



Extended Essay Booklet

Teacher & Student's Guide

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Student Batch: Graduation 2018

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What is the EE?

The EE Basics

- As a Diploma candidate, you must write an Extended Essay (EE).
- The essay is maximum of **4,000 words**.
- You have a supervisor who is a teacher in school (preferably a teacher in DP Course)
- You select the group, subject and topic which you write on.
- Group 1 and 2 language essays must be written in that language (Cannot write an Extended Essay in an ab initio subject).
- All other EE must be written in English (the language that you study with).
- You should write your EE in an IB Subject which is likely to be relevant to the subject you apply to study at University (not mandatory).
- Once you have finished you will have a short interview, or vive voce, with your supervisor and the IB Coordinator.
- The EE is marked by an external examiner, usually an IB teacher from another school/country.
- Expected time spent on EE: **40 hours**

Malpractice is an attempt to gain an unfair advantage (by collusion or plagiarism) and, if found, may result in you not gaining an IB Diploma. When in doubt, Cite!

EE Procedure and Timeline:

1. **August 2016:** You will be introduced to the EE course (1 lesson per week). Make sure you pay as much attention as possible, during the process of writing the EE itself, you will be independent!
2. **October 2016:** You will decide with your teachers and EE coordinator on the choice of subject in which you will write an EE. Consider the “topic area” you intend to write on.
3. **November 2016:** Feasibility study completed on 3 topics in your subject area. **Important Note:** Your supervisors will NOT chase you; make sure you contact them to arrange meetings!
4. **March 2017:** You should by now have agreed upon the precise research question, and you will sign a contract with your EE Supervisor.
5. **April 2017:** Annotated Bibliography
6. **August 2017:** Extended Essay first draft due
7. **December 2017:** EE Supervisor will submit the student’s EE to the IB Coordinator. EE viva voce will be conducted.

**The Diploma Points Matrix
(May 2015 onwards)**

| | | Theory of Knowledge | | | | | |
|-----------------------|---------------------------|----------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|
| | | Grade A | Grade B | Grade C | Grade D | Grade E | No Grade N |
| Extended Essay | Grade A | 3 | 3 | 2 | 2 | Failing Condition | Failing Condition |
| | Grade B | 3 | 2 | 2 | 1 | Failing Condition | Failing Condition |
| | Grade C | 2 | 2 | 1 | 0 | Failing Condition | Failing Condition |
| | Grade D | 2 | 1 | 0 | 0 | Failing Condition | Failing Condition |
| | Grade E | Failing Condition | Failing Condition | Failing Condition | Failing Condition | Failing Condition | Failing Condition |
| | No Grade N | Failing Condition | Failing Condition | Failing Condition | Failing Condition | Failing Condition | Failing Condition |

Extended Essay Grade Descriptors

Effective May 2018

Grade A

Demonstrates effective research skills resulting in a well-focused and appropriate research question that can be explored within the scope of the chosen topic; effective engagement with relevant research areas, methods and sources; excellent knowledge and understanding of the topic in the wider context of the relevant discipline; the effective application of source material and correct use of subject-specific terminology and/or concepts further supporting this; consistent and relevant conclusions that are proficiently analyzed; sustained reasoned argumentation supported effectively by evidence; critically evaluated research; excellent presentation of the essay, whereby coherence and consistency further supports the reading of the essay; and present and correctly applied structural and layout elements.

Engagement with the process is conceptual and personal, key decision-making during the research process is documented, and personal reflections are evidenced, including those that are forward-thinking.

Grade B

Demonstrates appropriate research skills resulting in a research question that can be explored within the scope of the chosen topic; reasonably effective engagement with relevant research areas, methods and sources; good knowledge and understanding of the topic in the wider context of the relevant discipline; a reasonably effective application of source material and use of subject-specific terminology and/or concepts; consistent conclusions that are accurately analyzed; reasoned argumentation often supported by evidence; research that at times evidences critical evaluation; and a clear presentation of all structural and layout elements, which further supports the reading of the essay.

Engagement with the process is generally evidenced by the reflections and key decision-making during the research process is documented.

Grade C

Demonstrates evidence of research undertaken, which has led to a research question that is not necessarily expressed in a way that can be explored within the scope of the chosen topic; partially effective engagement with mostly appropriate research areas, methods and sources— however, there are some discrepancies in those processes, although these do not interfere with the planning and approach; some knowledge and understanding of the topic in the wider context of the discipline, which is mostly relevant; the attempted application of source material and appropriate terminology and/or concepts; an attempted synthesis of research results with partially relevant analysis; conclusions partly supported by the evidence; discussion that is descriptive rather than analytical; attempted evaluation; satisfactory presentation of the essay, with weaknesses that do not hinder the reading of the essay; and some structural and layout elements that are missing or are incorrectly applied.

Engagement with the process is evidenced but shows mostly factual information, with personal reflection mostly limited to procedural issues.

Grade D

Demonstrates a lack of research, resulting in unsatisfactory focus and a research question that is not answerable within the scope of the chosen topic; at times engagement with appropriate research, methods and sources, but discrepancies in those processes that occasionally interfere with the planning and approach; some relevant knowledge and understanding of the topic in the wider context of the discipline, which are at times irrelevant; the attempted application of source material, but with inaccuracies in the use of, or underuse of, terminology and/or concepts; irrelevant analysis and inconsistent conclusions as a result of a descriptive discussion; a lack of evaluation; presentation of the essay that at times is illogical and hinders the reading; and structural and layout elements that are missing.

Engagement with the process is evidenced but is superficial, with personal reflections that are solely narrative and concerned with procedural elements.

Grade E

Demonstrates an unclear nature of the essay; a generally unsystematic approach and resulting unfocused research question; limited engagement with limited research and sources; generally limited and only partially accurate knowledge and understanding of the topic in the wider context of the relevant discipline; ineffective connections in the application of source material and inaccuracies in the terminology and/or concepts used; a summarizing of results of research with inconsistent analysis; an attempted outline of an argument, but one that is generally descriptive in nature; and a layout that generally lacks or incorrectly applies several layout and structural elements.

Engagement with the process is limited, with limited factual or decision-making information and no personal reflection on the process.

Assessment Criteria

The assessment criteria are there for the students to check their work submitted must address these criteria effectively.

| Criteria | | Marks Available |
|----------------------------------|---|-----------------|
| A | Focus and Method | 6 |
| | <ul style="list-style-type: none"> ➤ Topic ➤ Research Question ➤ Methodology | |
| B | Knowledge and Understanding | 6 |
| | <ul style="list-style-type: none"> ➤ Context ➤ Subject-specific terminology and concepts | |
| C | Critical Thinking | 12 |
| | <ul style="list-style-type: none"> ➤ Research ➤ Analysis ➤ Discussion and Evaluation | |
| D | Presentation | 4 |
| | <ul style="list-style-type: none"> ➤ Structure ➤ Layout | |
| E | Engagement | 6 |
| | <ul style="list-style-type: none"> ➤ Process ➤ Research Focus | |
| Total marks available: 34 | | |

The purpose of these criteria is to consider:

- **A: Focus and Method:** This criterion focuses on the topic, the research question and the methodology. It assesses the explanation of the focus of the research (this includes the topic and the research question), how the research will be undertaken, and how the focus is maintained throughout the essay (this includes methodology)
- **B: Knowledge and Understanding:** This criterion assesses the extent to which the research relates to the subject area / discipline used to explore the research question, or in the case of the world studies extended essay, the issue addressed and the two disciplinary perspectives applied, and additionally the way in which this knowledge and understanding is demonstrated through the use of appropriate terminology and connects.
- **C: Critical Thinking:** This criterion assesses the extent to which critical-thinking skills have been used to analyze and evaluate the research undertaken.

- **D: Presentation:** This criterion assesses the extent to which the presentation follows standard format expected for academic writing and the extent to which this aids effective communication.
- **E: Engagement:** This criterion assesses the student's engagement with their research focus and the research process. It will be applied by the examiner at the end of the assessment of the essay, after considering the student's Reflections on planning and progress form.

How should the assessment criteria influence my research?

It is intended to help you understand each criterion in terms of what should be included in the extended essay to achieve the highest level.

A: Focus and Method:

1. The topic chosen is identified and explained to readers in terms of contextualizing and justifying its worthiness.
 - How well does the research paper identify and communicate the chosen topic?
2. The purpose and focus of the research to be addressed is within the scope of a 4,000 word extended essay, is outlined in the introduction and specified as a research question
 - Is the research question appropriate given the scope of the task? For example, is the topic sufficiently focused to be adequately addressed within the requirements of the task?
 - Is the research question clearly stated, focused and based on/situated against background knowledge and understanding of the chosen subject/topic area?
 - Is the focus of the research question maintained throughout the essay?
3. The research is planned and appropriate methods of data collection (methodology) are chosen and identified in order to address the research question.
 - Is there evidence of effective and informed source/method selection with regard to the choice of appropriate sources and/or method(s) used to gather information, including narrowing of scope the range of sources/methods, in order to address the research question within the constraints of the word limit?
4. Sources/methods are considered relevant/appropriate or sufficient in so far as the academic standards for the discipline are concerned. For example, for an economics essay, it would not be sufficient to only use textbooks but rather include reports and data. There is no consideration of the research question as such.

B: Knowledge and Understanding:

1. The research question being investigated is put into the context of the subject / discipline / issue.
 - Demonstration of the appropriate and relevant selection and application of the sources is identified.
2. Knowledge and understanding of the topic chosen and the research question posed is demonstrated with appropriate subject-specific terminology.
 - The use of subject-specific terminology and/or concepts is an indicator of knowledge and understanding of the discipline(s) / issue discussed.
3. Sources / methods are assessed here in terms of their appropriateness to the research question.

C: Critical Thinking:

The selection application of the research presented is relevant and appropriate to the research question.

1. The appropriateness of sources / methods in terms of how they have been used in the development of the argument presented.
2. The analysis of the research is effective and focused on the research question.
3. The discussion of the research develops a clear and coherent reasoned argument in relation to the research question.
4. There is a critical evaluation of the arguments presented in the essay.
5. Unlikely or unexpected outcomes can also demonstrate critical thinking.

D: Presentation:

1. **Structure:** the structure of the essay is compatible with the expected conventions of a research paper in the subject for which the essay has been submitted. (Examiners, supervisors and students are advised to check guidance given in the Extended Essay guide for the relevant subject.)
2. **Layout:** title page, table of contents, page numbers, section headings (where appropriate), effective inclusion of illustrative materials (tables, graphs, illustrations, appropriately labeled) and quotations, bibliography and referencing.

The referencing system should be correctly and consistently applied and should contain the minimum information as detailed in the Extended Essay guide. If referencing does not meet this minimum standard work should be considered as a case of possible academic misconduct.

The extended essay has not exceeded the maximum word limit. If the essay exceeds 4,000-words, examiners should not read or assess beyond the maximum 4,000-word limit. Students who exceed the word limit will compromise the assessment of their extended essay across all criteria.

E: Engagement:

1. **Engagement with the process:** the student has engaged in discussions with their supervisor in the planning and progress of their research; the student is able to reflect on and refine the research process, and react to insights gained through the exploration of their research question; the student is able to evaluate decisions made throughout the research process and suggest improvements for their own working practices.
2. **Engagement with their research focus:** an insight into the student's thinking, intellectual initiative and creative approach through reflections on the thought and research process; the extent to which the student voice is present rather than that of the supervisor and academics; the extent to which the student voice is present rather than that of the supervisor and academics; is the student's engagement reflected?

How is my Extended Essay marked?

- All EEs are sent marking to IB examiners who are specialists in the subject. Your EE may be marked by an examiner who is anywhere in the world.
- The EE is not returned to you and, on submission becomes the intellectual property of the IBO – i.e you assign copyright to the IBO of anything that you submit unless you fill in a form requesting that you retain copyright.
- The examiner will use the same assessment criteria which you have been using throughout the research and writing process.
- You can achieve a reasonable score by just following the simple rules. If you:
 - State your research question
 - Analyze your results
 - Discuss your results
 - Have a conclusion
 - Keep to about 4000 words
 - Cite all sources appropriatelyThen you achieve marks even before we look at the content and subject-specific criteria. The general criteria will get you the most marks.
- The maximum mark for an EE is 34. The marks are put into grades A-E.
- Your TOK essay and presentation are also marked and the grade bands you achieve are put into the Diploma Points' Matrix to see if you get any bonus points. **Failure to submit a TOK essay and do a presentation or submit an EE means you get N which is no award of Diploma. Two elementary grades also give a failing condition.**

General Hints Concerning your EE

1. **It is only worth a maximum of 1.5 points out of 45.** Keep it in perspective with your other subjects.
2. Keep your EE under control – it should take no more than 40 hours altogether from the time you first think about it until you hand in your final draft.
3. Keep your topic and research question manageable within the time you have and your skills. A simpler research question is always better, e.g. “To what extent might internal fighting explain the collapse of the Mayan civilization” is better than “The Mayan civilization”; “Is it better to use dried animal dung as fertilizer or a fuel?” is better than “Combustion and nitrogen analysis”.
4. 4,000 words is the maximum you are allowed. That is about 10 A4 pages.
5. It should be on a topic that interests you and that you want to find out about.
6. You are unlikely to change the world with the content of your EE. You are not expected to write something totally original, just new to you.
7. Do not think you can just take an essay you have already written, add some extra words and hand that in. Doing this will at best get you very low marks. The EE has very different assessment criteria from what your IB teachers are usually looking for. In this sense the EE is not really an extended essay, it is a piece of personal research in a specific structure and format.
8. Follow the guidelines for general and subject specific criteria. You may write a great EE but get low marks because you fail to follow the instructions.
9. Above all, **keep to the deadlines.** They are there to help you manage your time. Failure to do so will be your loss, will put pressure on future, more important work and result in you getting a hard time from your supervisor and IB Coordinator.
10. Your EE will never really be a finished product. There will simply come a time when you must hand it in.

The EE Supervisor

Key points about your supervisor

- It is important to maintain a good working relationship with your supervisor. Your supervisor is not under any obligation to take on this role. It is additional to all their other work. Do not abuse the privilege.
- Do not expect your supervisor to chase after you, remind you of deadlines or do any of the work for you.
- Try to follow your supervisor's advice about research, writing and presentation. To ignore their advice is to throw marks away.
- The success of your EE depends about 75% on your input, roughly, and 25% on your Supervisor's. They are important, but only if you work hard with them.

What does my supervisor do?

- Gives you advice, guidance and support in selecting a topic and undertaking research and, in particular, help you formulate a well-focused research question.
- Ensures that the chosen research question meets the requirements of the IBO and satisfies appropriate legal and ethical standards.
- Spends about 2-3 hours supervising you, most of which is at the beginning.
- Ensures the Extended Essay is your own work by monitoring your progress and seeing drafts.
- Read and comment on the first draft only of the EE (**but not edit the draft**).
- Read the final version of your essay to confirm its authenticity; completes a supervisor's report on your EE and signs it if he/she thinks this is your own work.
- Submits a predicted grade for your EE to IBO.

What does my supervisor not do?

- Your supervisor does not decide the topic nor research question for you.
- Your supervisor cannot edit your draft essay but he/she may read and comment on it. They can't provide you either with resources.
- Your supervisor will NOT remind of deadlines to meet.

Who else can help me?

Academic research is never an entirely solitary pursuit. The best research uses, and acknowledges other people, experts and professionals.

- You can speak to the IB Coordinator, to other teachers, check IB websites and forums.
- Try contacting a couple of University Professors and Tutors. Find out which ones have written about this general subject area. Get a hold of their email contacts (usually on University websites). Ask their advice and thoughts. The worst they can do is not reply. If you are polite and show enthusiasm, they might end you a reply. There have been occasions when a fruitful email correspondence has been developed.
- Use not just libraries but also librarians: school, city, national and university.

Summary of Roles and Responsibilities

| Student | EE Supervisor | EE Coordinator |
|--|---|---|
| Arrange and keep appointments with supervisor. | Be available for consultation. | Be available for consultation. |
| Perpare for meetings and bring relevant material | Prepare for meetings and bring relevant material. | Prepare for meetings and bring relevant material. |
| Ask for guidance and infrom supervisor and EE coordinator, if any difficulties arise. | Offer guidance in relation to subject critiera and shaping the research question, indicate key authors / material and offer advice on structuring the essay. | Offer guidance in relation to the formal requirements of the essay to both supervisor and student; provide subject criteria and exemplar essays where available. |
| Pace yourself so that work is ongoing between meetings and you are not overburdened when other deadlines occur | Suggest strategies to help if difficulties arise. | Suggest strategies to help students if difficulties arise. |
| Be honest with the supervisor about your progress; communicate regularly and show your supervisor your notes at regular intervals. | Monitor the student's work so that if can be affirmed that it is their own work. Conduct a viva voce final interview and sign the declaration on the essay cover sheet. | Ensure students are aware of the expectation that this will consitute 40 hours work and that a poor essay or plagiarism may result in failure to achieve the diploma. |
| Anticipate any practical needs and liaise with supervisor (for lab time, planning fieldwork, visiting museums etc.) | Arrange lab time if needed, help with planning fieldwork or research trips. | Arrange a session on research techniques and visit to a research library. |
| Meet all deadlines for interviews and submission of written work. | Read written submissions and return promptly with advice. <i>NB: Supervisor is not allowed to edit or correct written material.</i> | Ensure adherence to deadlines; take action if a student is falling behind schedule. |

Choosing a Subject, Topic and Research Question

EE Subjects to choose from

{Check corresponding page number in the IB Extended Essay Guide Published February 2016}

- Group 1 Language A
 - p. 116 Language and Literature
- Group 2
 - p. 128 Language B
- Group 3
 - p. 146 Business management
 - p. 167 Geography
 - p. 184 History
- Group 4
 - p. 240 Biology
 - p. 250 Chemistry
 - p. 276 Physics
- Group 5
 - p. 295 Mathematics

To choose a subject, ask yourself

1. What subjects am I studying at HL (not mandatory but could help you)
2. What subjects do I most enjoy studying?
3. What subjects do I want to study at University?
4. What subjects do I want to talk about in my University interview?

Once you have answered these questions, choose your subject.

Subject Choice Lotto

1. If more than 3 students pick the same subject as their first choice a lotto (drawing of names) will occur.*
2. If a student doesn't get their first choice due to lotto they will then have their second choice put down.
3. If a student's second choice is in a group of more than 3 then lotto will occur again.
4. If a student again doesn't get their second choice then their third choice will be put down and they will be locked in no more lotto for that student.

*Depending on circumstances (Universities and so on) automatic approval will be given or the supervisor could have 4 students. No more than 4 students are allowed.

Once you have chosen the subject, choose three topics within that subject by asking yourself

1. What topics have I enjoyed learning about?
2. What topics do I find interesting or prompt my enthusiasm?
3. What interests do I have?

Once you have answered these questions, choose your topics and start your feasibility study.

What do I do if I have no idea for a subject or topic for my EE?

1. Talk to your EE Coordinator and your IB DP Coordinator.
2. Ask any of your teachers if you could have 5 minutes to speak to them about possible research questions. They may not end up being your supervisor, but they may be able to help you at this point.
3. Read through this booklet.
4. Read through some past EE
5. If you have lots of ideas, do not get wrapped up trying to work out what would be the best topic for you. Choose a topic that is good enough.

It is up to you to make appointments with teachers and the IB DP Coordinator to discuss the EE. They will not chase you.

Points to bear in mind in choosing a subject and topic

| | |
|---------|---|
| Group 1 | <ul style="list-style-type: none"> ➤ Your understanding must be shown in the form of: <ul style="list-style-type: none"> ○ an analysis of a cultural context or a specific text. ○ an analysis of trends in the culture studied and the impact of a cultural change on the form or use of the Language. ○ an analysis and comparison of literary texts ➤ You can write on a book you are studying in class but you must go beyond that book and show evidence of wider reading. |
| Group 2 | <ul style="list-style-type: none"> ➤ You must write it in that target language. |
| Group 3 | <ul style="list-style-type: none"> ➤ Avoid “What if..?” questions. ➤ An analysis of reliability and/or representativeness of sources will be crucial. ➤ Avoid purely biographical or historical research questions. ➤ Students should avoid straightforward “What” and “How” questions as they tend to lead to narrative treatment. Terms such as “How significant....?” “Or how successful....?” Are more likely to engage students in analysis. ➤ The question should encourage an investigation that lends itself to analysis and critical commentary. |
| Group 4 | <p>Decide if you want to do an experimental or library-based EE.</p> <ul style="list-style-type: none"> ➤ Experimental EEs: these tend to score better than the library-based EEs in Group 4. It is fairly easy to get data and then analyze it. You have to work with the Science teachers in order to find time when you can use the laboratory to collect data while being supervised by a member of staff. Avoid experiments for which the outcome is already well documented. ➤ Library-based EEs: A questionnaire, survey or library-based topic in Group 4 may be easier to research (in school or at a University library) but you need to manage a large amount of material and be selective for relevant information. |

Points to bear in mind in choosing a subject and topic

| | |
|---------|--|
| Group 5 | <ul style="list-style-type: none">➤ Unless you are taking Maths HL, avoid EE in Group 5.➤ Essays in this group are divided into six categories:<ul style="list-style-type: none">○ The applicability of mathematics to solve both real and abstract problems.○ The beauty of mathematics – eg geometry or fractal theory.○ The history of mathematics: the origin and subsequent development of a branch of mathematics over a period of time, measured in tens, hundreds or thousands of years.○ The effect of technology on mathematics:<ul style="list-style-type: none">▪ In forging links between different branches of mathematics.▪ Or in bringing about a new branch of mathematics or causing a particular branch to flourish. |
|---------|--|

Once you have thought through these points, choose a research question.

- To come up with a research question, follow the above guidelines, and discuss with your supervisory and EE coordinator.
- The question must be an open question (i.e. it cannot be answered by a simple yes or no)
- The question must limit your research to something which is manageable within 4,000 words and 40 hours. **The question must be very specific.**
- Choose a topic and research question about which there is barely any research already and which is unique. This will allow you to show more personal judgment, and hence score more highly. If a website search engine turns up a lot of information about the topic, it is best to avoid it.
- Do not attempt topics which are taught in relatively good depth in the syllabus. Choose topics and questions for which you think you will find almost no pre-existing information.
- It does not matter if the topic is not an area your supervisor knows much about, s/he will still understand the subject, the approach to take and the pitfalls to avoid.

Choosing a Subject, Topic and Research Question

| Subject | Good Questions | Poor Questions |
|-----------|--|--|
| English A | How are men and women portrayed differently in Elizabeth Gaskell's 'North and South'? | How are men and women portrayed by Elizabeth Gaskell in her novels? (<i>too large</i>) |
| | How do Shakespeare and Sophocles differ in the way they present madness in Lear and Ajax? | Madness in Shakespeare and Sophocles (<i>not a question</i>) |
| | How do Shakespeare and Sophocles differ in the way they present madness in Lear and Ajax? | How did Thomas Hardy's life influence his poetry? (<i>too biographical</i>) |
| Geography | To what extent can changes in temperatures in England across the 20th century be explained by solar energy output? | How do temperatures in England change over a year? (<i>just an extended piece of field work</i>) |
| | How has tourism in Sri Lanka shifted since the tsunami of 2004? | How have Nike changed their marketing in response to environmental concerns? (<i>not geographical, more Business and Management</i>) |
| History | Which theory best explains why Labor won a landslide in 1997? | Why did Barak Obama win the Presidential election of 2008? (<i>too recent, must be at least 10 years in the past</i>) |
| | To what extent were Hitler's educational aims fulfilled in the Uhland Gymnasium, 1937-1939? | How successful were the Nazis in maintaining control? (<i>too broad</i>) |
| Biology | What effect does detergent toxicity have on soil bacteria? | How are detergents broken down in the soil? (<i>has a partly Chemistry focus, not focused solely on Biology</i>) |
| | What effect does differing pH levels on the growth of <i>Phaseolus vulgaris</i> ? | The effect of acidity on plant growth. (<i>not a question</i>) |
| Physics | To what extent is it possible to determine the presence of a black hole at the center of the Milky Way? | What have been the latest findings about string theory? (<i>too descriptive</i>) |
| | What is the range variation of water flowing out of a hole in a container? | An application of Bernoulli's principle to holes in containers. (<i>not a question, lacks focus</i>) |

Choosing a Subject, Topic and Research Question

| Subject | Good Questions | Poor Questions |
|-----------|--|--|
| Chemistry | What effects do sugar-free chewing gums have on the pH of saliva in the mouth after a meal? | How do alkali metals react with water? (already covered by the syllabus) |
| | What is the relationship between the concentration of aqueous sodium chloride solution and the ratio of the amounts of oxygen and chlorine gas that are evolved at the positive electrode during electrolysis? | Is there a relationship between the concentration of aqueous sodium chloride solution and the ratio of the amounts of oxygen and chlorine gas that are evolved at the positive electrode during electrolysis?" (a closed question) |
| Math | How does the exponential function, and its calculus, inform areas of science such as nuclear physics, geology, anthropology or demography? | The exponential function and its calculus. (not a question, lacks focus) |
| | How well can π , e , and other irrationals be approximated by rational numbers? | To what extent have rivalries between mathematicians helped solve mathematical problems? (too biographical and historical) |

Proper Management of Time

When do I do my research?

- Once your research question has been agreed, then start researching.
- Use weekends and holidays.
- Use School and University libraries. Use not just library but also librarians: school, city, national, university.
- There are several search engine designed specifically for research papers that you might need to consult (EBSCO, JSTOR, SSRN and Proquest to name a few).
- As good as Wikipedia, Bized, Dictionary.com are, they will not make you stand out amongst the crowd and, more importantly, they will not help you score highly as they do not lead to sufficiently personal judgments.
- If you are doing an experimentally based Group 4 EE, then you need to start speaking to the Laboratory Technicians and your Supervisor as soon as possible, about when you can do the lab work.
- The IBO expect your EE to be the result of at least 40 hours of work on your part. This includes time for the writing and re-writing. As with all large tasks, break it down into smaller chunks and take each one at a time.

How do I keep a record of the research I have done?

- From the start keep a record of the books, magazines and journals you have consulted, including the page numbers.
- You can either keep a separate list or keep a record at the top of each page of notes you write of the book, author, publisher, place and date of publication, page number.
- Keep track of the web pages through your favorites or through online research tools (e.g. zotero, co-traker, surfulater etc.).
- Ask your supervisor's advice for techniques and strategies which may work best in your particular discipline.

How do I get my research done on top of all my other work?

- If you do not spend an average of 2 hours a week, you will make it more difficult for yourself, not easier, because if there is a week where you are unable to spend 2 hours, then the next week you will have to increase the amount of time you spend on it.
- As you will need to keep up to date with your other academic responsibilities, it is wiser to do regular small amounts, rather than irregular large amounts.



The secret to juggling your work?

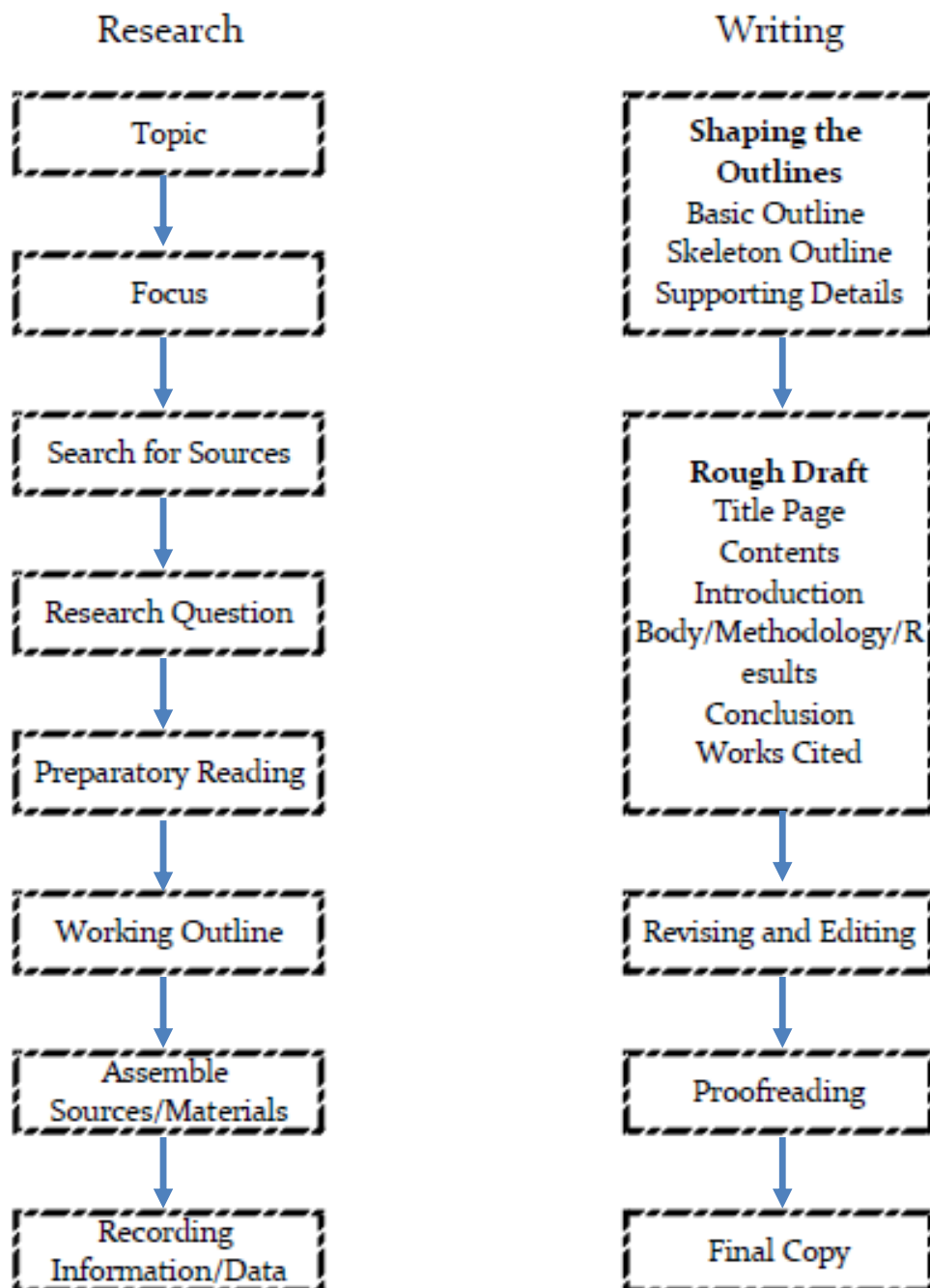
- * Lists
- * Do something for each subject every other day
- * Lists
- * Conscious effort
- * Lists

Researching and Writing your EE

What is the point of my research?

- Engage in independent research with intellectual initiative and rigor
- Develop research, thinking, self-management and communication skills
- Reflect on what has been learned throughout the research and writing process. It is your time to challenge yourself, and truly prepare yourself for what college life feels like! It is a step up from any paper you have ever written in school!

The Research and Writing Process



What is the point of organization?

- To present a structured, well-reasoned, well-developed, well-supported argument.
- To allow others to follow your process and check the primary and secondary data.
- To produce something you can be proud of.
- To further develop and reflect on your skills as an academic.

What drafts can I hand in to be looked at?

- Your supervisor can only comment on one draft, so make sure this is a full draft and that, before you hand it in, that you have checked it through against the assessment criteria. It is a waste of your supervisor's expertise to have them pick up on obvious problems, which you could have identified yourself.
- You can speak to your supervisor about what you are writing and show them the structure to get their advice.

Finishing the Writing

Finishing the Writing How do I make sure I don't miss the deadline?

- The final deadline is when you have to hand in your finished version of your Extended Essay.
- Aim to finish two weeks before this deadline. Then leave your Essay for a couple of days and come back to re-read it and check it against the assessment criteria.
- The way to ensure you do not miss a deadline is to plan to put down in your diary to do some work each week and/or each day leading up to the deadline.
- Add the Extended Essay to your daily list of things to do and avoid having it pushed off that list by other work.
- The aim of the Extended Essay is to develop your personal skills in checking and proofreading your work. Your Supervisor will "read and comment on the first draft only of the extended essay (but does not edit the draft)" and return it to you with brief comments on how you can improve it.

How do I acknowledge my sources?

- Proper acknowledge of your sources is critical to a number of the assessment criteria, not to mention is the key to academic honesty!
- It is also an integral part of the approach the IB is looking to encourage, where you show the basis for your claims and reasoning (as in ToK) and give due consideration and respect to the work of others (as in IB Learner Profile).
- Your sources have to be acknowledged in "an approved academic manner", not in just any old way. It may seem nit picking and fussy to you but it is only proper and inappropriate for an academic piece of writing. It shows respect both to your own work as well as that of others.

Viva Voce Interview

During the viva voce, which takes place at the completion of the extended essay process; you can show what you have learned about the topic, the research process followed, your own learning, as well as outlining new questions you have uncovered.

What is the point of the viva?

- The viva voce is a short interview of between 10 and 15 minutes during which your Supervisor and the IB Coordinator ask you questions about your essay and the process by which you produced it.
- The aim of the viva is to check on plagiarism (i.e. is this all your own work), to give you an opportunity to reflect on the successes and challenges you faced producing the Essay, a chance for you to reflect on what you have learnt and also to help your Supervisor write the report which they will submit along with your Essay to the external examiner.
- The IB give the following examples of questions you might be asked during the viva:
 - “I am not clear what you mean on page XXX. You quote Y: could you explain a little more about what this tells us?”
 - “On page XXX you cite Z. I couldn’t find this reference (for example, a web site). Could you tell me more about it?”
 - “What have been the high and low points of the research and writing processes?”
 - “What were the most interesting aspects of the process? Did you discover anything that surprised you?”
 - “What have you learned through writing this essay? Is there any advice you would want to pass on to someone just starting out on an extended essay?”
 - “Is there anything else that you would particularly like me to mention in my report?”
- The supervisor will use the viva to write the report on your Essay. The external examiner will use this report to clarify any questions they might have about possible plagiarism or malpractice.

How do I prepare for my viva?

- Read through your Extended Essay a couple of times making notes in the margin. It might have been some time since you last read it and you need to become very familiar with it again.
- Read through all the notes you made or the research you did before you wrote the Essay.
- Take some time, a week before the viva and then the day before, to go through the key questions and jot down some answers:
 - What do you feel have been the main successes of your Extended Essay?
 - What do you feel were the main challenges you faced and what practical steps did you take to overcome these?
 - What were the main things you learned from the Extended Essay and the process?
 - Looking back, how could you have improved or bettered your performance across the whole process?
 - Since you have handed the Essay in, what further questions, points or ideas have arisen for you?

How will the viva affect my grades?

- The marks for your Essay will depend primarily on what you have written and submitted as the final version of the Extended essay.
- However your Supervisor will have to complete a report on your Essay and may refer or make use of aspects, which arise in the viva. The Supervisor's report will point to any significant strengths or weaknesses in your Essay and will speak to the authenticity of your work (i.e. that it is yours)

Why should I bother spending time on preparing for the viva?

- The viva is supposed to be a valuable part of your learning and of the Extended Essay process.
- It mirrors what takes place at a number of Universities.
- It is an opportunity for you to grow as a reflective, principled, open-minded
- It is supposed to be enjoyable (at least in retrospect and hopefully during the actual interview).
- If you spend time preparing for your viva you will get more out of the
- **Completion of a major piece of work such as the extended essay is something for you to feel good about. The viva is a celebration of that.**

What feedback will I get from the viva?

- You will not receive any formal feedback from the viva, although you should get a sense of how well it has gone.
- Your Supervisor and IB Coordinator will seek to end the viva on a positive note. Unless there are particular problems, the viva voce should end positively.

Plagiarism

This is your own personal enquiry and you use the information you research to form your own conclusions. You need to support your comments with references to your research and all direct references or use of sources should be footnoted. However, heavy use of quotations will not score highly because you are not demonstrating the qualities of analytical thought and evaluation. If you present other people's work as your own ideas or research, without acknowledging the source directly or by footnotes, this is plagiarism – it is regarded as cheating and will invalidate your essay.

Your supervisor has to sign a declaration that this is all your own work. This can be done because your meetings and discussion of your progress are a way of ensuring you are reading the works for yourself and not relying on textbook summaries. Your supervisor will also conduct a final interview where they question you about your sources and your conclusions. The IB also uses "Turnitin.com" which checks for plagiarism.

You have been well briefed about all the sorts of academic dishonesty, so try to avoid anything that might jeopardize your future. Remember, take this as a chance to learn and grow!

Extended Essay Documents

**Please look at these documents and
have them done by the due date!**



Extended Essay Class of 2018 Extended Essay Feasibility Study

Due Date: November 18th, 2016 to your EE Supervisor

What: THREE Copies of your Extended Essay Feasibility Study (One for your supervisor, one for the EE Coordinator and one for the DP Coordinator)

Directions: On a separate sheet of paper, type your Feasibility Study, making sure to address the following questions. Your responses should be in paragraph form, they should not simply be a list of the questions and answers. Your Feasibility Study may not be more than one page in length, and should be approximately 300-500 words typed in size 12 font.

Upper Left Hand Corner

Your Name: _____

Extended Essay Subject Area _____

EE Advisor: _____

EE Subject Area

Please state your chosen extended essay subject area (History, Physics, Visual Arts) clearly at the top of the page

Topic

- You are now ready to focus your general area of interest into a manageable topic. Your goal here is not to formulate a precise research question – you will likely want to discuss possible research questions with your EE advisor. Last semester you conducted preliminary research within your Extended Essay Subject Area. Now you need to narrow the scope of your area of interest.
- If your EE Subject Area is History, for example, your general area of interest might be the French Revolution. Now you need to determine what aspect of the French Revolution you would like to research.
 - If you do not currently have a copy of the Specific Subject Area Guidelines for your Extended Essay Subject Area, they are available from the EE Coordinator.

Approach

Based on your preliminary research, you now should address two questions.

- **First**, what is the approach you plan to take to address your topic? Consider the approach as a statement of intent that indicates which broad process you are going to use: an experiment, a literary analysis, etc., followed by more specific information.
 - Your Specific Subject Area Guidelines list examples of “Approach”. Some examples taken from the EE Guide are given below:

History: **Topic: Varying Interpretations of the Salem Witch Trials**
Approach: Background reading is undertaken to enable identification

and

explanation of two dominant theories as to why the trials took place. The merits of the two theories are appraised using data obtained about the accused and the accusers.

Physics: **Topic: The efficiency of electromagnetic damping**

Approach: An experimental approach is taken. The energy budget of a coil-carrying glider going through magnetic braking on a linear air track

is

followed by comparing the mechanical energy lost to the thermal energy generated in the coil.

Visual Arts: **Topic: Cultural influences on Pablo Picasso’s work**

Approach: An investigation of the extent to which selected images in Picasso’s work may have been appropriated from other cultural sources.

- Second, how “doable” is this topic?
 - How does this topic allow you to satisfy the assessment criteria for your chosen subject area? Please double-check your Specific Subject Area Guidelines!
 - Is the topic appropriate in scope?
 - Is it too broad, too specific? (Remember, you will continue to narrow your focus when you determine your research question.)
 - Can this topic be effectively treated within 3500-4000 words?
 - The EE is an in-depth study on a clearly identified topic.
 - Avoid overviews or summarizing research within your topic.
 - It is depth over breadth.
 - Is the topic one that can be researched effectively?
 - Is there too little information on your topic?
 - Is it too recent?
 - Has your topic already been researched extensively?
 - Will you be able to shed new light on this topic?
 - For experiments, do you have adequate time for the successful completion, data gathering, data analysis, etc?
 - Does your topic require analysis, discussion, interpretation or evaluation?
 - Does this topic matter to you? Do you think this topic is interesting enough to spend the next nine months researching it?

EE Preliminary Advisement Record

Bring this form to your first meeting with the EE Advisor. You, the student, will need to take notes of the conversation(s). Take notes during the conversation; you will follow up with a summary and action plan on the back of this record. Submit this completed record with your Research Question Assignment. Research Question Assignments will not be accepted without proof of this first meeting.

Name: _____ **EE Advisor:** _____

Subject Area: _____

Topic of Interest within the chosen EE Subject Area:

1.

2.

3.

Possible Research Questions you Might Pose (make sure the number matches the topic number):

1.

2.

3.

Dialogue Notes:

[Empty box for dialogue notes]

EE Supervisor's Signature: _____ Date: _____

Candidate's Signature: _____ Date: _____

EE Preliminary Advisement Summary

Briefly discuss the conversations you have had with your advisor thus far. How has your interaction with your advisor aided you in crafting or refining your research question, and your plan for approaching the question as you begin to outline your paper?

EXTENDED ESSAY RESEARCH QUESTION ASSIGNMENT

DUE DATE: March 3rd, 2017

Directions: Type your responses to these questions separately, and attach them to this assignment sheet by the due date. Be sure to include your name and the name of your supervisor on the lines provided. Your Research Question should be completed while you work on your bibliography and will require setting up at least one meeting with your advisor. Be sure to have your advisor sign off on the line provided before you turn in your assignment.

Candidate: _____

Supervisor: _____ Signature: _____

Subject Area: _____

Type Your Responses to the Questions Listed Below and Attach to the Assignment Sheet

1. Explain your area of interest
2. Why are you writing about this topic? In other words, what do you want to determine or understand about your topic? Be explicit—at this point you should be able to fully explain what you hope to learn from your investigation.
3. What is your research question? Make sure you have posed a question that is arguable.
4. Briefly discuss the conversations you have had with your advisor thus far. How has your interaction with your advisor aided you in crafting or refining your research question, and your plan for approaching the question as you begin to outline your paper?

REMINDER: Be sure to take advantage of the resources included with this assignment. Consult your Advisor, your EE Coordinator, or the Media Specialist, DP Coordinator, if you need guidance.



Extended Essay Class of 2018 Annotated Bibliography

DUE DATE: April 7th, 2017

WHAT: Two copies of your annotated bibliography.

DIRECTIONS: On a separate sheet of paper, type your annotated bibliography using 12 point font. The annotated bibliography must meet the following requirements:

- You must submit a bibliography that contains **a minimum of five** sources. A source is defined as any book, article, or document.
- Your annotated bibliography must include your advisor's signature indicating that the advisor has reviewed it.
- Each source must be accompanied by, in paragraph form, an annotation.

The annotation includes the following information:

- Complete bibliographic information
 - Title, author(s)/editor(s), date, publisher, journal number, etc.
- The source type (book, article, etc.)
- Whether the source is print-based or web-based.
 - For any web-based source include the complete URL and the date accessed with the bibliographic information given above.
- The author's credentials, including any affiliations
 - For websites: if the URL ends with .gov, .edu., or .mil they are fine. If the URL ends with anything else, explain its credentials: affiliations, supporters, etc. Why is the website considered a reliable source?
- The intended audience of the source material.
- The value and significance of the source material.
- Any special features of the source material.
- Any shortcomings or bias in the source material.
- An evaluation of the source material;
 - Compare the source to another you have cited; or
 - Explain how the source is relevant to your topic.

- Each annotation should be approximately 150 words.

Format for your Annotated Bibliography

Upper Left Hand Corner

Your Name: _____

Extended Essay Subject Area _____

EE Advisor: _____

*** Your topic ***

*** A line for your advisor's signature and date ***

1. Complete Bibliographic Citation

➤ Annotation Paragraph

2. Complete Bibliographic Citation

➤ Annotation Paragraph

3. Complete Bibliographic Citation

➤ Annotation Paragraph

4. Complete Bibliographic Citation

➤ Annotation Paragraph

5. Complete Bibliographic Citation

➤ Annotation Paragraph

Sample page from an Annotated Bibliography

230 Annotated bibliography

[187] Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone. *Handbook of Applied Cryptography*. CRC Press, Oct 1996. ISBN 0-8493-8523-7. <http://www.cacr.math.uwaterloo.ca/hac/>. (Ref: p. 60, 226.)

A thick encyclopedia of cryptography covering everything from the number theory (with proofs of all the theorems) to the algorithms (with numerical examples) and the protocols (with discussions of the relative security of possible variations). It is extremely well cross-referenced: the individual items are self-contained and can be referred to by number in any other items upon which they build. Ideal as a reference work, though its size discourages attempts at cover-to-cover reading.

[188] Perry Metzger. "A Parable". Apr 1993. <http://cyberpunks.vanona.com/date/1993/04/mag00559.html>. Originally posted to sci.crypt and alt.privacy.clipper. Now archived in many places on the net: if you can't find it at this URL, search for the author's name and "Ruritania". (Ref: p. 114.)

★ This carefully crafted one-page story about the land of transparent walls, written while the three-letter agencies were heavily pushing the Clipper chip, is a brilliant dramatization of the mechanics and consequences of giving up one's right to privacy. Clipper was later defeated by public outcry, but other initiatives towards legalized mass eavesdropping, including Echelon, Canaveare and RIP, have since taken its place with renewed vigor. Metzger's witty classic is therefore still as topical as ever.

[189] Linda J. Miller and Jean Marx. "Apoptosis". *Science*, 283:1301, 28 Aug 1998. (Ref: p. 105.)

This is a one-page introduction to a special section on apoptosis (pages 1301-1326) containing 5 articles by leaders in the field. The lead article was, "the highly orchestrated form of cell death in which cells neatly commit suicide by chopping themselves into membrane-packaged bits", is described as "one of the hottest in biology". A related editorial elsewhere in this issue mentions "20,000 publications [on the topic of cell death] within the past 5 years".

[190] Martin Minow. "Call Your OPERATER!" *The RISKS Digest*, 16(9), May 1994. <http://catless.ncl.ac.uk/Risks/16.09.html#subj1>. (Ref: p. 123.)

THE OPERATER scam with which Minow has been scooping up the Internet is described as "AT&T's most successful scam since the 1980s".

[191] MIT Oxygen Project. "The Oxygen Project", 2000. <http://oxygen.lcs.mit.edu/>. (Ref: p. 25.)

[192] MIT Auto-ID Center. "The Networked Physical World — Proposals for engineering the networked physical world for engineering, commerce, and automatic-identification". Tech. Rep. MIT-ACS-TR-2000-004, MIT, Dec 2000. <http://www.autoidcenter.org/research/MIT-201000-WR-001.pdf>. (Ref: p. 21, 22.)

Most entries are annotated...

...and include a URL

Back pointers identify the pages in which each reference is cited

NOTE: Although the annotations shown here are too short for your Annotated Bibliography Assignment, it does list all required bibliographic information Including:

- the reference source number in the main bibliography and
- the page number(s) where this research source is cited within the paper.

These last two items can only be done once you have finished your paper. These additional references/citations are included in the final copy to be submitted for grading.