Physics and Computing- A rough guide to completing an EPQ.

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## Introduction

This guide is designed to give a overview so you know exactly what you are letting yourself in for. At first glance getting a whole “AS-Level” without attending any lessons or doing any exams may seem easy, but to be successful you need to learn quite a few new skills and use them effectively and self sufficiently.

If you are not feeling at least a little daunted by starting an EPQ then you don’t know how much work you need to do. ☺.

Everything in this guide is ADVICE not gospel. The whole project is yours to run as you see fit - part of the experience is making the odd mistake and finding out “some” things the hard way ☺

## What do I need to hand in?

Let’s start at the end… **You need to hand in the following documents**

* Project Proposal form
* Project plan
* Reading list
* Dissertation
* Project Log
* Evaluation
* Presentation slide printouts

### Project Proposal form

This is a form that you and your mentor fill in at the start. It needs to have a working title for your dissertation and will record your first couple of goals.

### Project plan

This is a short 3-column table that lists all of the major steps to completing the EPQ. You should add dates that will act as personal deadlines (objectives) for you to aim for. The third column allows you to add notes as to how it will achieve the objective and why you have allocated the specified amount of time. An example of a good project plan is in Appendix 1 - . The template for this table is on the EPQ GoL site.

### Reading list

This is a very important document, both in terms of marks it contributes to by producing and using it (roughly 20%) and your ability to write the dissertation in a well informed manner! We strongly suggest presenting this as another table that clearly shows exactly (Title, Author, Date, Publisher/URL etc..) what information you have looked at while researching, regardless of whether you finally used the information you found. You need to very briefly describe what the source (book, URL, TV documentary, podcast) contains and crucially **WHY you used the source or why you didn’t use it!!!**  An example of a reading list is in Appendix 2 -, the template is on GoL and more guidance on exactly how you should refer to your sources as per the “Harvard System” is also on GoL.

### Dissertation

There is no strict word count, but you should be aiming for between 5000 and 7500 words. You will need to discuss the best structure with your mentor. Typing “Essay Structure” into Google will pull up loads of examples and advice (most of it good). A very basic starting point is:

* Introduction
Write this last, or be prepared to rewrite it a couple of times
* Main Body/Arguments
Often in 2🡪4 sections. Write this first. Be careful that any statement you make is backed up with a reference to your source using a consistent referencing system.
* Conclusion(s )
Make notes for this as you write the main body, then rewrite the conclusion so that it summarises the main body and clearly states what conclusion(s) you have drawn.

Regardless of the structure you choose you should start the dissertation by writing an essay plan that lists the titles of each of the sections.

### Project Log

This is the second most important document you hand in after the dissertation. It carries at least 30% of the marks. It is yet another table that documents what you did and when. It must include when you achieve each of the personal deadlines (objectives) you set in the project plan or if you miss a deadline, a reason why. BOTH are equally important - you only gain marks if you are honest in your log! You should also note down when you meet your mentor and what was discussed. Include in your log how you are feeling about each stage of the process as this will help you communicate with your mentor and help you write an evaluation later on. ON NO ACCOUNT MUST YOU TRY TO LEAVE THE LOG UNTIL THE END… IT MUST BE WRITTEN AS YOU GO. If you come to the end of a week without writing a log entry, then write about why you have been too busy with other work to find time to write an entry. ☺

### Evaluation

This is written at the very end of the project and is about how you feel the project went. You will refer back to your plan and log, making comment about how the objectives changed over the course of the project.

### Presentation slide printouts

You will give a 10 min presentation about your project, probably to fellow students but definitely to your mentor and one other teacher. You need to give a hard copy of your slides/handouts as evidence.

## Where do I start?

**Find a working title**. Don’t worry if it is a bit vague and long, you won’t be able to give an exact title until after your research (or maybe after the work is written).

Decide how you are going to **conduct the research**. Good dissertations are well researched. The **University of Surrey Library** is excellent for maths and science subjects and is searchable online. If you find a book that you would like but it is not available then ask the college librarians. Journal articles are incredibly useful in providing clear evidence for an argument. We have electronic access to many journals (ask the librarians). Web sites are reasonable sources but should be used only IN ADDITION to books, journals, magazines etc..

## What deadlines are there?

The final deadline hasn’t been set but it is likely to be the spring half term.
Here are the Physics and Computing EPQ Milestones:

|  |  |
| --- | --- |
| Tasks | **Deadline** |
| Complete Proposal FormChoose working titleProject PlanChoose research sourcesProject Log showing work done so far | Before summer holidays (9th July) |
| Reading listEssay PlanRefined dissertation titleUpdated Project log | U6 Induction |
| First 1000 words of main body.Check on consistent referencingUpdated reading list Refined dissertation titleUpdated Project log | Oct 1st  |
| At least 2000 words of main bodyAll statements referenced so farUpdated Project log | Autumn Half term (first day back) |
| Main body **draft** finished (~4000 words)Updated Project log | Christmas |
| **Draft** conclusion (~1000 words)Updated Project log | Immediately after Jan exams |
| Edited ‘main body’ and ‘conclusion’Draft Introduction (~1000 words)Updated Project log | At least 1 full week before spring half term. |
| **Final completed Dissertation Hand in** | **Friday 25th February 2011** |
| **Presentation** | Before Easter (Date agreed with mentor) |
| **Final hand in of all documents including evaluation** | Before Easter (Date agreed with mentor) |

1. Example Project Plan

|  |  |  |
| --- | --- | --- |
| Date | Objective | Reason |
| 06/07/09 | Throughout summer holiday research topic and plan the dissertation structures | Not sure the best style to write in. Need to do some general research before specific topics |
| 16/08/09 | Find some information on renewable energy sources | Need to find quality quotable sources |
| 20/08/09 | Extend Knowledge of different Nuclear Reactors | ditto |
| 09/9/09 | Complete Dissertation Plan and show mentor | I don’t write many essays so want conformation that the structure and style of my dissertation is OK |
| 01/10/09 | Write up Reading List with justifications | Aim to keep reading list notesas I research BUT will write-up the reading list before starting the dissertation to clarify which sources are the most useful |
| 01/10/09 | Complete **Draft** Abstract and **Draft** Introduction | I want to try and get a picture in my mind as to what the final work will be saying.. These will no doubt need totally re-writing in the end. |
| 11/10/09 | Complete the Overview of Nuclear Energy in the UK | Need to ensure I have a clear picture of the current situation before analysing and making recommendations  |
| 30/10/09 | Complete the First section of the dissertation on the Sustainability of Nuclear Energy | An intermediate objective to ensure the writing of the main body doesn’t stall |
| 10/11/09 | Complete the Second section of the dissertation on the Alternatives to Nuclear | An intermediate objective to ensure the writing of the main body doesn’t stall |
| 24/11/09 | Complete Final section of the dissertation on the Realistic options for Britain  | An intermediate objective to ensure the writing of the main body doesn’t stall |
| 01/12/09 | Complete the conclusion to the dissertation  | Need to read/edit main body before starting conclusion.. although will make bullet point notes on conclusion as I write main body |
| 08/12/09 | Spell check and Grammar correction of the dissertation |  |

This is how the plan looks at the end of the reading research… the four main body sections were just numbered items until the topics were decided..

The dates for this plan were all very early as the student had several January exams and a large coursework deadline in the spring term.

1. Example Reading List

This is only a very small section of a reading list, hopefully it gives you an idea of the level of detail you should include about your sources and the format to present them

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Source** | **Name of Source** | **Date of Access** | **Summary of Sources** | **Used Y/N** | **Reliability** |
| **Book** | AQA Physics A (AS) by Jim Breithaupt ISBN: 978-0-7487-8282-6 | 19/07/09 | This source is extremely reliable as it an teaching book and hence would have been researched extremely thoroughly. | Y | This had some really good background information on nuclear reactor.  |
| **Web** | <http://ge.ecomagination.com/products/wind-turbines.html> | 20/07/09 | This comes from a supplier of Wind Turbines and hence the manufacturing information I gained reliable, but possibly biased. | Y | I used this as it had good information on the potential of Wind Energy |
| **Journal** | Public Reactions to Nuclear Waste: Citizens' Views of Repository Siting by Riley E. Dunlap, Michael E. Kraft, Eugene A. Rosa.  | 30/07/09 | This source has been researched thoroughly as it is part to a wider research project and hence the source is very reliable. | N | I didn’t use this as this was above my level of knowledge and was really for academics.  |
| **Media** | [www.independent.co.uk/environment/green-living/nuclear-containers-likely-to-fail report.html](http://www.independent.co.uk/environment/green-living/nuclear-containers-likely-to-fail%20report.html) | 10/08/09 | The source is from the media so caution is needed when using the information. However with this source it is clear where they have obtained their information and hence the source is reliable. | Y | This had some insightful information into Nuclear Waste Management |
| **Magazine** | The Structural Engineer Volume 87 3 November 2009Article on Wind Turbines  | 03/11/09 | The source is from the media so caution is needed when using the information. However with this source it is clear where they have obtained their information and hence the source is reliable. | Y | This had a fascinating article on how innovative designs can incorporate green power sources into a high-rise buildings to power it |
| **E-book** | <http://www.greenpeace.org/raw/content/international/press/reports/epr-factsheet.pdf> | 03/11/09 | This source is then most controversial of all the sources I have used. Greenpeace has not been known for accurate data and I therefore have used this information with care, checking where the information was taken from. It seems that they did indeed look at a report, hence I believe the source is very reliable when it talks about the Nuclear Plant in Finland, however the information about the Nuclear plant in France is less reliable.  | Y | It has some useful information on the technical difficulties of the new EPRs in Europe. |

1. Example Project Logs

**Example 1** is a very quick bulleted list with dates and what you have done, you need to be careful that you can see if you are meeting the targets you set yourself if you use this style.

**Example2** uses the same table as the project plan so it is very clear when targets are met. You need to avoid the temptation of only adding entries for targets. Your log should be ongoing with entries being made at least weekly.

### Example 1 --- simple date and blurb

* 15th July: I started to research on the internet about the overall topic and the progress that has been made in the UK so far.
* 22nd July: I created a draft structure plan for my dissertation. I outlined different sections of the dissertation and gave an overview of what was to be written in each section.
* 23rd July: Started to put together a reading list with a summary of the contents of the source. This also includes the location of the sources, websites or ISBN’s.
* 30th July: Got in contact with a senior high speed rail expert in Atkins plc and arranged a meeting to discuss my plan and any further ideas
* 10th August: I wrote the draft introduction of the dissertation giving a brief summary of the different aspects of the question I would write about.

### Example 2 – Linked back to plan

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date | Targets | Target Date | Achieved Date | Description of Work |
| 06/07/09 | Throughout summer holiday must research topic and plan the dissertation | 07/09/09 | 02/10/09 | The internet was the main source of research, but also as I was working at a Civil Engineering business I also received research from the employees. |
| 16/08/09 | Find some information on renewable energy sources | 01/11/09 | 03/11/09 | This again came mainly from the internet, but also from Engineering magazines. |
| 20/08/09 | Extend Knowledge of different Nuclear Reactors | 07/09/09 | 07/09/09 | This mainly consisted of researching the different types of old reactor in the UK (and how that affected their decommissioning), but also researching the new type of reactors that will be built in the UK, |