

# Limnology Lab Report Rubric

Lab Report # \_\_\_\_\_ Authors' name: \_\_\_\_\_

CONTENT	Unsatisfactory 0	Borderline 1.5	Satisfactory 3	Exemplary 4.5	Score
<p><b>Title Page</b> Title, course, instructor, semester</p>	Missing more than two of the following (course, instructor, semester), or the title, or the name; Title is lacking all together	Missing two of the following (course, instructor, semester), except title or name; Title is insufficient by not being informative of the report content	Missing one of the following (course, instructor, semester) except title or name; Title is too long and provides too much information that is not concise or indicative of the topic	Contains title, name, date, course, instructor, semester; Title is a clear and concise statement that indicated the topic that you are writing on	
<p><b>Introduction:</b> Explanation of topic</p>	No introduction is provided	Gives very little information; Consists of only 1 or 2 sentences	Gives too much information, more like a summary. Length more > 5 sentences	Presents a concise lead-in to the report by explaining what the topic of the report is; defines any broad topic / title topic terms that provides the reader with a background of the report; Length should be limited to 3-5 sentences	
<p><b>Purpose / Problem / Goal / Objective Statement</b></p>	No statement is provided	Addresses an issue which is unrelated to research. Statement located as a separate section just after introduction	Addresses an issue somewhat related to research. Located as a separate section just after introduction	Addresses a real issue directly related to research findings. Located as a separate section just after introduction	
<p><b>Methods:</b> Describe how the study was conducted; written in the past tense</p>	Not sequential, most steps are missing or are confusing.	Some of the steps are understandable; most are confusing and lack detail. Written as a list of instructions	Most of the steps are understandable; some lack detail or are confusing. Lacked modifications or did not refer to original procedure.	Presents easy-to-follow methods for different part of the laboratory which are logical and adequately detailed; entire procedure not normally written out, but refer to handout or source, unless some modification to the procedure was made, in which the changes should be described	
<p><b>Results:</b> Presentation of your data, written in past tense</p>	No results are reported	Both incomplete, minor inaccuracies and/or illegible characters. Results not reported in the same order as the methods were written; details of report finding written first, major findings second; Reference to a table or a figure, was simple reinstatement of data in the figure or table;	Both accurate, some ill-formed characters; Results may or may not be reported in the same order as the methods were written; mixing of major findings and details for each categories; Reference to a table or a figure, was simple reinstatement of data in the figure or table;	Condense and clear report of the data and answering of questions. Results are reported in the same order as the methods were written; major findings written first for each category, followed more detailed information; When referring to a table or a figure, write about the pattern of the data via ranges and average values;	

<p><b>Discussion:</b> Your interpretation of the results Significance of the results and sources of error</p>	Presents an illogical explanation for findings and does not address any of the questions suggested in the handout.	Presents an illogical explanation for findings and addresses few questions.	Presents a logical explanation for findings and addresses some of the questions. Consists of a paragraph of a few sentences	Presents a logical explanation for findings and addresses most of the questions; explanation of any sources of error. Consists of several paragraphs of several to a few sentences per paragraph	
<p><b>References:</b> See following pages for examples</p>	No references listed	Some references listed; or not properly formatted	All references listed, but not properly formatted; or not all references listed, but were properly formatted	All references listed and properly formatted	
<p><b>Figures:</b> Have a horizontal (bottom) and vertical (left) axis; Figure legend listed <i>below</i> the figure; symbols and units present in axes labels; see following pages for examples</p>	No figure legend(s); No horizontal lines breaking the header from the data and or multiple vertical lines present	Figure legend(s) only consists of the word "Figure" plus what ever number it is. (e.g. Figure 1) without a description. Figure legend(s) may be on the top or the bottom of figure	Figure legend(s) is/are presented at the bottom of the figure. Figure legend(s) include(s) the number (e.g. Fig. 1), but does not accurately describe the figure; or does not include the figure number; or is placed above the figure itself	Figure legend(s) accurately describe(s) the figure(s) and provide enough information to stand alone without referring back to the text; are located below the figure itself. Figure legend(s) are listed below the figure.	
<p><b>Tables:</b> Table legend (i.e. title) located above the table itself and should be self explanatory of the information contained in the table. Has 5 main points: 1) the number and title; 2) the vertical heading(s) (column) called boxhead; 3) the horizontal headings (row headings) called the stub; 4) the fields that have the data; 5) 3 horizontal lines across the table with 1 placed below table legend (title), 1 below the boxhead; and 1 at the bottom of the table; See example</p>	No table legend; No horizontal lines breaking the header from the data and or multiple vertical lines present	Table legend only consists of the word "Table" plus what ever number it is. (E.g. Table 1) without and description. Table legend may be on the top or the bottom of Table	Table legend is presented at the top of the table. Table legend includes the number (e.g. Table 1), but does not accurately describe the table; or does not include the table number; or is placed below the table itself	Table legends (titles) has table number and accurately describes the table and provide enough information to stand alone without referring back to the text; are located above the figure itself. Tables are have only 3 horizontal lines, 1 below the title, one below the boxhead, and one below the last data row	
<b>ACCURACY</b>	<b>Unsatisfactory</b> <b>0</b>	<b>Borderline</b> <b>.5</b>	<b>Satisfactory</b> <b>1</b>	<b>Exemplary</b> <b>1.5</b>	<b>Score</b>
<p><b>Units/Data Manipulation:</b></p>	Units are rarely used or are generally incorrect. Dimensional analysis not used. Math not shown. Figures display data incorrectly.	Units used only in some key parts of report Calculations contain some errors in dimensional analysis or math. Figures correct. No labels or legend	Units generally used correctly in most of report. Calculations contain few errors in dimensional analysis or math. Figures correct, variables unlabeled.	Units are used correctly and consistently throughout the report. Calculations clearly laid out. Dimensional analysis/Math correct. Figures display data correctly, all variables labeled.	
<b>ORGANIZATION AND WRITING STYLE</b>	<b>Unsatisfactory</b> <b>0</b>	<b>Borderline</b> <b>1.25</b>	<b>Satisfactory</b> <b>2.5</b>	<b>Exemplary</b> <b>4</b>	<b>Score</b>
<p><b>Organization:</b> Title page, Introduction, Statement of Problem, Methods, Results, Discussion, References, Tables, Figures</p>	More than 2 categories missing or out of sequence.	Not more than 2 categories missing or out of sequence.	Not more than one category missing or out of sequence.	Proper order/sequence as listed	
<p><b>Grammar &amp; Spelling</b></p>	Very frequent grammar and/or spelling errors.	More than two errors.	Only one or two errors.	All grammar and spelling are correct.	
				<b>Total (out of 50)</b>	

## WHAT IS A RUBRIC?

Scientific Report Rubric *Rubric* — a set of guidelines for assessment which states the characteristics and/or dimensions being assessed with clear performance criteria and a rating scale.

A scoring rubric consists of: a fixed scale, a list of characteristics describing performance for each of the points on a scale, and clear performance targets for students

How to Design a Rubric 1) Choose a product or demonstration based on a specific outcome(s) that you wish to assess, then describe a superior performance / demonstration. 2) Describe a limited performance/demonstration. 3) Describe different levels of performance expectations between the above two levels. 4) Encourage student input into the performance standards. 5) Provide exemplars to ensure students understand the standards.

Creating Effective Rubrics Outcomes participants will: 1) **Knowledge:** demonstrate an understanding of the need for a wide variety of assessment and evaluation tools and effective scoring sheets (rubrics). 2) **Skills:** become more skilled in developing clear criteria that will form the basis for appropriate assessment tools and scoring sheets; reflect on the ideas provided and determine how they could be implemented in the school. 3) **Values:** identify that the main purpose of assessment and evaluation is to provide information for teachers and students to improve learning; acknowledge students as partners in the assessment process; recognize that being a reflective and collaborative practitioner helps one to continue to improve one's assessment and evaluation practices.

### **CITATIONS AND REFERENCES:**

#### INTEXT CITATIONS:

When there is more than one citation for a particular statement, list them (1) chronologically, beginning with the oldest (with “in press” and “unpublished” sources at the end), and then (2) alphabetically within years (with citations containing “and” and “et al.” in alphabetical order):

(Roberts 1985; Johnson 1987; Berger, in press)  
(Eldridge 1989; Smith 1992; Smith and Thomas 1992)

*Exception:* Group publications by the same author or authors together, even if this violates the rule about chronological listing:

(Roberts 1992, 1997; Smith 1996)

#### REFERENCE LISTS:

References should be listed (1) alphabetically by authors’ last names (ignoring the word “and”) and then (2) chronologically, with items that are in press coming last.

Smith, R. C. 1992. Spawning patterns in. . . .  
Smith, R. C., J. B. Oldham, and W. F. Stone. 1998. Determinants of. . . .  
Smith, R. C., and H. Thompson. 1995. Observations on. . . .  
Smith, R. C., and H. Thompson. 1997. Additional observations on. . . .

#### Journals:

Hochachka, P. W. 1990. Scope for survival: a conceptual “mirror” to Fry’s scope for activity. *Transactions of the American Fisheries Society* 119:622-628.  
Kennedy, V. S. 1990. Anticipated effects of climate change on estuarine and coastal fisheries. *Fisheries* 15(6):16-24.

#### Books:

Brönmark, C., and L.-A. Hansson. 1998. *The biology of lakes and ponds*. Oxford University Press, New York.  
Murphy, B. R., and D. W. Willis, editors. 1996. *Fisheries techniques*, 2nd edition. American Fisheries Society, Bethesda, Maryland.  
G. E. Hutchinson. 1975. *A treatise on limnology*, volume 1, part 1. *Geography and physics of lakes*. Wiley, New York.

### Reports:

USEPA (U.S. Environmental Protection Agency). 1986. Quality criteria for water. USEPA, Report 440/5-86-001, Washington, D.C.  
May, B., and R. Zubik. 1985. Quantitative. . . . Annual Report to the Bonneville Power Administration, Project 83-465, Portland, Oregon.

### Magazines and Newspapers:

Tucker, J. W., Jr. 1985. Sheepshead. . . . Tropical Fish Hobbyist (January):64-65, 68.  
Larsen, R. 1986. Forestry and fisheries. The Seattle Times (February 9):A21, 27.  
Saving the ocean. 2003. The Washington Post (May 21):A30.

### Theses and Dissertations:

Chitwood, J. B. 1976. The effects of threadfin shad as a forage species for largemouth bass in combination with bluegill, redear, and other forage species. Master's thesis. Auburn University, Auburn, Alabama.  
Hartman, K. J. 1993. Striped bass, bluefish, and weakfish in the Chesapeake Bay: energetics, trophic linkages, and bioenergetics model applications. Doctoral dissertation. University of Maryland, College Park.

### Web Sites:

Baldwin, N. A., R. W. Saalfield, M. R. Dochoda, H. J. Buettner, and R. L. Eschenroder. 2000. Commercial fish production in the Great Lakes, 1867-1996. Great Lakes Fishery Commission. Available: [www.glfrc.org/databases/commercial/commerc.asp](http://www.glfrc.org/databases/commercial/commerc.asp). (September 2000). (Note: The date in parentheses indicates when the site was accessed.)

### Software:

SPSS. 1993. SPSS for Windows, release 6.0. SPSS, Chicago.

**Tables:** The basic structure of a table includes only 3 horizontal lines (NO VERTICAL LINES, NOT A BOX). One of the 3 horizontal lines lies below your title, one lies below the column headings, and one lies below your last data row. Remember that the title (including the number) of the table is given ABOVE the table (NOT BELOW!) and briefly and concisely describes the table. Also make sure that your columns are headed correctly and that the units are indicated at the heading. Please look at the tables below as good examples of correctly constructed tables.

Table 3. Characteristics of four snail populations sampled at Nahant, MA on October 13, 1985.

Species	Average shell length (cm)	Sample size	Average no. animals per m <sup>2</sup>
<u>Crepidula</u>			
<u>forficata</u>	1.63	122 indiv.	32.1
<u>C. plana</u>	1.01	116	20.8
<u>Littorina</u>			
<u>littorea</u>	0.87	447	113.6
<u>L. saxatilis</u>	0.40	60	8.2

TABLE 6. Characteristics of antibiotic-producing *Streptomyces*

Determination	<i>S. fluoricolor</i>	<i>S. griseus</i>	<i>S. coelicolor</i>	<i>S. nocolor</i>
Optimal growth temp (°C)	-10	24	28	92
Color of mycelium	Tan	Gray	Red	Purple
Antibiotic produced	Fluorocillinmycin	Streptomycin	Rholmonde- lay <sup>a</sup>	Nomycin
Yield of antibiotic (mg/ml)	4,108	78	2	0

**Graphs:** All graphs are figures that consist of one horizontal and one vertical axis (not a box) in which each axis is labeled appropriately (including the units!). All figure captions are given BELOW THE FIGURE, including the figure number. Please note the graphs below. Note that they are simply constructed, but give the appropriate information needed to illustrate the results of the experiment.

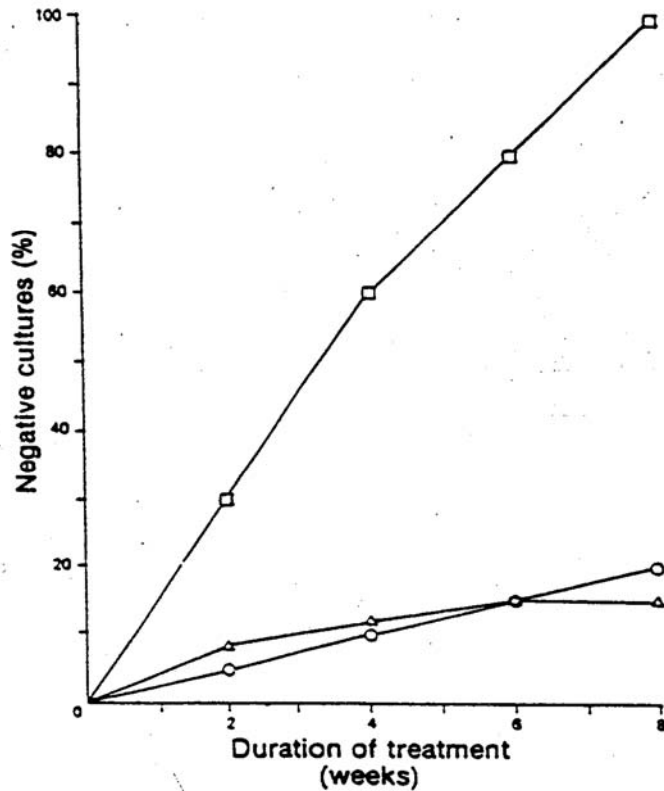


FIG. 2. Effect of streptomycin (O), isoniazid (Δ), and streptomycin plus isoniazid (□) on *Mycobacterium tuberculosis*. (Courtesy of Erwin F. Lessel.)

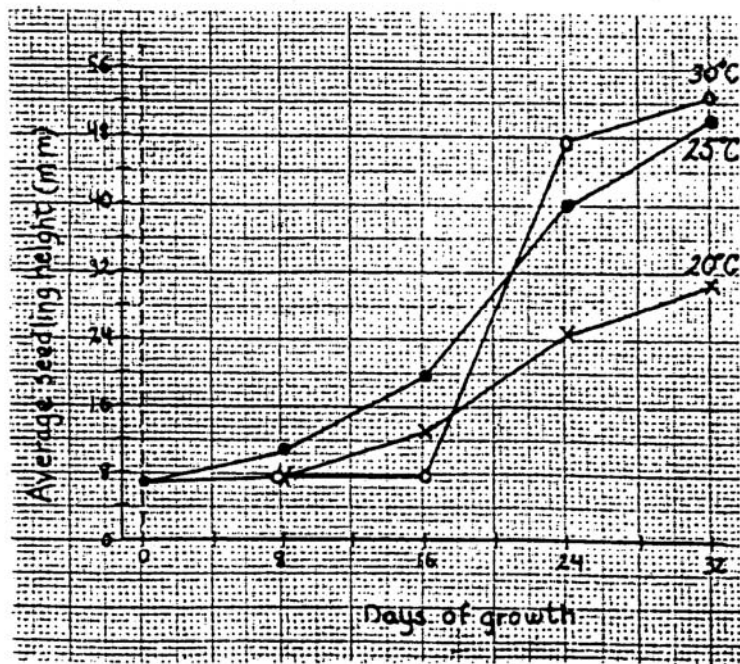


Figure 22. Rate of seedling growth at three different temperatures.