**IA Written Lab Report Format**

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APES/IB ESS

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**Title**

The Effect of Acetic Acid on the Growth Rate of Terrestrial Algae (*Palmelloid sp.)*

Reflects what is being done; Includes IV and DV; Includes common and scientific names (in italics).

**Background Research**

*Paragraph form*; Describe your preliminary literature research; In-text citations in MLA style; Discuss the IV and DV; Why choose a certain DV and IV over another; How the ranges/increments for IV and DV were decided; Explain your consideration for the normal variation in biological systems.

**Research Question**

*One question or short statement;* Includes the IV and DV; Format to be “What is the effect of *(IV)* on *(DV)?;* May also state what the experiment is supposed to test (what is the purpose of this experiment?)

**Hypotheses**

*One or two sentences*; Use the “*If… then… because”* format (If *(IV), then (DV), because…);* Explain the hypothesis by using information gained from preliminary research; In-text citations.

**Variables**

A *chart or list* of the independent, dependent, and all controlled variables; Include units and uncertainties; State how each controlled variable was maintained (controlled) during the experiment; State one possible effect for each variable if it were not controlled.

**Materials**

*List*; All materials used; Specific sizes (100 mL graduated cylinder); Solutions with concentrations and quantities (5 mL of 1M NaOH); Quantities of solids (7 g Gelatin powder, FaoXing Biotech Company); Equipment (ProScope, Vernier Company, Model 33-0A).

**Data Collection Method**

*Numbered steps*; Describe how to collect DV data; Include a step to collect qualitative data; Include preliminary trials and equilibration periods; State the degree of accuracy of measuring devices including units and uncertainties (5.0 mL ± 0.5); Sufficient data with a minimum of five data ranges and five data values within each range (5x5 model); Relevant data directly related to the research question;

**Annotated Photographs/Diagrams**

*Photographs* or *diagram*; Annotate to describe how variables were manipulated; Indicate the control.

**Raw Data**

*A table*; Organize the DV data collected during the procedure; Table title includes IV and DV; The IV increments are listed on top; Five trials listed on the left; Units are stated for IV and DV; Uncertainties (±) are stated in a column heading; Same level of precision (significant figures) is used for all data; Data table is on one page (not split); A second table includes qualitative data (colors, odors, etc.).

**Data Processing**

*Paragraph form*; Explain how the raw data has been processed; (must include mean and standard deviation for every lab, sum labs may require additional statistical processing), Justify how the processing will allow the research question to be answered; Show an example of how to process one raw datum; Include formula used as part of the explanation; If data processing utilizes a graph, explain how it is used.

**Processed Data Presentation**

*Table form*; Table title includes IV and DV; X and Y axes include labels, units, and uncertainties; Error bars included; Best line of fit included; Graphed data reflects correct use of significant figures.

**Conclusion**

*Paragraph form*; First sentence indicates the data either support or refute the hypothesis (not “proves”, not “incorrect”); Next, justifying the conclusion by referring to specific graphed or processed data; State trends and patterns with reference to graphed data (including line of best fit and error bars) and statistical results (standard deviation, etc.); Establish valid results by comparing your results to any known or accepted results from the literature (cite the literature).

**Evaluation**

*Paragraph form*; Discuss sources of error; Comment on how the quality of the data may have been affected (remember that experimental results are only estimates, and even with error should not be considered worthless); Discuss procedural problems; Discuss the precision (and imprecision) and accuracy of your measurements; Comment on the meaning of the error bars and statistical analysis in terms of valid, reliable data; Address what improvements could be made based on the stated weaknesses (what modifications to the procedure may produce more valid and reliable results by reducing error); How much of the variation in the data is simply due to normal variation in the organism? Modifications are realistic.

**Works Cited**

*Alphabetical list*; MLA Format;