

Internal Assessment Checklist for IB Biology: Personal Engagement and Exploration

Overall

- ___ EACH experiment is INDIVIDUAL and demonstrates personal interest and initiative
- ___ EACH design investigates/ aims to test a DIFFERENT independent variable
- ___ Title for investigation is included and is thorough/ relevant/ clear/ specific
- ___ Abbreviations are only used AFTER they are fully written out

Purpose

- ___ Written as a 4-sentence **problem statement** (Purpose, IV, DV, controlled variables)
- ___ Purpose is SPECIFIC/ FOCUSED
- ___ Common names AND genus/ species names of specimens are included (where applicable)
- ___ All variables are CLEARLY identified (“The independent variable is... The dependent variable is...”)
- ___ All variables are RELEVANT to the investigation
- ___ Controlled variables are specific, relevant, and thoroughly considered and Included
- ___ 2-3 sentences after problem statement to justify the research question (through *personal* explanation)

Research Question

- ___ Written as 3 sentences only:
 - a. Research question
 - b. Summary of methods to be used (how will data be collected)
 - c. Why (explanation of WHY data will be collected this way)
- ___ Research question is focused, clear, and specific
- ___ Common names AND genus/ species names of specimens are included (where applicable)

Background Information

- ___ Includes relevant background information that:
 - a. Places the investigation in appropriate scientific context AND
 - b. Enhances the reader’s understanding of the investigation
 - c. Includes footnote citations in APA format
- ___ Summarizes the method(s) to be used for data collection with consideration for:
 - a. Controls
 - b. Safety
 - c. Ethical awareness/ issues
 - d. Environmental awareness/ issues

Prediction (hypothesis)

- ___ States the predicted outcome of the experiment
- ___ Thoroughly explains the prediction using relevant, detailed, credible scientific content (with footnote citations in APA format)

Method

A. Variables

- ___ Written in DATA TABLE format (*Example below)

Column 1: **Variable type (IV, DV, or controlled)**

Column 2: **Variable name**

Column 3: **How variable will be controlled/ measured/ monitored**

- ___ Descriptions/ explanations of HOW all controlled variables will be maintained at constant values are included
- ___ Timing of measurements and adjustments for maintaining controlled variables at constant values are included
(Example: if temperature is a “controlled variable” it should be noted **when, how, and how often** to check the temperature and how, specifically, to adjust it if necessary. Temperature could also be “controlled” by conducting your experiment in one, specific area, so that all control/ test groups experience the same range of temperature fluctuations, although a RANGE of temperatures experienced during testing would need to be measured/ included for repeatability)
- ___ Methods described for controlling variables are specific, effective, and repeatable (including the accuracy (+/ -) to which variables should be measured and the specific equipment used to do so)
- ___ EVERY significant/ relevant controlled variable is included in the data table (from your purpose – make SURE THESE ALL MATCH!)

*EXAMPLE VARIABLES TABLE

Variables

Variable type	Variable name	How variable will be controlled/ measured/ monitored
Independent	The color of light each plant is exposed to (red, yellow, blue, green, white)	
Dependent	The mass of each plant prior to being watered each day (measured in grams, +/- 0.5g)	
Controlled	1. Amount of water each plant receives	1. a. Using a 100ml graduated cylinder, measure out 300ml of tap water and pour into a 500ml glass beaker. b. Pour 300ml of tap water evenly on the SOIL of the plant. c. Repeat for each plant. d. Repeat watering every other day at the SAME time of day for a total of 14 days.

B. Materials

____ ALL required materials are specifically listed and numbered under the heading **“Materials”**

____ Materials list is SPECIFIC and includes:

- a. names/ models/ manufacturers of equipment/ complex apparatuses
- b. volumes/ sizes of tubes/ cylinders/ containers etc.
- c. type of equipment (plastic/ glass/ mercury/ digital etc.)
- d. concentrations and amounts of solutions etc.
- e. quantities of each item (Example: 3 glass (pyrex), 150ml beakers)

C. Safety/ Risk Assessment

____ Relevant, thorough, and specific safety guidelines are included (in list form under the heading **“Safety/ Risk Assessment”**)

D. Procedure

- ____ Procedure is written in numbered, ordered, SPECIFIC steps (under the heading “**Procedure for Data Collection**”)
- ____ Method described provides for collection of SUFFICIENT relevant data (5x5x5)
- ____ Accuracy to which variables are measured (+/-) is clearly stated (including SI units)
- ____ Data collected covers and is within an adequately **broad range** so as to fully address the purpose of investigation
(Example: if testing the effects of pH on enzyme activity, testing a pH range of 4-6 would NOT allow for sufficient, relevant data to be collected. A broad range of pH’s (along the entire range of the pH scale, such as within the range of 1-14) should be included. Additionally, a FULL array of pH’s should be tested within the range of 1-14, as only testing pH 1, pH 7, and pH 14 would also be insufficient)
- ____ Specific steps for HOW and WHEN to take measurements (including accuracy to which to measure variables +/-), make solutions, use equipment, and control variables are included
- ____ Steps are SPECIFIC and repeatable (anywhere in the world), logically ordered, and easy to follow
- ____ Timing for data collection is included (including time before experimentation for equilibration of equipment/ specimens etc., timing for making and validating solutions etc., data collection intervals, controlled variable measurements for reliability, and sufficient experimental duration)
- ____ Relevant safety guidelines are *referenced* where necessary in the procedure
- ____ Any standard methods (standard practice or procedure provided by a website/ textbook etc. or provided by a company for a specific piece of equipment) are fully referenced (APA citation using footnotes)

E. Diagram (s)

- ____ Accurate, detailed, LABELED diagram(s) of the set up of the experiment are included (either within the steps of the procedure or following the procedure)
Note: Diagrams may be photographs, word processed images, OR neatly hand drawn images