

Extended Essay

Group 4

Science

Student Training
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Overview

- Must take the form of a research paper involving a hypothesis , model, or critical analysis. Remember the scientific method.
- Must demonstrate argumentation, comparison, or the extraction of relevant information or data

A correctly formatted and executed lab report could meet this criteria.

- Must have an emphasis on a specific branch of science—Biology, Chemistry, or Physics

Overview (cont.)

- The purpose SHOULD NOT BE to inform the reader about a specific topic, nor should it be a summary of the latest discoveries in the specific branch of science.
- You should be personally involved with the subject matter and not simply an informant.

Performing an experiment will help to ensure your involvement.

Research Approach

- **Data-Based:** location and extraction of raw or processed data, not collected directly by the student, which is then further defined and analyzed.
- **Experimental:** design and implementation of an experiment, then personal collection and analysis of the data.
- **Theoretical (numerical):** development of a quantitative or semi-quantitative description of some physical phenomenon, exercise of the model, predictions about its behavior and limitations.
- **Survey:** formulation of a cohesive, ordered, analytical and supported (qualitative and quantitative) discussion of the topic.
- **Combination:** a mixture of these approaches

Firsthand Experiments

- Choose sensible and feasible experiments that do not require extensive lengths of time for the construction of the apparatus.
- Highly sophisticated instruments are not required.
- It is recommended that the experiment be carried out under the direction of a school supervisor.
- If the research is carried out at a research institute or university under the guidance of an external supervisor, a cover letter outlining the nature of the supervision and the level of guidance provided must be submitted.

Research Topics

- Choose a research topic that can be treated effectively within the word limit and is not of a trivial nature.
- Can be in the form of a question:
 - Do wine bottles of different shapes behave as helmholtz resonators?
- Can be presented as a statement or a hypothesis:
 - The objective is to establish the relationship between power and temperature of an incandescent lamp.

Sample Research Questions

- Can a program of training at high altitude have an impact on the fitness of the athlete?
(Biology)
- Does the time it takes to brew a cup of tea using a specific brand of tea leaves significantly alter the amount of caffeine dissolved in the drink? (Chemistry)
- Is it possible to determine the presence of a black hole at the center of the Milky Way?
(Physics)