Research Report in IB Sciences
Quick Check List

Introduction

Aspect 1: Introducing the research

- The ideas/process/situation being investigated and the research question in general are introduced
- Authoritative sources from which you get any background info/theory are cited

Aspect 2: Describing the theory

- Background theory/equations relevant to understanding the research is discussed
- Predicted results are stated and explained, based on the background info/theory/equations
- Any special processes being studied are described and discussed

Aspect 3: Describing special techniques

- Any special techniques employed in the research are described and discussed, if necessary

Design

Aspect 1: Defining the problem and selecting variables

- Research Question is clearly stated and includes independent and dependent variables
- Independent and dependent variables are specifically identified
- **Several** controlled factors are identified (Factors, apart from the independent variable, that could alter your measurements)

Aspect 2: Controlling variables

- Equipment set-up is clearly explained. Labeled diagram is included, where appropriate
- Range of values of the independent variable to be tested is stated.
- Important factors/quantities which must be controlled in the set-up and procedure are identified.
- Techniques used to control each are described.
- Appropriate measurement techniques have been selected

Aspect 3: Developing a method for collection of data

- Each quantity that must be measured, how it was measured, how it was varied, and how many different points taken/what range covered is described.
- Data collected relates directly to the Research Question
- A sufficient range of the independent variable is tested
- An appropriate number of trials are carried out
- Literature/worksheets consulted for techniques are referenced

Data Collection and Processing

Aspect 1: Recording raw data

1. All appropriate data is recorded (both qualitative and quantitative)
2. Correct units and uncertainties are given for all data.
3. All raw data is recorded to the correct level of precision (correct number of significant figures)
4. An appropriate format has been used to display the raw data
5. Table has a meaningful title and column headings that allow for easy interpretation of the data
6. Units and Uncertainties are given with column headings
7. Table caption should explain how the uncertainty values were derived. (if you don't do so elsewhere)

Aspect 2: Processing raw data

1. Data are processed using the correct technique/type of calculation
2. Calculations are done correctly (including units and uncertainties)
3. Appropriate quantities have been graphed

4. Percent Error calculated where appropriate

Aspect 3: Presenting processed data

- Calculations are to the correct level of precision
- Sample calculations are shown for **every** type of calculation carried out
- Uncertainties in raw data have been taken into account in calculations
- Processed data are displayed in a table, where appropriate
- An appropriate format is selected to display processed data and to show patterns and relationships
- Graphs/ tables/ calculations have labels and captions clearly describing contents
- Graph axes have labels and units
- Graph axes are manipulated(1/x, x2, etc) to obtain a straight line graph, where appropriate
- Linear fit is shown (no "dot-to-dot")
- Graph showing uncertainty in slopes and intercepts is shown, where appropriate

Conclusion and Evaluation

Aspect 1: Concluding

- Results are clearly stated and discussed.
- Results directly relate to the Research Question
- An equation(s) with uncertainties relating the variables is derived, where appropriate
- Trends and patterns are identified/ compared and explained
- Systematic and random errors affecting the results are discussed
- Experimental values are compared to literature values, where appropriate
- Any literature consulted is correctly referenced
- How strongly the conclusions are supported by the results is discussed
- The tested range and situation to which the conclusions may be applied is noted

Aspect 2: Evaluating procedure(s)

- Specific weaknesses in the design of the method (processes, techniques etc) are identified
- Specific weaknesses in carrying out the experiment (use of equipment, time management etc) are identified
- The effect of each identified weakness on the results is discussed (random or systematic, and if systematic, which direction it will skew your results)
- The quality of the data is commented on (can include precision and accuracy of measurements)

Aspect 3: Improving the investigation

- Specific suggestions to improve/avoid each identified weakness are given (including modifications to experimental techniques)
- Suggestions may include how to reduce random error, remove systematic error, and obtain greater control of variables
- Suggestions are realistic and specific
- Suggestions for further research are given

Writing and Presentation

Presentation

- Name and date. Title. Sub-titles.
- Font consistent throughout the report for titles, subtitles, and text.
- Tables/Figures/Graphs & Captions not split across pages.

Writing

- Proofread your report aloud.
- Language is concise, clear, familiar, and precise.