issues.

Particular attention should be paid to the above issues with regard to gender, and to ethnic and class relations between the observer and the observed.

Assessment Criteria

J Evidence of anthropological reading

Achievement level

- 0** There is no evidence of the use of anthropological sources or reading.
- 1** The candidate includes little evidence of anthropological reading, or the references are not explicit and many are either obscure or irrelevant.
- 2** The candidate includes explicit evidence of anthropological reading, although some references may not be strictly relevant.
- 3** The candidate includes clear and explicit evidence of relevant anthropological reading.

K Application of anthropological concepts and theory to the research question

Achievement level

- 0** There is no reference made to either anthropological concepts or theory.
- 1** The candidate shows minimal knowledge of anthropological concepts of general relevance to the research question. No reference is made to anthropological theory.
- 2** The candidate demonstrates some knowledge of anthropological concepts and/or theory of relevance to the research question. This knowledge is applied to the materials and/or issues presented, but a critical perspective is lacking.
- 3** The candidate demonstrates application of anthropological concepts and theory to materials and issues of relevance to the research question, and places them in a critical perspective.

L Methodological issues involved in the collection, evaluation and presentation of ethnographic or fieldwork data**Achievement level**

- 0** There is no reference to methodological issues of any kind.
- 1** There is some attempt to recognize methodological issues in general, but these issues lack relevance to the investigation.
- 2** The candidate recognizes some of the methodological issues involved in the collection, evaluation and presentation of ethnographic or fieldwork data, which are relevant to the investigation.
- 3** The candidate clearly recognizes, and makes explicit reference to, methodological issues related to the collection, evaluation and presentation of ethnographic or fieldwork data in the investigation.

M Recognition of underlying patterns and causes**Achievement level**

- 0** There is no attempt to move beyond description to identify underlying patterns.
- 1** The candidate has tried to move beyond description to identify underlying patterns, but there is no explanation of the link between them.
- 2** The candidate has moved beyond description to identify underlying patterns, but the link between them is poorly explained.
- 3** The candidate clearly demonstrates an ability to move beyond description to recognize underlying patterns and causes, which are effectively linked.

THEATRE ARTS

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

Extended essays in theatre arts provide the opportunity to undertake research into a limited topic which is of particular interest for the candidate. The study should involve imaginative, personal and critical evaluation combined with disciplined and accurate research.

The Nature of the Subject

Of all the arts, the theatre is the one that looks most like life. Characters on stage court and marry, pick quarrels and fight, fall sick and die. In short, they seem to live, albeit in a compressed way. "Theatre", Alfred Hitchcock said, "is life without the boring parts."

The truth of the matter is, of course, that theatre is not life any more than landscape painting is nature. Theatre is an art. Indeed, it is a composite art, which incorporates several arts and several crafts: the actor's art, the playwright's art, the director's art and the designer's art; the carpenter's craft, the scene-painter's craft, the costumier's craft and the electrician's craft. Off-stage, it incorporates an additional spectrum of skills, from the accountant's to the publicity agent's. And it is the degree of skill and cohesion with which these arts, crafts and skills are combined which determines how effective, often how lifelike, a theatrical event will be.

For the truth of the theatre lies in its artifice. To approach an understanding of that truth, candidates must become acquainted with the forms and varieties that artifice has taken throughout history in a diversity of cultures. They must also come to understand the composite nature of the theatre: that, although it incorporates literature, it is not simply literature on its feet and that, though it requires several kinds of physicality, it is not mere athleticism. They must also learn, and learn to respect, the variety of talents and skills the theatre requires, and must understand and respect the extent to which the theatre must be a synthesis of these skills and talents.

Today, in an age of film, candidates should understand that theatre is a different art from film, and they must understand how it is different. And it is essential that, to understand all this properly, they understand it with their voices, bodies and emotions as well as with their minds.

At the same time, they must come to understand that the theatre is also very simple. In its essence, all it requires is an actor, two planks and a passion and, if really necessary, it does not need the two planks. Ultimately, candidates must come to understand that the end and purpose of all theatre, ancient and modern, occidental and oriental, simple and complex, is this: by representation to clarify and illuminate human life, that is, their lives.

Choice of Topic

The first and crucial stage in writing an extended essay is the choice of topic and the framing of a research question. Most extended essays are made or broken at this point, so it is here that a candidate will most need the wise guidance and counsel of the supervisor. The topic needs to ignite at least a spark, or preferably a fire, of enthusiasm in the candidate. It always shows when this is absent. Of course fires can go out and even the dampest wood can catch alight. It is clearly vital that the scope of the topic matches the scale of an extended essay. It needs to be rich enough to offer possibilities of development and discovery but not so wide as to need a book. The judgement and experience of the supervisor can clearly make all the difference here.

Absolute reliance on textbooks is discouraged and no extended essay in theatre arts should be based exclusively on textbooks. They should be consulted in so far as they may stimulate original ideas, provide models of disciplined, structured and informed approaches, and encourage direct and personal involvement with the essay topic.

It needs to be remembered that theatre arts embraces a number of elements which all contribute to the whole truth, which is a performance. It is not necessary to list them. An extended essay may focus on any of these elements; it always seems most fruitful if the specific is seen and presented in the context of the whole process. The most satisfactory essays maintain this balance. For example, one candidate explored the place of design in theatre by both looking at the impact of design on Zeffirelli's production of *Much Ado About Nothing* and also designing her own production of the play by which she laid bare something of the imaginative dialectic between the designer and the director. To some extent, she went on to develop this in relation to the actors, lighting and designer. The least satisfactory essays are generally those which are narrowly literary, divorced from the process of theatre and usually from their historical context as well. The collaborative nature of all performance can hardly be stressed too often.

Comparisons between aspects of two or more different theatrical practices are permissible, but candidates must take great care to ensure that the comparisons are on the one hand genuine, clear and specific, and on the other, a manifestation of sensitive and objective analysis.

After choosing a topic, the candidate should spend some time and great care over framing the research question (or title). A good title should imply the terms of reference of the essay without being so rigid as to stunt its development. Ideally it should be like a seed, the pattern of whose growth is both predictable and surprising. It is at this stage that the connection between the specific and the general can be confirmed. An extended essay should always focus on something quite particular but place it in at least one wider context.

The following examples of titles for theatre arts extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

An investigation into the functions of masks in a selection of Zeami Motokiyo's plays is better than Nō drama.

Contrasting female stereotypes in a selection of Brecht's plays is better than Brecht's aesthetic theories.

An examination of Soyinka's use of rhythm is better than Nigerian theatre.

A study of the effects of the use of fabrics and lighting in 'The Tempest' is better than Shakespeare's problem plays.

Treatment of the Topic

When the research question has been established, it is a good idea for the candidate to make a research plan. Obviously this should not be slavishly followed, and every candidate should allow for some flexibility. The research plan should take account of what is available, or what might become or be made available. The range of materials used will necessarily vary with the topic, but it is important that adequate resources are accessible, though not necessarily too easily accessible. Sometimes the hunt can be most stimulating and can become a part of the essay itself. The bibliography really ought, in most cases, to extend beyond a list of books and journals to include all types of resource materials.

The form of any essay should be the expression of its argument. Implicit in this sentence is that an essay requires an argument. A mere catalogue of information or ideas is not an essay. It is the argument which binds the whole together. Some candidates will not previously have written at such length and may need some guidance about the relation between argument and structure.

The use of materials such as drawings, pictures, plans and photographs should be encouraged where they appropriately illustrate the discussion and/or argument. Any such materials which are drawn from other sources must be acknowledged.

Assessment Criteria

J Personal point of view based on thorough knowledge of the theatrical aspects of the chosen topic

Achievement level

- 0** The candidate demonstrates no satisfactory knowledge or understanding of the theatrical aspects of the topic.
- 1** The candidate demonstrates some knowledge of the theatrical aspects of the topic but does not attempt to express a personal view.
- 2** The candidate demonstrates a satisfactory knowledge of the theatrical aspects of the topic and indicates a personal point of view.
- 3** The candidate demonstrates a satisfactory knowledge of the theatrical aspects of the topic and makes an attempt to illustrate and justify a personal point of view.
- 4** The candidate demonstrates a thorough knowledge of the theatrical aspects of the topic, and illustrates and fully justifies a personal point of view.

K Effect of the research findings on the practice of the theatre form investigated

Achievement level

- 0** The candidate has not considered the effect of the research findings on the practice of the theatre form investigated.
 - 1** The candidate has paid little attention to the effect of the research findings on the practice of the theatre form investigated.
 - 2** The candidate has given adequate consideration to the effect of the research findings on the practice of the theatre form investigated.
 - 3** The candidate has fully considered the effect of the research findings on the practice of the theatre form investigated.
- The candidate has fully considered the effect of the research findings on the practice of the theatre form investigated. Such consider

L Historical/socio-cultural context of the argument/evaluation

Achievement level

- 0** The argument/evaluation is not placed in its historical/socio-cultural context.
- 1** The argument/evaluation is very loosely placed in its historical/socio-cultural context with little attempt at analysis. Very few of the relevant links have been noted.
- 2** The argument/evaluation is loosely placed in its historical/socio-cultural context. The context has been analysed superficially. Some of the relevant links have been noted.
- 3** The argument/evaluation is generally placed in its historical/socio-cultural context. The context has been analysed with some care. Some of the relevant links have been adequately explored.
- 4** The argument/evaluation is directly and clearly placed in its historical/socio-cultural context. The context has been carefully, critically and systematically analysed. Most relevant links have been thoroughly explored.

VISUAL ARTS

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

Extended essays in visual arts offer the opportunity to undertake research into a topic of particular interest for the candidate. The candidate is encouraged to develop and explore in a disciplined and imaginative way a research question appropriate to the subject, and to arrive at a particular, and preferably personal, conclusion.

Choice of Topic

The chosen topic may be generated or inspired by direct experience of art work, craft work or design. This might be related to the student's own culture or another culture. Personal contact with artists and/or designers is strongly encouraged, as is the use of local and/or primary sources.

Absolute reliance on reference books is discouraged. No extended essay in visual arts should be based exclusively on reference books. They should be consulted in so far as they may stimulate original ideas, provide models of disciplined, structured and informed approaches, and encourage direct and personal involvement with the subject of the essay.

It is essential that the topic chosen is clearly and directly related to visual arts. If the connection is only incidental, candidates risk introducing material which is of only marginal relevance, and which will confuse the enquiry and deflect the thrust of the argument.

Topics should not be too broad in scope. Candidates will find it helpful if they express the particular focus of their research in the form of a question which they attempt to address through their investigations and in writing. However, they might not necessarily wish to formulate the title as a question.

The following examples of titles for visual arts extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

An analytical study of the cycle of frescoes of St Christopher's Church in Milan **is better than** *The history of Renaissance art.*

How did Wassily Kandinsky use colour? **is better than** *The Bauhaus.*

An investigation into mask-making in the Sepik River Basin, Papua New Guinea **is better than** *Oriental art.*

An analysis of African influences on Henry Moore is better than Twentieth-century British sculpture.

Criterion B: Approach to the research question

Do candidates need to work from primary sources of art works, or with craft works or design related to material culture? Possible sources are art exhibitions, artefacts, environments and, if the subject of the essay is photography, photographs, magazines, television and films.

What secondary sources do candidates use – photographs, books, catalogues, critical commentaries, journal articles, magazines, films, television?

How do candidates collect and document evidence? What systems do they use?

Criterion C: Analysis/interpretation

What techniques do candidates use to help them analyse, interpret and appraise the ideas and material they have collected?

How do candidates make comparisons with examples of similar work? What criteria do they use for judgement?

What kinds of interpretation are used – historical, psychological, sociological, technical?

Criterion D: Argument/evaluation

Some candidates do not always find it easy to disentangle discussion and argument. Weaker candidates often present a descriptive account, include little discussion and offer no argument. They may amass data indiscriminately, whereas better writers present material in an ordered form, subordinating some elements to bring out significant points and submitting it to rigorous analysis. Good essays are those which have something interesting to communicate, those where there is evidence of original thought and where candidates are able to substantiate their ideas and opinions. The best essays are those where candidates also manage to write in an elegant or convincing manner.

This criterion concerns the way candidates use visual material and examples selectively to illustrate and support the points they make. Are these chosen from a variety of sources?

How do candidates develop an argument through reference to the thinking of others? How do they formulate and express their own views?

Candidates might find it helpful to compare the views of artists and designers with those of critics and others to help them clarify their own thinking. They will find it useful to compare and evaluate contrasting or conflicting views to help structure their argument. They must be able to explain and justify their opinions.

Criterion E: Conclusion

Are candidates able to reflect on the evidence they have selected and presented? What conclusions have they drawn? Is this substantiated by the evidence? Sometimes, conclusions can seem rather perfunctory, and even preconceived, rather than developed from the research.

Assessment Criteria

J **Personal point of view based on thorough knowledge of the visual arts aspects of the chosen topic**

Achievement level

- | | |
|----------|--|
| 0 | The candidate demonstrates no satisfactory knowledge or understanding of the visual arts aspects of the topic. |
| 1 | The candidate demonstrates some knowledge of the visual arts aspects of the topic but does not attempt to express a personal view. |
| 2 | The candidate demonstrates a satisfactory knowledge of the visual arts aspects of the topic and indicates a personal point of view. |
| 3 | The candidate demonstrates a satisfactory knowledge of the visual arts aspects of the topic and makes an attempt to illustrate and justify a personal point of view. |
| 4 | The candidate demonstrates a thorough knowledge of the visual arts aspects of the topic, and illustrates and fully justifies a personal point of view. |

K **Use of appropriate sources**

Achievement level

- | | |
|----------|--|
| 0 | There is no evidence of the use of any appropriate sources. |
| 1 | There is little evidence of the use of appropriate sources and these are ineffectively used. |
| 2 | There is evidence of the use of appropriate sources but these are not always used effectively. |
| 3 | There is evidence of the effective use of a considered selection of appropriate sources. |
| 4 | There is strong evidence of the highly effective use of an original and considered selection of appropriate sources. |

L Historical/socio-cultural context of the argument/evaluation

Achievement level

- 0** The argument/evaluation is not placed in its historical/socio-cultural context.
- 1** The argument/evaluation is very loosely placed in its historical/socio-cultural context with little attempt at analysis. Very few of the relevant links have been noted.
- 2** The argument/evaluation is loosely placed in its historical/socio-cultural context. The context has been analysed superficially. Some of the relevant links have been noted.
- 3** The argument/evaluation is generally placed in its historical/socio-cultural context. The context has been analysed with some care. Some of the relevant links have been adequately explored.
- 4** The argument/evaluation is directly and clearly placed in its historical/socio-cultural context. The context has been carefully, critically and systematically analysed. Most relevant links have been thoroughly explored.

WORLD RELIGIONS

These subject guidelines should be read in conjunction with the IB extended essay general guidelines.

Introduction

Extended essays in world religions provide candidates with the opportunity to undertake an in-depth investigation into a limited topic within the field of world religions. The study should involve imaginative, personal and critical evaluation combined with disciplined and accurate research.

Candidates who are considering registering an extended essay in this subject, which is a school-based syllabus, are strongly advised to study carefully a copy of the syllabus, obtainable from IBCA, before making a final decision. The syllabus gives a clear idea of the scope and content of the subject and will help candidates to decide whether their choice of topic is appropriate.

World religions comprises a systematic, critical, yet sensitive study of the variety of beliefs, values and practices encountered in religions globally. It adopts a phenomenological approach in which a rigorous attempt is made to maintain objectivity in the analysis and evaluation of religions. In essence, this involves examining and explaining the beliefs, values and practices of a religion by using the language and concepts from within that religious tradition. Any kind of reductionist approach that tries to explain religious phenomena by reducing them to the language and practices of either another religion, or the secular framework of psychology, sociology or history, for example, should be avoided. However, those reductionist approaches may themselves be a topic for study.

World religions aims to promote an inquiring, critical and sympathetic approach to the study of religions; to enable students to acquire a substantial knowledge of the beliefs, values and practices of a number of religions; to provide students with an appreciation and understanding of the issues surrounding those beliefs, values, practices and movements in the world today; to provide an understanding of how religions affect people's lives, and to develop an awareness of the significance for the adherents of each of the faiths studied. In other words, the concern is not just with what the followers of a faith believe and do, but also with an understanding of why they do so, through an appreciation of the form of life and world outlook which they constitute.

Choice of Topic

Topics may be drawn from any area of world religions. Any of the world's religions, present or past, are acceptable, provided the issues discussed fall within the field of world religions.

Topics must be appropriate to the subject. Interdisciplinary topics should, therefore, be avoided. It should be made clear to candidates who have not followed a course in world religions, and who are, therefore, unfamiliar with the discipline and its methodology, that an essay in world religions is not an opportunity to write an account of a confessional, evangelizing, apologetic or purely descriptive nature.

Candidates should always be aware of the need for rigorous objectivity when dealing with the truth claims of beliefs (or religions). Supervisors should take particular care to ensure candidates' attention is drawn to the specific requirements of the subject assessment criteria.

The following examples of titles for world religions extended essays are intended as guidance only. The pairings illustrate that focused topics (indicated by the first title) should be encouraged rather than broad topics (indicated by the second title).

The role of creation myths in Maori religion is better than Mythology or Creation myths.

Sufism: an alternative vision for Islam in contemporary Britain is better than Mysticism in Islam.

Is the Mormon church Christian? An examination of Mormon baptism is better than Mormonism.

The changing face of Buddhist worship: an exploration of worship in contemporary western orders is better than Buddhist worship.

Treatment of the Topic

World religions is not concerned with testing the truth of religious beliefs, though it does embrace discussion as to what types of truth are contained in those beliefs. Nevertheless, it must include critical evaluations of, and frequent reflections on, the meanings of religious beliefs in terms of their impact on the lives, outlook and behaviour of the community of believers. So, for example, questions such as *Was Mohammed the messenger of God?*, or *Did Jesus bar Joseph rise from the dead?* are inappropriate. This does not exclude valid studies such as *The concepts of prophethood and messenger in Sunni (or Shi'a) Islam*, or *Magic and miracles: an examination of contemporary attitudes to miracles in the Catholic church*.

Comparisons between aspects of two or more different religions are permissible, but candidates must take great care to ensure that the comparisons are on the one hand genuine, clear and specific, and on the other, a manifestation of sensitive and objective analysis. Should the candidate or the supervisor have any doubts about the candidate's ability to meet these criteria, then a comparative study should be avoided. Comparison in religious studies means the comparing of ideas or practices, not the making of value judgements such as 'Buddhist meditation is more effective than Christian prayer'.

It is essential that candidates demonstrate a clear, sensitive understanding. The wider implications of, and connections between, issues should be identified and explored.

The use of materials such as drawings, pictures and photographs should be encouraged where they appropriately illustrate the discussion/argument. When such materials are derived from another source, that source must be acknowledged.

Assessment Criteria

J **Balance between descriptive/narrative material and analytical material**

Achievement level

- 0** Analysis of the descriptive/narrative material is entirely absent.
- 1** There is a barely adequate analysis of the descriptive/narrative material.
- 2** A fairly thorough analysis of the descriptive/narrative material has been attempted.
- 3** There is a thorough and extensive analysis of the descriptive/narrative material.

K **Objective treatment of the world religions topic**

Achievement level

- 0** Objectivity in the treatment of the topic is entirely absent.
- 1** There are infrequent signs of objectivity in the treatment of the topic.
- 2** An adequate degree of objectivity has been achieved in the treatment of the topic.
- 3** A very high degree of objectivity has been achieved in the treatment of the topic.

L Awareness and understanding of the world religions topic

Achievement level

- 0** Awareness and understanding of the topic are entirely absent.
- 1** There are infrequent signs of awareness and understanding of the topic.
- 2** Awareness and understanding of the topic are adequate.
- 3** There is a thorough and extensive awareness and understanding of the topic.

M Sensitivity in the treatment of the world religions topic

Achievement level

- 0** Sensitivity in the treatment of the topic is entirely absent.
- 1** There are infrequent signs of sensitivity in the treatment of the topic.
- 2** There is adequate sensitivity in the treatment of the topic.
- 3** There is a very high degree of sensitivity in the treatment of the topic.