

Environmental Science Lab Preparation of a Scientific Paper

- I. Purpose
 - a. This assignment will familiarize students with the format and structure of a scientific paper.
 - b. This assignment will provide a way for students to organize and present data collected in class in a way acceptable to the scientific community.
- II. Scientific paper

A scientific paper may contain the following parts.

 - a. The Descriptive Title
 - b. Abstract. Your paper in BRIEF.
 - c. Introduction. Brief history of topic; purpose of experiment; description of area sample, etc.
 - d. Materials and Methods. May be referenced to a lab handout, lab manual, or book if they are identical.
 - e. Results. Only the results. NO discussion here.
 - f. Discussion. Discuss the significance of the results, how they vary from the expected, and what they mean.
 - g. Conclusions. (Summary) Relate back to purpose (s).
 - h. Literature Cited. All direct statements must have a reference: lab handouts, journal, books, etc.

General Remarks

- Be concise and accurate!
- Use the third person presentation.

Correct: "After one week the flies were transferred"

Incorrect: "After one week I transferred the flies"
- Use numerous references from the literature. Always indicate the source of information using the author and date in parentheses.

Example: It was learned the (Juniper 1972) benthic macroinvertebrates. . . .

Use primary sources whenever possible.

Report secondary sources as follows:

Example: Powell (1858, cited by Forbes 1900) found the process. . . .
- In scientific writing do NOT use footnotes except for added information.
- Figures, including maps and graphs, must be identified and explained by caption. Provide scale and direction when necessary. Figures and tables must be referred to in the text of the paper and put as close to their citation as possible, not in the appendix.
- If in doubt about style, study copies of articles in scientific journals and /or textbooks.
- Literature cited refers ONLY to unique information, not everything read. Everything in italics should (MUST) be underlined.
- Genus names are ALWAYS capitalized, species names are not. Both are ALWAYS underlined.

CHECKLIST FOR THE RESEARCH PAPER

(Taken from the Writer's Guide for Life Sciences by Arthur Biddle and Daniel J. Bean)

1. Descriptive title: Does the title tell the reader what you did and what material you worked with? (Sample available, p. 97 of Writer's Guide)
2. Abstract: Is the abstract 250 words or less? Do you tell why and how you did the experiment and what the results and conclusions are? Do you use the past tense throughout the paper?
3. Introduction
 - a. Have you presented all the important literature?
 - b. Are all references properly cited?
 - c. Have you summarized your project and conclusions?
4. Methods and materials
 - a. Are your methods clear enough to be followed by another researcher?
 - b. Have you used prose rather than tabular form?
 - c. Have you included all necessary citations?
 - d. Have you indicated your statistical methodology, if necessary?
5. Results
 - a. Are tables and figures properly constructed, labeled, and ordered?
 - b. Does the narrative indicate the significance of each table and figure and of the statistical results?
6. Discussion
 - a. Do you review your results and compare them to the literature discussed in the introduction?
 - b. Do you point out areas for new research?
 - c. Do you present your conclusions on the problem?
7. References cited
 - a. Have you listed all the references cited and only those cited?
 - b. Are references in alphabetical order?
 - c. Are the citations complete and accurate?