

## General Tips for Writing in Biology and other Sciences

### Abbreviations and Symbols

- Some abbreviations and symbols are so commonly used and have become so standardized that they are universally understood within the scientific community. Examples include units of measurement in the international system.
- Except for those very commonly understood and widely used abbreviations and symbols, it is a good idea to type out the entire phrase or word and then to list the abbreviation that will be used from that point forward in the paper. If you are not sure that an abbreviation is “common” or “widely used” establish its meaning the first time it is used.
- Remember that the temperature scale known as Kelvin does not utilize a “degrees sign” (°) nor even use the word “degrees.”

### Examples

- The plants were watered with 125 mL of water every two days.
- The cells averaged less than 14  $\mu\text{m}$  in length.
- The World Health Organization (WHO) claims that the disease is most common in environments where temperatures exceed 30  $^{\circ}\text{C}$  for ca. 125 days each year. Executives at the WHO are trying to educate citizens from these regions.

The table below lists some terms that are often abbreviated in scientific writing.

Term	Abbreviation(s) and/or Symbol(s)
And	&
Approximately	ca. (meaning circa) ~
Approximately equal to	$\approx$
Change	$\Delta$
Circa	ca.
Copyright	© note: this symbol may be made on the keyboard by typing ( then C then )

Cubic centimeter	cm <sup>3</sup> cc
Decrease	↓
Directions (North, South, East, West)	N, S, E, W
Female	♀
Figure (when referring to a photo, diagram, table, etc)	Fig.
Figures	Figs.
Increase	↑
Male	♂
Not equivalent or not equal	≠
Null	∅
Number (a symbol meaning number)	#
Number (when referring to sample size)	n
Percent	%
Plus or minus	±
Trade mark	TM (usually written as a superscript)

### Scientific Names

- In all cases, biological writing should refer to an organism by its scientific name. Use of common or vernacular names may help to add interest to the writing but the scientific name is the standard. A few specialized fields of biology recognize official common names. This is particularly true among bird biologists.
- A scientific name should be underlined or italicized. The genus should be capitalized and the species name should be written in all lower case letters. A few scientific names have a third component known as the subspecies, race or variety. It is also written in lower case letters.
- If you have already written out the name of a genus, it may be abbreviated from that point forward in the paper. An exception to this rule of thumb should be made if two or more genera beginning with the same letter of the alphabet are being discussed.
- In some sub-disciplines of biology other taxonomic names, such as phyla, may also be italicized.

## Examples

- Fungi commonly known as baker's yeast or brewer's yeast are widely used in the brewing industry. In particular, *Saccharomyces cerevisiae* is of note. Another species, *S. carlsbergensis* is used less frequently.
- Lions, *Panthera leo*, are mostly associated with the continent of Africa. A subspecies, *P. leo persica*, may be found on the continent of Asia. Fossil evidence for an extinct American subspecies, *P. leo atrox*, is well documented.

## Numbers

- Any time a sentence begins with a number, spell it out.
- In general, any scientifically measured quantity should be written numerically.
- For non measured items, spell out numbers from zero to nine. For those higher than 10, use numerals.
- Under most circumstances, when discussing measured quantities or numbers derived from them, do not use more decimal places than your measuring device is accurate for. As an example, if you can estimate a half mL on a graduated cylinder you should only report average volumes to one decimal place: 26.5 mL; not 26.4789 mL.

## Other Examples

- To insure accuracy, five people measured the lengths of the organisms. A mean length of 5.1 cm was calculated.
- On three separate occasions, 300 people were surveyed. Only 3% of the surveys were returned for all three mailings.
- Twenty five specimens were examined. It was determined that 25% met the criterion.

## Singular & Plural Forms

Some terms in biology may prove problematic in terms of plural forms. The table below lists some terms that are often pluralized incorrectly.

<b>Singular Term</b>	<b>Correct Plural for Term</b>
Alga	Algae
Analysis	Analyses
Aorta	Aortae
Atrium	Atria
Bacterium	Bacteria
Bronchus	Bronchi
Chiasma	Chiasmata
Cilium	Cilia
Concha	Conchae
Crista	Cristae
Datum (rarely used)	Data
Endoplasmic reticulum	Endoplasmic reticula
Family	Families (not familys or family's)
Femur	Femora
Fish	Fish (if all the same type or species); Fishes (if more than one type or species)
Flagellum	Flagella
Foramen	Foramina
Fungus	Fungi
Ganglion	Ganglia
Genus	Genera
Glomerulus	Glomeruli
Gyrus	Gyri
Hypha	Hyphae
Hypothesis	Hypotheses
Labium	Labia
Larva	Larvae
Locus	Loci
Meninx	Meninges
Mitochondrion	Mitochondria
Mucosa	Mucosae
Mycelium	Mycelia
Nucleolus	Nucleoli
Nucleus	Nuclei
Oogonium	Oogonia
Ovum	Ova

Patella	Patellae
Phalanx	Phalanges
Phylum	Phyla
Pupa	Pupae
Septum	Septa
Species (not specie)	Species (both singular & plural)
Stoma	Stomata
Sulcus	Sulci
Taxon	Taxa
Testis	Testes
Tibia	Tibiae
Trachea	Tracheae
Vertebra	Vertebrae
Villus	Villi