

Writing a Biology Review Paper

Presbyterian College Biology Department

Definition of a review paper

- A review is a comprehensive synthesis of results from a wide and complex set of studies
- A synthesis of *findings* rather than ideas.
- Goal of a review paper is to help readers make sense of all available information
- Direct quotations rarely found in reviews. Do Not Use!

Research reviews focus on primary sources

- Original scientific experimentation reported in scientific journals
- The quality of the review depends largely on the comprehensiveness of the literature search

Use of secondary sources--textbooks or review journals (*Science, Scientific American, Discover*)

- Overview of material--easier to understand.
- Use references for networking, authors
- Get keywords
- Help devise outline

Formatting the Paper

General Information

- 15-20 pages of text (not including figures and tables)
- Typed, double-spaced
- 12 point serif type fonts (Times, Times New Roman, Palatino)
- Margins 1.5" left, 1" top, 1" right, 1" bottom
- Indent each new paragraph 0.25"
- Must be in a bound folder with a transparent cover

Title Page

- Center title about 1/3 down the page in 18-point font. Capitalize the first letter of each word except for articles (a, an, the), conjunctions (and, but, for) and prepositions (in, on, to)

The Adaptations for Thermoregulation in Winter Moths

- Center your name 10 lines under the title in 12-point font
- Center the date of submission date a double space below your name in 12-point font

- Center the following phrase a triple space below the date: "a paper submitted to the faculty of the Department of Biology, Presbyterian College, in partial fulfillment of the requirements of Senior Seminar, Biology 401"

Pagination

- Number the pages consecutively, beginning with the title page, which does not have a page number but is still counted as the first page
- Use only arabic numbers (1, 2, 3, etc.)
- Put the page numbers in the upper right hand corner

Headings

- Use sparingly
- Make them informative and concise
- Center headings.
- Triple space before the heading and double space after the heading
- Use 12-point font, but bold

Using Numbers in Paper

- Spell out numbers less than 10
- Do not begin a sentence with a numeral, even if it larger than 10
- Always use numerals when reporting quantitative data with a unit: 15 km, 8 g, 5 mL (check McMillan pp. 155-157 for proper abbreviations)

Tables and Figures

- Must be incorporate/insert tables and figures in the text following the first text citation.
- Cite according to number: "----as shown in Figure 3." "----the relationships of the species (Table 2)."
- Each table and figure should be self-explanatory.
- Left justify all titles and legends (single-spaced).
- Put a period after the number of the figure or table in the title. Figure 1. Survivorship of *Xanthium strumarium* seed over a period of 100 days.
- Tables and figures should be cited according to number, "as shown in Figure 3," or "the relationships of the species (Table 2)."
- Make sure to reference figures in title, if taken from a source.
- Triple space before and after each table or figure.

Tables

- At least one in paper

- Make sure to know when to use and when not to use: Use to present many numerical data or to summarize verbal material from text. Do not use to show patterns or trends
- Reference table in preceding paragraph: Table 1 shows --- or ---- (Table1).
- Number tables consecutively throughout paper, even if there is only one
- Always horizontally centered
- How to set up
 - Title at top, left justified--Table 1. XXXXXXXXXXXXXXXX (Citation 2005).
 - Spanner line
 - Header
 - Subheader
 - Spanner
 - Data
 - Spanner
 - Notes

Figures

- Anything not a table is a figure
- At least one in paper
- Many different types.
 - Graphs: Line -- shows trends. Bar -- quantitative v/s qualitative
 - Illustrations
 - Diagrams
- Reference figure in preceding paragraph. Figure 1 illustrates --- or --- (Fig. 1)
- Number figures consecutively throughout, but separately from tables
- Always horizontally centered
- How to set up: Figure is on top. If it is a graph, make sure axes are labeled: independent variable on X-axis and dependent variable on Y-axis. If it is an illustration, include spanner lines
- Title at bottom, left justified - Figure 1. XXXXXXXXXXXXXXXX (Citation 2005).

Scientific Names

- Always italicized
- Genus capitalized, species not
- Abbreviate genus name after the first reference: *Quercus alba* becomes *Q. alba*
- Avoid using common names without scientific names. For example, "corn" is not the same thing in different parts of the world. Give the scientific name instead of or following the common name: The great white shark, *C. carcharias*, is commonly found---- or *C. carcharias* is commonly found----
- Do not use articles (*the, a, an*) with scientific names
- "Species" is a collective singular: There is no such word as *specie*. For example, "This species is specific to one locale."
- Genera names can be used alone if you are referring collectively (Some species of *Sargassum* grow----)

- Taxonomic levels above the genus level are capitalized but not italicized: the Chilopoda (centipedes), Animalia, Chordata, Osteichthyes
- Some taxa have been modified to become common names, which are not capitalized: lycosids from Lycopsida; dipterans from Diptera

Subscripts and Superscripts

- Use superscripts for degree measurements, ion charges, and mathematical expressions: 36°C, Ca⁺⁺ or Ca⁺², C⁺
- Use subscripts for chemical compounds: CaCl₂ Fe₂(SO₄)₃

Writing the Paper

Remember the basic outline for a review paper.

- Title Page
 - Title should be specific, informative, concise
 - See pages 89-90 in McMillan
- Abstract
 - Short, concise summary of paper (200-250 words)
 - No references
 - Center "**Abstract**" a double space before paragraph
- Introduction
 - Center "**Introduction**" above this section
 - Review the topic
 - Importance and significance.
 - Background information, conflicting views, major lines of thought
 - Statement of purpose
 - Document and reference sources
- Body of text (topic 1, topic 2, Topic 3)
 - Present details of work done by researchers on topic
 - Mention and describe important techniques, methods, results, and conclusions
 - May have headings, but don't use "**Body**"
 - Develop and follow good topic sentences
 - Coherent, well-blended summation of all the work you could find that is important to your subject
 - Develop a pathway of thought that leads to conclusions
 - Document and reference sources
- Conclusions
 - Consolidate ideas, strengthen relationships between ideas, patterns, tie up loose ends
 - Significance of topic
 - Make sure you conclude something
 - Do not introduce new data, results
 - What is next, future avenues of research
- Write the paper well in advance of the due date
 - Set it aside and reread it later.

- SAVE, SAVE, SAVE, SAVE (not only on disk, but on a hard drive somewhere)
- Computer malfunctions will not be accepted as an excuse for late work

Person

- Most scientific work is written in the third person, but is written in passive, past tense
- Avoid using pronouns
- Facts and ideas are stated about procedures and results. Comparative studies were performed ---- or ---- was observed over a period of two years.

Documentation

Use the Literature Cited method (all references cited in the text). No footnotes and Nno numbers (as in *Science*)

In Text: Cite using the Harvard System (Name-Year)

One author

The most recent study of this species (Jackson 1996) shows ----

---- demonstrated in the most recent study of this species (Jackson 1996).

Jackson's (1996) study fails to account for ----

In a recent study of this species by Jackson (1996) ----

Common Errors. Watch where periods go.

----(Jackson, 1996).

----. (Jackson 1996)

----(Jackson 1996.)

Correct --- (Jackson 1996).

Two authors

In a study of the spotted skunk (Smith and Jones 1991) ----

Smith and Jones (1991) reported that ----

More than two authors

In a study of the snowy egret (Brown *et al.* 1994) ----

Brown *et al.* (1994) reported that ----

Two papers from the same author in the same year (alphabetical by authors, then titles)

----(Johnson et al. 2004a)

----(Johnson et al. 2005b)

More than one reference, different authors (chronological, then alphabetical)
Several models have been proposed (Wright 1935, Abrams and Chen 1960, Diaz 1980).
Several models have been proposed (Jones 1985, Allen 1990, Stokes 1990, Diaz 2004).

No author is given

Creeping bellflower has been reported ---- (Anon. 1986).

Unpublished work

General Info: The yolk-sac placenta of the cat shark contains a capillary plexus along its inner surface (Wourms, personal communication).

Research in progress: This capillary plexus serves to exchange metabolites across the egg envelope (Wourms, unpublished).

Manuscripts not yet printed: The cotylephores of *Platystacus* contain approximately 28.5% greater surface area for exchange than is available in *Solenostomus* (Wetzel, in press).

Electronic Sources

Identifiable Author and Date: Still use name-date citation.

Identifiable author, but not Date: Use author's name and date the page was accessed.

No Identifiable Author: Use the root web address ----(www.cdc.gov).

References: Use the Harvard System (Name-Year). Put sources in alphabetical order by first author's last name. If you have more than one article by the same author, put the articles in chronological order with the earliest first.

Begin the first line of first entry at the left margin and then indent the rest of the reference 5 spaces (not shown in example below).

References

Centers for Disease Control - Division of Parasitic Diseases. 2003.
<http://www.cdc.gov/ncidod/dpd/default.htm>. Accessed 21 Feb 2006.

Kingsolver, J.C. and R.B. Srygley. 2000. Experimental analyses of body size, flight, and survival in pierid butterflies. *Evol. Ecol. Res.* {serial online}; 2:593-612.
<www.colgate.edu/biol>. Accessed 3 Oct 2000.

Linton, J.R. and B.L. Soloff. 1964. The physiology of the brood pouch of the male seahorse, *Hippocampus erectus*. *Bull. Mar. Sci* 14: 45-61.

Orr, J.W. and R.A. Fritzsche. 1993. Revision of the ghost pipefishes, family Solenostomidae (Teleostei: Syngnathodidei). *Copeia* 1993: 168-182.

Ruppert, E.R., Fox, R.S., and Barnes, R.D. 2004. *Invertebrate Zoology*. Belmont: Thomson. 963 p.

Journal articles: Author(s). Year of Publication. Title of Paper. Journal Title(no.)
Volume Number: Pages.

- Primary source with single author: Jones, B.J. 1994. Serotonin turnover in raphe neurons transplanted into rat hippocampus. *N Engl J. Med* 330:874-8.
- Two authors: Jones, B.J. and K.Y. Lee. 1994. Agonistic and reproductive behavior of african bees. *Nat Zool* 35:396-400.
- Multiple authors: Jones, B.J., Lee, K.Y., and Smith, N.D. 1994. Agonistic and reproductive behavior of african bees. *Nat Zool* 35:396-400.
- No author given: [Anonymous]. 1976. Epidemiology for primary health care. *Int J. Epidemiol* 5:224-5. Citation in text: (Anon. 1976)

Books: Author(s). Year. Title of book. Place of publication: Publisher. pages in book.

- Book: Voet, D., and J.G. Smith. 1990. *Biochemistry*. New York: J Wiley. 1223 p. Citation in text: (Voet and Smith 1990)
- Book with editors: Gilman, A.G., Rall, T.W., and Nies, A.S., editors. 1990. *The pharmacological basis of therapeutics*. 8th ed. New York: Pergamon. 1180 p. Citation in text: (Gilam et al. 1990)

Electronic Sources

Author/editor. Year. Title (edition). Publisher (if applicable). [Type of medium, i.e. CD-ROM or online], Volume: Paging or indicator of length. Internet Address. Accessed day month (abbreviate) year.

Example: Clark, J.K. 1994. Complications in academia: Sexual harassment and the law. [Online] 2:3 paragraphs. <http://www.cac.psu.edu/jeb/twocont.html> Accessed 21 June 1995.

If author is not available put [Anonymous]. Leave out what is not supplied.

Write (no date) when the electronic publication date is not available. Example:

[Anonymous] (no date). Transgenic potatoes as a source of vaccines. [Online] 6-10. <http://www.cac.texasam.edu/tebsu.html>. Accessed 2 Jan 1997.

Make an appointment for a writing conference in the Writing Center in Neville 206 to go over your paper with a tutor.