

## **GENERAL GUIDELINES**

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## **SOME REFERENCE AND FORMAT GUIDELINES TO ASSIST STUDENTS AND FACULTY WITH THE PREPARATION OF THESES, DISSERTATIONS, REPORTS, PROPOSALS AND MANUSCRIPTS**

The following four guideline summaries are provided for your convenience to assist you with the preparation of theses, dissertations, reports, proposals and manuscripts. If you encounter any doubts or conflicts, or require more detailed or specific information, consult your copy of the Dissertation Manual and the CSE Manual.

1.

**Guidelines to using the CSE-NY reference format (2010).** This information is derived from information provided by Taylor and Francis to its book authors using the CSE N-Y format. These are summaries of rules in the CSE Manual. If you encounter any doubts or conflicts, or require more detailed or specific information, consult your copy of the Dissertation Manual and the CSE Manual.

2.

**Ecological Society of America (ESA) Guidelines for Statistical Analysis and Data Presentation (from the ESA 2010 web site).** These are mostly CSE compatible guidelines well. If you encounter any doubts or conflicts, or require more detailed or specific information, consult your copy of the Dissertation Manual and the CSE Manual.

3.

**Guidelines to ASTM units and abbreviations, as provided by the Ecological Society of America (from the ESA 2010 web site).** These are mostly CSE and ISO standards as well. If you encounter any doubts or conflicts, or require more detailed or specific information, consult your copy of the Dissertation Manual and the CSE Manual.

4.

**Some alternate characters and symbols on your computer keyboard.**

Thanks to Dr Eddie Laboy (Taylor and Francis) and Dr Elvira Cuevas (ESA) for making me aware of the original documents from which these summaries have been compiled.

**Guide to Citations and References using the Council of Science Editors Name-Year (CSE N-Y) Format** (based on information provided by Taylor and Francis to book authors using the CSE N-Y format)

The reference style of your manuscript should comply with the Council for Science Editors name-year rules format (CSE Chapter 29 and elsewhere). The following examples provide guidelines to the most common situations.

**IN TEXT CITATIONS**

**Rule 1:** Citations precede the final punctuation of the sentence that contains the reference. The basic elements of the in-text citation are the author's last name and the year of publication of the work. A space separates the name and the year. DO NOT WRITE a comma after the last name.

Example: The discussion of this phenomenon still influences scientists today (Einstein 1931).

**Rule 2:** If the last name of the author or authors appears in the sentence, only the year of publication need be included in parentheses. Example: Einstein provides a lengthy description of this phenomenon (1931).

**Rule 3:** If a work has two authors, provide the names of both authors separated by the word "and." DO NOT WRITE the symbol "&".

Example: Evidence of this phenomenon has been demonstrated in agrarian regions in India (Singh and Sharma 2004).

**Rule 4:** If a work has three or more authors, only provide the last name of the first author followed by "et al." If the first author has two last names (the case for Hispanics), separate those name with a hyphen.

Examples:

Smith et al. (2003) reported the abnormal behavior of ...

Logic systems displaying this behavior have been shown to allow abductive reasoning (Reyes-Cabello et al. 2005).

**Rule 5:** If your chapter cites two works from the same year with authors who have the same last name, distinguish between the authors by providing the authors' initials in the citation. Note that no commas or periods are used; initials are not separated by a space.

Example: (Wiles NM 2007) or (Wiles KB 2007)

**Rule 6:** If your chapter cites two or more works from the same author in the same year, distinguish the works by appending a lower case letter to the year in your citation. The paper published earliest in the year should be labeled "a," the next "b," etc. The publication dates for the citations in the works-cited page should be modified in the same way.

Example: (Andrews 1960a), (Andrews 1960b)

**Rule 7:** If a work has a corporation or government body as an author, use the initials of the organization's name to create a shortened form of the name. If the organization's name has a familiar abbreviated form, that form may be used as the shortened version. In your works-cited page, precede the matching citation with the initials used to refer to that organization, enclosed in square brackets.

Examples: In-text citation: (IOM 1975).

Reference: [IOM] Institute of Medicine (US). 1975. Legalized abortion and the public health; report of a study by a committee of the Institute of Medicine. Washington (DC): National Academy of Sciences.

**Rule 8:** In the Name-Year system it is permissible to refer to multiple works in the same citation. For multiple works by different authors, order the references chronologically ascending and separate them, using semicolons, within a single set of parentheses. For multiple citations from the same author, include the name only once and list the years of publication chronologically, separated by commas.

Examples: Multiple works by different authors: (Mulder 1997; Scully 1999; Skinner 2000)

Multiple works by the same author:

(Krycek 1996, 1999)

## REFERENCES LIST

Titles of periodicals (newspapers, journals, magazines) are capitalized as they normally are; book titles and article titles have only the first word of the title (and of any subtitles), as well as proper nouns, capitalized. Journal titles should not be abbreviated. Rules for journal abbreviation are complex and the correct abbreviation is not always obvious. Throughout the CSE style, no commas are used to offset the author's last name from his or her initials, no space separates the first and middle initial, and periods do not, in general, follow initials.

### 1. Book

Mec LD. 1988. The Arctic wolf: Living with the pack. Stillwater (MN): Voyageur Press. 128 p.

### 2. Edited book

Reaka-Kudla ML, Wilson DE, Wilson EO, editors. 1997. Biodiversity II: Understanding and protecting our biological resources. Washington (DC): Joseph Henry Press. 551 p.

### 3. Chapter in a book

Allan SA. 2001. Ticks (Class Arachnida: Order Acarina). In: Samuel WM, Pybus MJ, Kocan AA, editors. Parasitic diseases of wild mammals. 2nd ed. Ames (IA): Iowa State University Press. p 72-106.

### 4. Article from a scholarly journal

Cox J, Engstrom RT. 2001. Influence of the spatial pattern of conserved lands on the persistence of a large population of red-cockaded woodpeckers. *Biological Conservation* 100(1): 137-150.

### 5. Article from a magazine

Losos JB. 2001 Marine Evolution: A lizard's tale. *Scientific American* 284(3): 64-69.

**6. Article from a scholarly journal, retrieved from the website**

Philippi TE, Dixon PM, Taylor BE. 1998. Detecting trends in species composition. *Ecological Applications* [Internet]. [cited 2002 Feb 12]; 8(2): 300-308. Available from: <http://www.esajournals.org/esaonline/?request=get-pdf&file=i1051-0761-008-02-0300.pdf>

**7. Article from a scholarly journal, retrieved from an online database**

Birmingham K. 2003. The move to prevent therapeutic cloning. *Journal of Clinical Investigations* [Internet]. [cited 2004 Mar 17]; 112(11):1600. Available from Academic Search Elite: <http://eresources.lib.unc.edu/eid/description.php?EIDID=74>. System Requirements: Adobe Acrobat. Registration required for access.

**8. Conference paper, retrieved from an online database**

Blanchette M. 2003. A comparative analysis method for detecting binding sites in coding regions. In: Vingron, Martin, Istrail, Sorin, Pevzner, Pavel, Waterman, Michael, editors. *Proceedings of the Seventh Annual International Conference on Computational Molecular Biology* [Internet]; 2003 Apr 10-14; Berlin, Germany. New York (NY): ACM Press. [cited 2004 Mar 17]; p. 57-66. Available from: <http://doi.acm.org/10.1145/640075.640082>. System Requirements: Adobe Acrobat. Registration required for access.

**9. Website**

Hilton-Taylor C, compiler. 2000. 2000 IUCN red list of threatened species [Internet]. Gland, Switzerland and Cambridge, UK: IUCN. [cited 2002 Feb 12]. Available from: <http://www.redlist.org/>

**10. Research report published online**

Wellborn TL. 1998. Channel catfish: Life history and biology [Internet]. College Station (TX): Texas Agricultural Extension Service. [cited e from: [http://aquanic.org/publicat/usda\\_rac/efs/srac/180fs.pdf](http://aquanic.org/publicat/usda_rac/efs/srac/180fs.pdf)

**11. Figure or graph from a journal article, retrieved from a journal published online**

Greaves S. 2003. ZAP-ping T-cell activation. *Nat Cell Biol* [Internet]. [cited 2004 Mar 17]; 5(13): [about 4 paragraphs]. Figure 1. CD8-positive T cells incubated with antigen-producing cells; [about 1 screen]. Available from: [http://www.nature.com/ncb/journal/v5/n1/fig\\_tab/ncb0103-13\\_ft.html](http://www.nature.com/ncb/journal/v5/n1/fig_tab/ncb0103-13_ft.html)

## **Ecological Society of America (ESA) Guidelines for Statistical Analysis and Data Presentation (ref: CSE Chapter 12 and elsewhere).**

**Basic philosophy** -- These rules and suggestions proceed from two principles. **(1)** Authors are free to perform and interpret statistical analyses as they see fit. **(2)** The reader needs to be provided information sufficient for an independent assessment of the appropriateness of the method. Thus, the assumptions and (or) the model underlying unusual statistical analyses must be clearly stated and results must be sufficiently detailed. On occasion, more detail than warranted for the final publication may have to be provided to reviewers to allow them to make an informed judgment. The purpose of statistical analysis is to increase the conciseness, clarity and objectivity with which results are presented and interpreted, and where an analysis does not serve those ends it probably is inappropriate.

**Data description** -- Sampling designs, experimental designs, data-collection protocols, precision of measurements, sampling units, experimental units, and sample sizes must be clearly described. Reported information usually includes the sample size and some measure of the precision (standard errors or specified confidence intervals) of estimates, although this may not be necessary or possible in all instances especially for unusual statistics. Graphical data presentation is encouraged. Carefully composed graphs often permit the reader to decide at a glance if data are in danger of violating statistical assumptions.

**Assumptions** -- It is important that the author be satisfied that the assumptions behind any statistical analysis are sufficiently met and that, at least where unusual assumptions are made, unusual procedures are used, or unusual types of data are involved, and that the reader be provided with sufficient information to judge whether any departures from assumptions are severe enough to vitiate the conclusions. The amount of detail provided in any particular instance will depend on the centrality of the statistical test to the conclusions.

**Reporting of analyses** -- The specific statistical procedure must always be stated. If a statistics program or program package was used, a complete citation (including version number) should be given. If necessary, the author should indicate which procedure within a package was used and which method within a procedure was chosen. Such citations may be even more important for reviewers than they are for readers. Unusual statistical procedures need to be explained in sufficient detail, including references if appropriate, for the reader to reconstruct the analysis. To denote levels of significance, actual P values are generally more informative than symbols such as \* and \*\*.

If conclusions are based on an analysis of variance or regression, information sufficient to permit the construction of the full analysis of variance table (at least degrees of freedom, the structure of F-ratios, and P values) must be presented or be clearly implicit. Where ambiguity is possible, the authors must indicate which effects were considered fixed or random and why. Effect size and biological importance must not be confused with statistical significance. Power analyses (determination of type II error rates,  $\beta$ ) occasionally can be very useful, especially if used in conjunction with descriptive procedures like confidence intervals. Such tests are not always routine; for complex or unusual statistical designs, descriptions of such tests should be sufficiently detailed.

## Ecological Society of America (ESA) Guidelines to ASTM Units (ref: CSE Chapter 12 and elsewhere).

### SI QUICK REFERENCE GUIDE:

<http://www.astm.org/author/siquickr.rtf>

### International System of Units (SI) The Modernized Metric System\*

#### UNITS

The International System of Units (SI) is based on seven fundamental (base) units:

#### Base Units

<b>Quantity</b>	<b>Name</b>	<b>Symbol</b>
length	metre	m
mass	kilogram	kg
time	second	s
electric current	ampere	A
thermodynamic temperature	kelvin	K
amount of substance	mole	mol
luminous intensity	candela	cd

and a number of derived units which are combinations of base units and which may have special names and symbols:

#### Examples of Derived Units

<b>Quantity</b>	<b>Expression</b>	<b>Name</b>	<b>Symbol</b>
acceleration			
angular	rad/s <sup>2</sup>		
linear	m/s <sup>2</sup>		
angle			
plane	dimensionless	radian	rad
solid	dimensionless	steradian	sr
area	m <sup>2</sup>		
Celsius temperature	K	degree Celsius	°C
density			
heat flux	W/m <sup>2</sup>		
mass	kg/m <sup>3</sup>		
current	A/m <sup>2</sup>		
energy, enthalpy			
work, heat	N•m	joule	J
specific	J/kg		
entropy			
heat capacity	J/K		
specific	J/(kg•K)		
flow, mass	kg/s		
flow, volume	m <sup>3</sup> /s		
force	kg•m/s <sup>2</sup>	newton	N
frequency			
periodic	1/s	hertz	Hz

rotating	rev/s		
inductance	Wb/A	henry	H
magnetic flux	V•s	weber	Wb
mass flow	kg/s		
moment of a force	N•m		
potential, electric	W/A	volt	V
power, radiant flux	J/s	watt	W
pressure, stress	N/m <sup>2</sup>	pascal	Pa
resistance, electric	V/A	ohm	Ω
thermal conductivity	W/(m•K)		
velocity			
angular	rad/s		
linear	m/s		
viscosity			
dynamic (absolute)(μ)	Pa•s		
kinematic (ν)	m <sup>2</sup> /s		
volume	m <sup>3</sup>		
volume, specific	m <sup>3</sup> /kg		

\*For complete information see *IEEE/ASTM SI-10*.

## SYMBOLS

<b>Symbol</b>	<b>Name</b>	<b>Quantity</b>	<b>Formula</b>
A	ampere	electric current	base unit
Bq	becquerel	activity (of a radio nuclide)	1/s
C	coulomb	electric charge	A•s
°C	degree Celsius	temperature interval	°C = K
cd	candela	luminous intensity	base unit
F	farad	electric capacitance	C/V
Gy	gray	absorbed dose	J/kg
g	gram	mass	kg/1000
H	henry	inductance	Wb/A
Hz	hertz	frequency	1/s
ha	hectare*	area	10 000 m <sup>2</sup>
J	joule	energy, work, heat	N•m
K	kelvin	temperature	base unit
kg	kilogram	mass	base unit
L	litre	volume	m <sup>3</sup> /1000
lm	lumen	luminous flux	cd•sr
lx	lux	illuminance	lm/m <sup>2</sup>
m	metre	length	base unit
mol	mole	amount of substance	base unit
N	newton	force	kg•m/s <sup>2</sup>
Ω	ohm	electric resistance	V/A
Pa	pascal	pressure, stress	N/m <sup>2</sup>
rad	radian	plane angle	m/m (dimensionless)
S	siemens	electric conductance	A/V
Sv	sievert	dose equivalent	J/kg
s	second	time	base unit
sr	steradian	solid angle	m <sup>2</sup> /m <sup>2</sup> (dimensionless)
T	tesla	magnetic flux density	Wb/m <sup>2</sup>

t	tonne, metric ton	mass	1000 kg; Mg
V	volt	electric potential	W/A
W	watt	power, radiant flux	J/s
Wb	weber	magnetic flux	V•s

\*allowed with SI

## Use of Symbols

The correct use of symbols is important because an incorrect symbol may change the meaning of a quantity. Some SI symbols are listed in the Symbol table.

SI has no abbreviations—only symbols. Therefore, no periods follow a symbol except at the end of a sentence.

*Examples:* A, *not* amp; s, *not* sec; SI, *not* S.I.

Symbols appear in lower case unless the unit name has been taken from a proper name. In this case the first letter of the symbol is capitalized.

*Examples:* m, metre; Pa, pascal; W, watt

*Exception:* L, litre

Symbols and prefixes are printed in upright (roman) type regardless of the type style in surrounding text.

*Example:* . . . a distance of 73 km between . . .

Unit symbols are the same whether singular or plural.

*Examples:* 1 mm, 100 mm; 1 kg, 65 kg

Leave a space between the value and the symbol.

*Examples:* 115 W, *not* 115W; 0.75 L, *not* 0.75L  
88 °C, *not* 88°C or 88° C

*Exception:* No space is left between the numerical value and symbol for degree of plane angle.

*Examples:* 73°, *not* 73 °

Note: Symbol for coulomb is C; for degree Celsius it is °C

Do not mix symbols and names in the same expression.

*Examples:* radians per second or rad/s  
not radians/second; not radians/s  
m/s or metres per second,  
*not* metres/second; *not* metres/s  
J/kg or joules per kilogram,  
*not* joules/kilogram; *not* joules/kg

Symbol for product—use the raised dot ( • )



Examples: N•m; mPa•s; W/(m<sup>2</sup>•K)

Symbol for quotient—use one of the following forms:

Examples: m/s or  $\frac{m}{s}$  or use negative exponent

Note: Use only one solidus ( / ) per expression and parentheses to avoid any ambiguity.

Do not use modifying terms such as electrical, alternating current, etc.

Examples: kPa (gage); MW (e); V (ac)

## PREFIXES

Most prefixes indicate orders of magnitude in steps of 1000 and provide a convenient way to express large and small numbers and to eliminate nonsignificant digits and leading zeros in decimal fractions.

Examples: 64 000 watts is the same as 64 kilowatts\*  
 0.057 metre is the same as 57 millimetres  
 16 000 metres is the same as 16 kilometres\*

\*except for intended accuracy

<b>Prefix</b>	<b>Symbol</b>	<b>Represents</b>
yotta	Y	10 <sup>24</sup>
zetta	Z	10 <sup>21</sup>
exa	E	10 <sup>18</sup>
peta	P	10 <sup>15</sup>
tera	T	10 <sup>12</sup>
giga	G	10 <sup>9</sup>
mega	M	10 <sup>6</sup>
kilo	k	10 <sup>3</sup>
hecto	h*	10 <sup>2</sup>
deka	da*	10 <sup>1</sup>
deci	d*	10 <sup>-1</sup>
centi	c*	10 <sup>-2</sup>
milli	m	10 <sup>-3</sup>
micro	μ	10 <sup>-6</sup>
nano	n	10 <sup>-9</sup>
pico	p	10 <sup>-12</sup>
femto	f	10 <sup>-15</sup>
atto	a	10 <sup>-18</sup>
zepto	z	10 <sup>-21</sup>
yocto	y	10 <sup>-24</sup>

To realize the full benefit of the prefixes when expressing a quantity by numerical value, choose a prefix so that the number lies between 0.1 and 1000. For simplicity, give preference to prefixes representing 1000 raised to an integral power (i.e., μm, mm, km).

**\*Exceptions:**

In expressing area and volume, the prefixes hecto, deka, deci, and centi may be required; for example, cubic decimetre (L), square hectometre (hectare), cubic centimetre.

Tables of values of the same quantity.

Comparison of values.

For certain quantities in particular applications. For example, the millimetre is used for linear dimensions in architectural and engineering drawings even when the values lie far outside the range of 0.1 mm to 1000 mm; the centimetre is usually used for anatomical measurements and clothing sizes.

**Compound units.** A compound unit is a derived unit expressed with two or more units. The prefix is attached to a unit in the numerator.

*Examples:* V/m *not* mV/mm  
MJ/kg *not* kJ/g

**Compound prefixes** formed by a combination of two or more prefixes are not used. Use only one prefix.

*Examples:* 2 nm *not* 2 m $\mu$ m  
6 m<sup>3</sup> *not* 6 kL  
6 MPa *not* 6 kPa

**Exponential Powers.** An exponent attached to a symbol containing a prefix indicates that the multiple (of the unit with its prefix) is raised to the power of 10 expressed by the exponent.

*Examples:* 1 mm<sup>3</sup> = (10<sup>-3</sup> m)<sup>3</sup> = 10<sup>-9</sup> m<sup>3</sup>  
1 ns<sup>-1</sup> = (10<sup>-9</sup> s)<sup>-1</sup> = 10<sup>9</sup> s<sup>-1</sup>  
1 mm<sup>2</sup>/s = (10<sup>-3</sup> m)<sup>2</sup>/s = 10<sup>-6</sup> m<sup>2</sup>/s

**NUMBERS**

International practice separates the digits of large numbers into groups of three, counting from the decimal to the left and to the right, and inserts a space to separate the groups. In numbers of four digits, the space is not necessary except for uniformity in tables.

*Examples:* 6.358 568; 85 365; 51 845 953; 88 000;  
0.246 113 562; 7 258

**Small Numbers.** When writing numbers less than one, always put a zero before the decimal marker.

*Example:* 0.046

**Decimal Marker.** The recommended decimal marker is a dot on the line (period). (In some countries, a comma is used as the decimal marker.)

Because **billion** means a million million in most countries but a thousand million in the United States, avoid using billion in technical writing.

## DO'S AND DON'TS

The units in the international system of units are called SI units—*not* Metric Units and *not* SI Metric Units.

Non-SI units in the US are called Inch-Pound units (I-P units)—*not* conventional units, *not* U.S. customary units, *not* English units, and *not* Imperial units.)

Treat all spelled out names as nouns. Therefore, do not capitalize the first letter of a unit except at the beginning of a sentence or in capitalized material such as a title.

*Examples:* watt; pascal; ampere; volt; newton; kelvin

*Exception:* Always capitalize the first letter of Celsius.

Do not begin a sentence with a unit symbol—either rearrange the words or write the unit name in full.

Use plurals for spelled out words when required by the rules of grammar.

*Examples:* metre—metres; henry—henries;  
kilogram—kilograms; kelvin—kelvins

*Irregular:* hertz—hertz; lux—lux; siemens—siemens

Do not put a space or hyphen between the prefix and unit name.

*Examples:* kilometre *not* kilo metre or kilo-metre;  
milliwatt *not* milli watt or milli-watt

When a prefix ends with a vowel and the unit name begins with a vowel, retain and pronounce both vowels.

*Example:* kiloampere

*Exceptions:* hectare; kilohm; megohm

When compound units are formed by multiplication, leave a space between units that are multiplied.

*Examples:* newton metre, *not* newton-metre;  
volt ampere, *not* volt-ampere

Use the modifier squared or cubed after the unit name.

*Example:* metre per second squared

*Exception:* For area or volume the modifier may be placed before the units.

*Example:* square millimetre; cubic metre

When compound units are formed by division, use the word *per*, not a solidus (/).

*Examples:* metre per second, *not* metre/second; watt per square metre, *not* watt/square meter

Do not use modifying terms such as electrical, alternating current, etc. after the symbol.

*Examples:* kPa (gage); MW (e); V (ac)

## SELECTED CONVERSION FACTORS

**CAUTION:** These conversion values are rounded to three or four significant figures, which is sufficiently accurate for most applications. When making conversions, remember that a converted value is no more precise than the original value. Round off the final value to the same

number of significant figures as those in the original value. See ANSI SI 10 for additional conversions with more significant figures.

<b>Multiply</b>	<b>By</b>	<b>To Obtain</b>
acre	0.4047	ha
atmosphere, standard	*101.325	kPa
bar	*100	kPa
barrel (42 US gal, petroleum)	159	L
Btu, (International Table)	1.055	kJ
Btu/lb•°F (specific heat, $c_p$ )	4.184	kJ/(kg•K)
bushel	0.03524	m <sup>3</sup>
calorie, kilogram (kilocalorie)	4.187	kJ
candle, candlepower	*1.0	cd
centipoise, dynamic viscosity, $\mu$		*1.00 mPa•s
centistokes, kinematic viscosity, $\nu$		*1.00 mm <sup>2</sup> /s
ft	*0.3048	m
ft	*304.8	mm
ft/min, fpm	*0.00508	m/s
ft/s, fps	*0.3048	m/s
ft of water	2.99	kPa
ft <sup>2</sup>	0.09290	m <sup>2</sup>
ft <sup>2</sup> /s, kinematic viscosity, $\nu$	92 900	mm <sup>2</sup> /s
ft <sup>3</sup>	28.32	L
ft <sup>3</sup>	0.02832	m <sup>3</sup>
ft <sup>3</sup> /h, cfh	7.866	mL/s
ft <sup>3</sup> /min, cfm	0.4719	L/s
ft <sup>3</sup> /s, cfs	28.32	L/s
footcandle	10.76	lx
ft•lbf (torque or moment)	1.36	N•m
ft•lbf (work)	1.36	J
ft•lbf/lb (specific energy)	2.99	J/kg
ft•lbf/min (power)	0.0226	W
gallon, US (*231 in <sup>3</sup> )	3.785	L
gph	1.05	mL/s
gpm	0.0631	L/s
gpm/ft <sup>2</sup>	0.6791	L/(s•m <sup>2</sup> )
gr/gal	17.1	g/m <sup>3</sup>
horsepower (550 ft•lbf/s)	0.746	kW
inch	*25.4	mm
in of mercury (60°F)	3.377	kPa
in of water (60°F)	248.8	Pa
in•lbf (torque or moment)	113	mN•m
in <sup>2</sup>	645	mm <sup>2</sup>
in <sup>3</sup> (volume)	16.4	mL
in <sup>3</sup> (section modulus)	16 400	mm <sup>3</sup>
in <sup>4</sup> (section moment)	416 200	mm <sup>4</sup>
km/h	0.278	m/s
kWh	*3.60	MJ
kip/in <sup>2</sup> (ksi)	6.895	MPa

litre	*0.001	m <sup>3</sup>	
micron (μm) of mercury (60°F)		133	mPa
mil (0.001 in.)	*25.4	μm	
mile	1.61	km	
mile, nautical	1.85	km	
mph	1.61	km/h	
mph	0.447	m/s	
millibar	*0.100	kPa	
mm of mercury (60°F)	0.133	kPa	
mm of water (60°F)	9.80	Pa	
ounce (mass, avoirdupois)	28.35	g	
ounce (force of thrust)	0.278	N	
ounce (liquid, US)	29.6	mL	
ounce (avoirdupois) per gallon		7.49	kg/m <sup>3</sup>
pint (liquid, US)	473	mL	
pound			
lb <sub>m</sub> (mass)	0.4536	kg	
lb <sub>m</sub> (mass)	453.6	g	
lb <sub>f</sub> (force or thrust)	4.45	N	
lb <sub>m</sub> /ft (uniform load)	1.49	kg/m	
lb <sub>m</sub> /(ft•h) (dynamic viscosity, μ)		0.413	mPa•s
lb <sub>m</sub> /(ft•s) (dynamic viscosity, μ)		1490	mPa•s
lb <sub>f</sub> •s/ft <sup>2</sup> (dynamic viscosity, μ)		47 880	mPa•s
lb <sub>m</sub> /min	0.00756	kg/s	
lb <sub>m</sub> /h	0.126	g/s	
lb <sub>f</sub> /ft <sup>2</sup>	47.9	Pa	
lb <sub>m</sub> /ft <sup>2</sup>	4.88	kg/m <sup>2</sup>	
lb <sub>m</sub> /ft <sup>3</sup> (density, ρ)	16.0	kg/m <sup>3</sup>	
lb <sub>m</sub> /gallon	120	kg/m <sup>3</sup>	
ppm (by mass)	*1.00	mg/kg	
psi	6.895	kPa	
quad (10 <sup>15</sup> Btu)	1.06	EJ	
quart (liquid, US)	0.946	L	
rpm	0.105	rad/s	
tablespoon (approx.)	15	mL	
teaspoon (approx.)	5	mL	
therm (100,000 Btu)	105.5	MJ	
ton, short (2000 lb)	0.907	Mg; t (tonne)	
yd	*0.9144	m	
yd <sup>2</sup>	0.836	m <sup>2</sup>	
yd <sup>3</sup>	0.7646	m <sup>3</sup>	

\*Conversion factor is exact.

Note: In this list the kelvin (K) expresses temperature intervals.  
The degree Celsius symbol (°C) may be used for this purpose as well.

## ALTERNATE SYMBOLS ON YOUR COMPUTER KEYBOARD

⌘ option-shift-e, helvetica (10)

⌘ option-shift-e, helvetica (12)

⌘ option-shift-e, times (10)

⌘ option-shift-e, times (12)

**δ<sup>13</sup>C** d, symbol (12)

**δ<sup>18</sup>O**

⌘ option-shift-e, helvetica (10)

⌘ option-shift-e, helvetica (12)

⌘ option-shift-e, times (10)

⌘ option-shift-e, times (12)

**δ<sup>13</sup>C** d, symbol (12)

**δ<sup>18</sup>O**

**δ<sup>34</sup>S**

⌘ option-shift-e, helvetica (10)

⌘ option-shift-e, helvetica (12)

⌘ option-shift-e, times (10)

⌘ option-shift-e, times (12)

**δ<sup>13</sup>C** d, symbol (12)

**δ<sup>18</sup>O**

⌘ option-shift-e, helvetica (10)

⌘ option-shift-e, helvetica (12)

⌘ option-shift-e, times (10)

⌘ option-shift-e, times (12)

**δ<sup>13</sup>C** d, symbol (12)

**δ<sup>18</sup>O**