

Wartburg Biology Writing Style Guide

The Wartburg Biology Department faculty have chosen to adopt a style manual to establish a consistent writing format across all of your biology courses. You should use the style and format guidelines in this document for all of your writing in biology, unless your instructor specifically instructs you to use a different style. This document includes the most pertinent information from *Scientific Style and Format: The CSE Manual for Authors, Editors, and Publishers*, 7th ed. by the Council of Science Editors. If you have any questions that go beyond the scope of this document, you should refer to either *A Short Guide to Writing About Biology*, 6th ed. (or 7th ed.) by Jan A. Pechenik or *Scientific Style and Format*, which can be found in the reference section at Vogel Library.

Section 1: Numbers and Units

Whole Numbers

Modern scientific number style generally favors the use of numerals (3, 29) when discussing whole-number quantities as opposed to writing out the words (three, twenty-nine). Numerals are also used to indicate mathematical relationships (3:1 ratio, 100x magnification). There are four types of exceptions to this general rule:

1) If the number is the first word in the sentence, use the word, not the numeral.

Example: Ten adult females were selected for the study.

(not 10 adult females were selected for the study.)

2) If two numbers are adjacent in the sentence, one of them should be written as a word, and one as a numeral. If one of the number represents a measurement amount, that number should be written as a numeral.

Example: Five 1 mL aliquots were dispensed.

We measured twenty 30 g samples.

3) Spell out the words for the numbers zero and one *unless* they indicate a measured or calculated value. Values which meet this exception will generally have units associated with them.

Examples: In each trial, one mouse was used as a control.

The zero value for the spectrophotometer was obtained using a blank.

The mean growth for plants in the treatment group was 0 mm.

All samples were treated for 1 hour.

4) A number that is a part of a figure of speech should be written as a word. Generally, you should avoid figures of speech in scientific writing, so you should not use this exception often.

Examples: Three strikes and you're out.

This tells us a thing or two about...

Ordinal Numbers

Ordinal numbers designate rank, such as first place, the second experiment, or the third phase. For single-digit ordinals, write out the word (first-ninth). For greater ordinals, use the numeric representation (13th, 31st). If your text includes multiple ordinals in one sentence, use the numerals, even if the ordinals are single digits.

Example: The 3rd, 5th, and 6th samples deviated from the other samples.

Decimals

When a decimal value is less than 1, a leading zero should be added to the value.

Example: 0.75 (not .75)

Fractions

Spell out the fraction in text, hyphenating 2-word fractions. Decimals should be used to indicate exact measurements.

Examples: one-half of the mice were treated
a quarter of the subjects
1.5 g of sucrose were added (not 1½ g. of sucrose)

Units

Use SI units and their proper abbreviations in scientific writing. A list of commonly used units is below, but for a complete list of SI units, see *Scientific Style and Format: The CSE Manual for Authors, Editors, and Publishers*, 7th ed. by the Council of Science Editors. When using units in a sentence, you should state the numeral, include a space, then the appropriate unit. You do not need to add a period after an SI abbreviation and you do not add an “s” to SI units to indicate plurality.

Examples: The trial was completed in 53 s.
4 mL of buffer was added.

Common SI units

Length	meter	m
Mass	kilogram	kg
Volume	liter	L
Time	second	s
	minute	min
	hour	h
Temperature	degree Celsius	°C

The SI units can be modified by prefixes from the metric system indicated below. The one-letter abbreviation in parentheses should be used as a prefix to the SI unit with no space in between the prefix and the SI unit.

SI Unit Prefixes

Tera (T)	10^{12}	Deci (d)	10^{-1}
Giga (G)	10^9	Centi (c)	10^{-2}
Mega (M)	10^6	Milli (m)	10^{-3}
Kilo (K)	10^3	Micro (μ)	10^{-6}
		Nano (n)	10^{-9}
		Pico (p)	10^{-12}

Examples: 2.3 mL
5 cm

Section 2: References

In-Text Citations

Any statement of facts or opinions (other than your own) must be supported by either data (figures/tables/graphs) or references within the text of your document. The in-text citation is placed immediately following the word or phrase to which it is relevant. The full end citations for the examples in this section are included in the Literature Cited section of this document.

Example:

A recent study (Donlea et al. 2009) demonstrated three genes in *Drosophila* regulate increased sleep need after memory-inducing events.

The Wartburg Biology Department has chosen to use the **name-year system** of in-text citations, which means a citation consists of at least one author's last name and the year of publication in parentheses. The author's name may be omitted from the citation if the author's name was previously stated in the sentence that contains the citation.

Example:

Gilbert's list of key principles in animal development (2008) includes timing and location as determinants of cell fate.

Some situations require additional information in the citation, and examples of these are found below.

Multiple Authors

With 2 authors, the in-text citation should include both authors' last names and the date of publication. With 3 or more authors, the in-text citation should include the first author's last name, the Latin abbreviation et al. (and others), and then the date of publication.

Two authors:

Microorganisms capable of degrading *Olestra* were identified in multiple environments (Lee and Ventullo 1996).

Three or more authors:

One previous study of cytochrome c in *Phanerochaete* (Bumpus et al. 2007) indicated...

Multiple works by the same author

If the two works are published in different years, they can be distinguished by the dates. If both the works are cited in the same in-text citation, you only need to include the author's name followed by both dates. If the two works were published in the same year, they can be distinguished by adding an alphabetic designation (a for the first work of the year, b for the second work of the year, etc.) after the year.

Two works in different years:

Foster described the effects of ant mounds in virgin and disturbed prairies (2006), and later went on to describe small virgin prairie ecosystem (Foster et al. 2008).

Two works in the same year:

Previous work (Mitra et al. 2004a, 2004b) has described the transcriptional regulation of nodule formation in legumes.

Authors with identical last names

If two works have authors with identical last names, the first and middle initials of the authors should be added to the in-text citation to distinguish the references.

A review of Prohibitin function (McClung JK 1995)...

This study (McClung JM 2005) indicates anabolic steroids affect cell cycle progression in muscle cells.

Organizations as authors

You may have sources that are written by an institution or organization. To cite these, use the institution or organization in place of the author name in the citation. If the organization has a long name, you may abbreviate it by using the first letter of each of the words in the name. For example, Environmental Protection Agency can be abbreviated EPA. The end reference should start with the abbreviation used in the in-text reference in square brackets, followed by the full name of the organization. See the Literature Cited section for an example of this.

No H1N1 cross-reactive antibodies appear to be present in children vaccinated with the seasonal flu vaccines from the previous 3 years (CDC 2009).

Unidentified authors

If you cannot identify an author of your source, think about whether the source you are using is appropriate. This should be quite rare in scientific writing. Use the first word of the title in place of the author name, and follow it with an ellipsis. Here's an example from *Scientific Style and Format*:

"Drug dosage recommendations for elderly patients (Handbook...c2000) depart from..."

Multiple citations at the same point in the text

If multiple works are cited at the same point, the citations should be ordered chronologically (earliest to most recent) and alphabetically by author within the same year. Within the parentheses, individual citations are separated by semi-colons.

Example:

Recent publications in the department (Foster 2006; Bumpus et al. 2007; Foster et al. 2008) include works on prairies and microbial gene sequences.

Literature Cited

The Literature Cited section of your lab report or paper must include the reference information for all of the sources you cited in the text of your paper. The purpose of the Literature Cited section is to provide the information necessary to locate the document you cited, so interested readers can find your sources. This information varies with the type of source as indicated in the examples below. If you have other sources you read, but did not directly cite in your paper, they DO NOT belong in the Literature Cited section. In some cases (but not usually), you may have an additional section titled "Additional References" that includes sources you read, but did not directly cite.

The citations in the Literature Cited section are listed alphabetically based on the first author's last name. There is a sample literature cited section at the end of this section.

Formatting of Citations

Pay attention to punctuation and spacing!

Journal Articles

General format: Author(s). Date. Article Title. Journal Title. Volume(Issue):page numbers.

Journal titles may be abbreviated according to the International Organization for Standardization (ISO) standards. Lists of journal abbreviations can be found online on MEDLINE and in other sources listed in *Scientific Style and Format: The CSE Manual for Authors, Editors, and Publishers*, 7th ed. by the Council of Science Editors.

Examples:

Bumpus JA, Trax M, Reisdorph A, Boyd C, Gilbert D, Techau S, Ventullo RM. 2007. An *in silico* analysis of cytochrome c from *Phanerochaete chrysosporium*: its amino acid sequence and characterization of gene structural elements. *In Silico Biology*. 8, 0001.

[CDC] Centers for Disease Control and Prevention. 2009. Serum cross-reactive antibody response to a novel influenza A (H1N1) virus after vaccination with seasonal influenza vaccine. *MMWR Weekly*. 58(19):521-524.

Donlea JM, Ramanan N, Shaw PJ. 2009. Use-dependent plasticity in clock neurons regulates sleep need in *Drosophila*. *Science*. 324(5923):105-108.

Gilbert SF. 2008. All I really needed to know I learned during gastrulation. *CBE Life Sci. Educ.* 7:28-29.

Lee DM, Ventullo RM. 1996. Degradation of *Olestra*, a non caloric fat substitute, by microorganisms from activated sludge and other environments. *Biodegradation.* 12:1-9.

McClung JK, Jupe ER, Liu XT, Dell'Orco RT. 1995. Prohibitin: potential role in senescence, development, and tumor suppression. *Exp Gerontol.* 30(2):99-124. Review.

McClung JM, Mehl KA, Thompson RW, Lowe LL, Carson JA. 2005. Nandrolone decanoate modulates cell cycle regulation in functionally overloaded rat soleus muscle. *Am J Physiol Regul Integr Comp Physiol.* 288(6):R1543-52.

Mitra RM, Gleason CA, Edwards A, Hadfield J, Downie JA, Oldroyd GE, Long SR. 2004a. A Ca²⁺/calmodulin-dependent protein kinase required for symbiotic nodule development: Gene identification by transcript-based cloning. *Proc Natl Acad Sci USA.* 101(13):4701-5. Epub 2004 Mar 1.

Mitra RM, Shaw SL, Long SR. 2004b. Six nonnodulating plant mutants defective for Nod factor-induced transcriptional changes associated with the legume-rhizobia symbiosis. *Proc Natl Acad Sci USA.* 101(27):10217-22. Epub 2004 Jun 25.

Books

The general format for a book citation is as follows:

Author(s). Date. Title. Edition. Place of Publication: publisher. Extent. Notes.

If you have only read part of the book, indicate the page numbers in the "Extent" part of the citation; if you read the whole book, you do not need to include page numbers. If the part of the book you read is written by a different author than the main author/editors, use the following format:

Author(s) of section. Title of section. In: Author(s) or editor(s). Date. Book title. Edition. Place of Publication: publisher. Extent. Notes.

Examples:

Campbell NA, Reece JB. 2007. *Biology.* 8th edition. New York (NY): Benjamin Cummings.

Gilbert SF. 2006. *Developmental Biology.* 8th edition. Sunderland (MA): Sinauer Associates, Inc. 606-623.

Handbook of geriatric drug therapy. c2000. Springhouse (PA): Springhouse. **Note: this is a book without identifiable authors!**

Conference Papers

Conference papers essentially have the same format as books, though the citation needs to include the date and location of the conference.

Author(s). Date. Title of paper. In: Editor(s). Title of book. Number and name of conference; date of conference; place of conference. Place of publication: publisher. Extent. Notes.

Examples:

Foster J, Trager J, Freese E. 2008. A small gem in Iowa. In: Proceedings of the 21st North American Prairie Conference. 21st North American Prairie Conference; 2008 Aug 4-8; Winona, MN. Winona, MN: Winona State University. Accepted, in revision.

Foster J. 2006. Ant-mound effects on two adjacent prairies: virgin and plowed. In: Eagan D and Harrington JA, eds. Proceedings of the 19th North American Prairie Conference. 19th North American Prairie Conference; 2004 Aug. 8-12; Madison, WI. Madison, WI: University of Wisconsin-Madison. 81-85.

Newspapers

The format for a newspaper citation is very similar to a journal citation. There are 3 differences between the two formats. First, newspaper names are NOT abbreviated the way journal titles are. Second, the section information for the article is used instead of the volume and issue information found in a journal citation. Third, the column location is given at the end of the citation.

General format: Author(s). Date. Article Title. Title of Newspaper (edition). Section: beginning page of article (column no.).

Example:

Belluck P. 2009 Sept 6. Tick-Borne illnesses have Nantucket considering some deer-based solutions. The New York Times (national edition). Sec. A:14 (col. 1).

Audiovisuals and Electronic Media (non-internet)

The format for audiovisual materials (videocassettes, audiocassettes, motion pictures, slides) and for electronic media (CD-ROMs, DVDs) is identical to that of books except that the medium is designated in square brackets following the title. Additionally, notes on the physical description of the item and the system compatibility may be added at the end of the citation. See *Scientific Style and Format* for examples of these types of notes.

General format: Author(s). Date. Title [medium]. Edition. Place of Publication: publisher. Physical description. Notes.

Example:

[SDB] Society for Developmental Biology. 1991. A dozen eggs [videorecording]. Fink R, editor. Sunderland (MA): Sinauer Associates, Inc.

Internet Material

The information required for an internet citation is essentially identical to other sources such as books. However, it may be difficult to identify authors or a date of publication. Do not make assumptions about authorship; if an author name is not clearly stated, use the title of the web page instead of an author name (see Unidentified Authors above). For the date, you should include the most recent update date (often found at the bottom of a web page) AND the date when you found the information there. Since you never know when a web page will be taken down or changed, you should print out a copy of any important pages you reference. All internet citations should include the URL of the web page in the notes section of the citation. When you do this, be sure to disable the “Automatically create hyperlinks” feature in Word, as it will change the formatting of your citation.

You will often locate journal articles on the internet. If you download a PDF version of a journal article, you should cite it as a journal article, and you do not need to include any internet information. If you read the html version of that same journal article (you do NOT download the PDF), then you need to include the internet information in the citation.

General format for homepages:

Title of homepage [internet]. Date of publication. Edition. Place of Publication: publisher; [date updated; date cited]. Notes.

General format for databases:

Title of Database [internet]. Beginning date-ending date. Edition. Place of Publication: publisher. [date update; date cited]. Notes.

General format for journal articles on the internet (citation of the html version):

Author(s). Date. Article Title. Journal Title [internet]. [date updated; date cited]; Volume(Issue):page numbers. Notes.

Examples:

CDC 2009 H1N1 Flu [internet]. 2009. Atlanta (GA): Centers for Disease Control and Prevention; [updated 2009 Sept 8, cited 2009 Sept 9]. <http://www.cdc.gov/h1n1flu/>.

Flybase [internet]. 2003- . Release FB2009_07. Bloomington (IN): Indiana University. [updated 2009 Aug 10, cited 2009 Sept 9]. <http://flybase.bio.indiana.edu/>.

Toering SJ, Jarvis LA, Simon MA, Krasnow MA, Smith-Bolton RK. 2006. Sprouty proteins are in vivo targets of Corkscrew/SHP-2 tyrosine phosphatases. *Development* [internet]. [updated 2006 Feb 15, cited 2009 Sept 9]; 133: 1133-1142. <http://dev.biologists.org/cgi/content/full/133/6/1133>.

Literature Cited (Example)

Belluck P. 2009 Sept 6. Tick-Borne illnesses have Nantucket considering some deer-based solutions. The New York Times (national edition). Sec. A:14 (col. 1).

Foster J. 2006. Ant-mound effects on two adjacent prairies: virgin and plowed. In: Eagan D and Harrington JA, eds. Proceedings of the 19th North American Prairie Conference. 19th North American Prairie Conference; 2004 Aug. 8-12; Madison, WI. Madison, WI: University of Wisconsin-Madison. 81-85.

Gilbert SF. 2008. All I really needed to know I learned during gastrulation. CBE Life Sci. Educ. 7:28-29.

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McClung JK, Jupe ER, Liu XT, Dell'Orco RT. 1995. Prohibitin: potential role in senescence, development, and tumor suppression. Exp Gerontol. 30(2):99-124. Review.

[SDB] Society for Developmental Biology. 1991. A dozen eggs [videorecording]. Fink R, editor. Sunderland (MA): Sinauer Associates, Inc.

Toering SJ, Jarvis LA, Simon MA, Krasnow MA, Smith-Bolton RK. 2006. Sprouty proteins are in vivo targets of Corkscrew/SHP-2 tyrosine phosphatases. Development [internet]. [updated 2006 Feb 15, cited 2009 Sept 9]; 133: 1133-1142.
<http://dev.biologists.org/cgi/content/full/133/6/1133>.

Note: There are no indentations in the citations, and citations are single-spaced with a single return between citations.