

| CATEGORY Score | 5 - exemplary | 4 – well done | 3 - accomplished | 2 - developing | 1 - beginning or incomplete | 0 – not college level work |
|--|---|--|--|--|--|--|
| Introduction Background information. <i>10 points – score x2</i> | Uses scientific sources to provide context for the experiment and explain the relevant scientific principles. | Uses scientific sources to provide some context for the experiment and explain the relevant scientific principles. | Some introductory information, but missing some major points or some of the information provided is irrelevant. | Very little background information provided. | Information provided is incorrect. | Very poor. Little to no correct background information is provided. |
| Introduction Organization <i>5 points</i> | Starts out broad and gradually focuses in on the specific experiment. Section is cohesive. Ends with a clearly stated hypothesis. | Starts out broad and gradually focuses in on the specific experiment. Ends with a clearly stated hypothesis. However, organization needs work. | Introduction is not cohesive. No connections between paragraphs or ideas. <i>Or</i> Hypothesis is at end of intro but is unclear or unscientific ex:“I believe” or “I will prove”. | Organization needs work. Individual paragraphs contain multiple, disjointed ideas. <i>Or</i> hypothesis is stated in the beginning or middle of the introduction. | Immediately jumps into study system without providing any broader context. <i>Or</i> no hypothesis is stated. | Very poorly organized and no hypothesis is stated. |
| Methods Study system <i>5 points</i> | Both study species properly introduced with relevant details. | Both study species introduced, but one species needs a more detailed introduction. | Both study species introduced, but both species more information. | Both study species introduced with multiple irrelevant details. | Only one species is introduced. | No study system. |
| Methods Description of the experiment <i>10 points – score x2</i> See list at end of rubric. | No major or minor mistakes in the description of the experimental design or statistical analysis. | One or two minor mistakes in the description of the experimental design or statistical analysis. | Three to four minor mistakes in the description of the experimental design or statistical analysis. | One major mistake in the description of the experimental design or statistical analysis. | Two or three major mistakes in the description of the experimental design or statistical analysis. | Four or more major mistakes in the description of the experimental design or statistical analysis. |
| Results Text <i>5 points</i> See list at end of rubric. | No major or minor mistakes in the results section text. | One or two minor mistakes in the results section text. | Three or four minor mistakes in the results section text. | One major mistake in the results section text. | Two or three major mistakes in the results section text. | No text. |
| Results Statistics <i>5 points</i> See list at end of rubric. | No major or minor mistakes in the statistics. | One or two minor mistakes in the statistics. | Three or four minor mistakes in the statistics. | One major mistake in the statistics. | Two or three major mistakes in the statistics. | No statistics used. |

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| Results Figures and Tables <i>5 points</i> | No major or minor mistakes in the figures or tables. | One or two minor mistakes in the figures or tables. | Three or four minor mistakes in the figures or tables. | One major mistake in the figures or tables. | Two or three major mistakes in the figures or tables. | No tables or figures. |
| Discussion Interpretation of results <i>10 points – score x2</i> | All important trends and data comparisons are interpreted correctly and discussed. Good understanding of results is conveyed. Includes a strong discussion of original hypothesis and why it was or was not supported. | All results correctly interpreted with one minor mistake. Good understanding of results is conveyed. Includes a discussion of original hypothesis and why it was or was not supported. | One major mistake in interpreting results. Or two minor mistakes. Weak understanding of results is conveyed. Weak discussion of original hypothesis and why it was or was not supported. | Two or more major mistakes in interpreting results. Weak understanding of results is conveyed. | Very incomplete or incorrect interpretation of trends and comparison of data indicating a lack of understanding of results. Little or no discussion of original hypothesis and why it was or was not supported. | All results incorrectly interpreted. No discussion of original hypothesis. |
| Discussion Connections <i>5 points</i> | Strong connections made to similar research and underlying principles and theory explaining the work. | Good connections made to similar research and underlying principles and theory explaining the work. | Weak connections made to similar research. <i>Or</i> weak connections to underlying theory explaining the work. | Weak connections made to similar research and weak connections to underlying theory explaining the work. | Little or no connection to similar research. Or little or no connection to underlying theory. | No connections to other research. No connections to underlying theory. |
| References <i>5 points</i> | All sources are accurately cited and references following ESA format. All sources are appropriate. | All sources are accurately documented, but 1 or 2 are not in the correct format. All sources are appropriate. | All sources are accurately documented, but 3 or more are not in the correct format. <i>Or</i> one or two inappropriate sources. | Three or more non-scholarly sources. | References are not directly cited in text. | Contains no scholarly or peer reviewed sources. |
| Mechanics <i>5 points</i> | All grammar/spelling correct and very well-written. Mature, readable style. Good example of scientific writing. | Fewer than 5 grammar/spelling errors, mature, readable style. Majority of the writing is scientific. | Fewer than 10 grammar/spelling errors. Often uses unscientific writing. | Occasional grammar/spelling errors, generally readable with some rough spots in writing style. | Frequent grammar and/or spelling errors, writing style is rough and immature. | Frequent grammar and/or spelling errors, writing style is difficult to understand. |
| Appearance & Formatting <i>5 points</i> See list at end of rubric. | All sections in order, well formatted, sections and subsections are labeled. Formatting enhances readability. Succinct, descriptive title. No title page. | One minor formatting or appearance mistake. | Two or three minor formatting or appearance mistakes. | One major formatting or appearance mistake. | No evidence of formatting. | Formatting impedes understanding. |

METHODS - NARRATIVE

5 minor mistakes = 1 major mistake

Minor mistakes

- A minor detail is omitted, each detail omitted counts as 1 minor mistake – for example randomization (if appropriate), tool or instrument used.
- A minor mistake in the description – for example a date is incorrect by one or two days, replication is incorrect
- And other minor mistakes not yet explicitly mentioned.

Major mistakes

- Replication not indicated.
- Not written in past tense.
- Includes a bulleted list of materials used.
- Doesn't include a description of all the dependent variables.
- Doesn't include a description of the statistics used.

RESULTS – TEXT

5 minor mistakes = 1 major mistake

Minor mistakes

- Redundant sentence
- A figure or table is not mentioned in the results section text.
- One figure or table is mentioned out of order.
- And other minor mistakes not yet explicitly mentioned.

Major mistakes

- Results are interpreted or explained.
- Long, redundant results section that repeats information (like averages, standard deviation) already presented in figures or tables.
- Results section text is not a single paragraph at the beginning of the results section.

RESULTS - STATS

5 minor mistakes = 1 major mistake

Minor mistakes

- Doesn't include the actual p-value, instead just presents $p < 0.05$ or $p > 0.05$.
- p-values or t-statistics are presented with more than 4 significant figures.
- Degrees of freedom number is not a subscript.
- And other minor mistakes not yet explicitly mentioned.

Major mistakes

- Statement of significant difference when $p > 0.05$
- Statement of no difference when $p < 0.05$
- Statistics not presented for a dependent variable.
- Statistics presented or repeated in the discussion section.
- Incorrect statistics (t-statistic or p-value is wrong).

RESULTS – FIGURES & TABLES

5 minor mistakes = 1 major mistake

Minor mistakes

- Not enough information is presented in caption.
- Statistics are repeated in the caption.
- A legend is included when it is unnecessary.
- A legend is missing when it is necessary (ex: box plot).
- And other minor mistakes not yet explicitly mentioned.

Major mistakes

- Missing standard error bars when appropriate.
- No captions.
- Missing x or y-axes labels.
- A figure or table is redundant.
- Includes t-test table from excel.
- A figure includes individual replicates and not averages (median, etc).
- A figure includes multiple variables in the same figure that shouldn't be presented together (for example pH and dissolved oxygen sharing the same y-axis).
- A figure that should include multiple lines or bars (like box plots comparing fertilizer and control treatments) is separated into two figures.

FORMATTING & APPEARANCE

Minor mistakes

- Methods section doesn't include subheadings.
- Title is vague (for example: Herbivory lab report).

Major mistakes

- Weird spacing or font size to make paper appear longer
- No title
- Includes a title page
- Sections are not labeled

