IA Write-Up Checklist

Design

Aspect 1: Define the problem and select the variables

- ☐ Research Question or Aim clearly stated
- ☐ RQ/Aim includes IV and DV
- ☐ Background to investigation included
- ☐ IV correctly identified with units/ range
- ☐ DV correctly identified with units and precision

If a hypothesis is required:

- ☐ It is quantitative
- ☐ A sketch graph is included, with explanation
- ☐ Prediction is explained using scientific theory
- ☐ Sources are cited

Aspect 2: Controlling variables

- ☐ Method to manipulate IV, including specific details of range or increments
- ☐ Method for recording results, including units and uncertainty of tools (± _____)
- ☐ Annotated photo of equipment or experimental set-up
- ☐ Full citation of published protocol, if used

Controlled variables presented as a table:

- ☐ List all variables to be controlled

For each variable:

- ☐ How could it impact the results?
- ☐ Exactly how will it be controlled? (Value, with method for achieving that value.

Aspect 3: Developing a method for collection of sufficient relevant data

- ☐ How will results be presented? Reason.
- ☐ What statistical test(s) will be used? Why?
- ☐ Does plan to collect data address RQ?
- ☐ Min. 5 increments over a suitable range for the IV (unless comparing populations)
- ☐ Explain how range of IV was selected.
- ☐ Sufficient repeats at each increment to ensure reliability and allow for stats.
- ☐ Method clearly presented in step-wise format and can be repeated by others.
- ☐ Safety/ ethics concerns addressed, including *animal experimentation policy*.

Data Collection and Processing

Aspect 1: Recording Raw Data

- ☐ Table presents only raw, unmodified data
- ☐ Title outlines the investigation
- ☐ Units of IV and DV present and correct
- ☐ Uncertainties correct (± _____)
- ☐ All data are recorded correctly
- ☐ Decimal points consistent throughout
- ☐ Decimal points consistent with precision of the measuring equipment
- ☐ Associated qualitative data (observations) MUST be recorded or zero awarded.

Aspect 2: Processing Raw Data

- ☐ Calculations to determine DV carried out, if necessary
- ☐ Calculations or statistical tests appropriate to investigation and address RQ
- ☐ Mathematics correctly applied
- ☐ Worked example calculations given
- ☐ Processed data (and decimal places) consistent with precision of recorded data
- ☐ Uncertainties adjusted to reflect any calculations carried out.
- ☐ Standard deviations included where appropriate

Aspect 3: Presenting Processed Data

- ☐ Separate processed data tables from raw data tables for clarity of presenation
- ☐ Titles self-explanatory and complete
- ☐ Consistent decimal places
- ☐ Uncertainties/ errors included
- ☐ Appropriate choice of graph
- ☐ Graphs clear, no funny colouring
- ☐ Axes labeled clearly, including metric/ SI units and uncertainties of values
- ☐ Axes scaled appropritely
- ☐ Error bars included, unless insignificant
- ☐ Error bar source (e.g. standard deviation) stated and data are correct
- ☐ Best fit line produced by you, not Excel.

Conclusion and Evaluation

Aspect 1: Concluding

- ☐ Patterns and trends in data stated, with reference to the graph/ tables.
- ☐ Comparisons, if appropriate, are made
- ☐ Data related to hypothesis or RQ – to what extent to they agree/ disagree?
- ☐ Scientific explanation for results
- ☐ Associated qualitative data add value to explanations.
- ☐ Appropriate language used *"Supports my hypothesis"* (not 'proves' or 'is correct')
- ☐ Comparison with published data, if possible.
- ☐ Sources cited appropriately

Aspect 2: Evaluating procedures

- ☐ Reference to error bars (or STDEV) with regard to suggested reliability of results
- ☐ Explanation of reliability of results
- ☐ Are data sufficient to address the RQ?
- ☐ Was the range of the IV appropriate?
- ☐ Explain any anomalous data points.
- ☐ Associated qualitative data referred to.

Evaluate *random biological variation*, *measurement/ instrument errors*, *systematic error* (problems with the method) in terms of:

- ☐ Possible effect on data
- ☐ Significance of the weakness or limitation in terms of the data set

This can be clearly presented in a table.

Time management or *human error* may be mentioned, though these are not scientific errors – they should be eliminated with good practical skills. The focus here should be on *the investigation*.

Aspect 3: Improving the investigation

For each weakness or limitation mentioned above, how could improved experimental design remove or reduce the impact of the error in terms of:

- ☐ Techniques used to collect and record data, including precision of equipment
- ☐ Design of the investigation, including range of values chosen and repeats of each IV data point
- ☐ Realistic and achievable improvements

Essential Extras

Safety and Ethical Working

- ☐ *Animal experimentation policy* supported
- ☐ Appropriate risk assessment completed
- ☐ Safety precautions taken throughout
- ☐ Instructions followed carefully
- ☐ Design of investigation minimizes environmental impacts
- ☐ Safe disposal and reduced wastage
- ☐ Data are authentic and not fabricated

Academic Honesty

- ☐ Council of Biological Editors (ISO 690 Numerical on MS Word) format
- ☐ In-text citations superscripted
- ☐ Citations in correct order
- ☐ Works Cited section in correct order
- ☐ Quotations in italics and quotation marks
- ☐ Images given a 'fig x' legend with short description and cited as in-text citations
- ☐ Academic honesty statement signed on coversheet of write-up

Formatting

- ☐ Title reflects investigation
- ☐ 1.5 line-spacing
- ☐ Grammar and spell-checked
- ☐ Clear font, no funny colour-schemes
- ☐ Sentences and sections are not split on separate pages.
- ☐ Logical order, with headings clear

Submission

- ☐ One printed copy
- ☐ One digital copy to student submissions
- ☐ Plagiarism checked