

Rule 1

The definite article “the” is used to show that what the *noun* (or noun phrase) *refers to is unique*; that is, it has a *unique referent*. Unlike the indefinite article (i.e. *a* or *an*), the definite article (i.e. *the*) is used with any type of noun – *singular or plural, countable or uncountable*.

Examples:

- *Right*: The sample we measured first turned out to be the brightest.
Wrong: A sample we measured first turned out to be the brightest.
- *Right*: After completing the measurement of the first device, we took a rest.
Wrong: After completing the measurement of a first device, we took a rest.
- *Right*: Then we started solving the mathematic problem that we believed would be simple.
Wrong: Then we started solving a mathematic problem that we believed would be simple.
- The noun may have a *special adjective* as a modifier (e.g. the tallest building, the white horse).
- The noun may be a *special noun* referring to some unique time or place in our common existence (e.g. the AT&T 6300 telephone, the rocking 80's, the Bahamas).
- The noun may be *generic*, that is, it may refer to an entire species or type of something (the planets, the dinosaurs, the RPI students).
- The noun may have the same referent as some *previously mentioned* noun in the present context (... and I recently bought a Toyota Camry. The Camry has the color blue ... We built new laboratories at RPI. The laboratories are well-equipped ...).
- The noun may have a *following modifier* that restricts it to a unique referent (the horse which came first ... the man with a walking stick).
- The noun may have a unique referent by virtue of *shared knowledge* between writer and reader (... the restaurant we are supposed to meet at ... the mountain we climbed last year ...).
- The noun may have a unique referent by *implication* (the son of God ... the discoverer of penicillin).

Rule 2

Whenever an *uncountable noun* is used with *non-unique* (general referent in mind) *no article is used*.

Examples:

- *Magnetism* is the force that causes iron filings to be attracted to a magnet.
- *Energy* is required to perform work.
- My niece says she wants to study *engineering*.

Rule 3

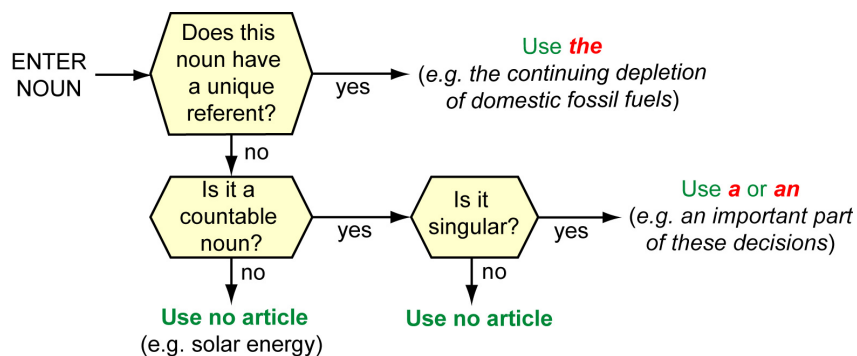
Whenever a *countable noun* is used with a non-unique referent in mind:

1. **The *indefinite article* is used if the noun is *singular*.**
2. ***No article* is used if the noun is *plural*.**

Examples:

- A *betatron* is a device used to accelerate *electrons*.
- The electrons travel around a *circular path* in a *vacuum tube* known as a “*doughnut*”.
- The force of acceleration is supplied by a *magnet*.

The following diagram is helpful in deciding if an article should be used.



Style sheet for writing theses and papers

Equations

- For variables and physical constants, use italic font. **Examples:** e , E (energy), \mathcal{E} (electric field), and h .
- For Greek variables, use roman font. **Examples:** ω , α , and λ .
- For mathematical functions, use roman font. **Examples:** e^x , $\exp x$, or $\ln x$.
- For non-variable symbols use roman font. **Examples:** E_F (the “F” denotes “Fermi” which is a name and not a variable), E_C , and E_V .

Use of past and present tense

- When describing your work presented in the document, use *present* tense. **Examples:** In this paper, we demonstrate a new process ... The samples are etched in sulfuric acid and then immersed ... Epitaxial growth is performed with a V/III ratio of 10 ... The results show ...
- When describing already published work, use *past* tense. **Examples:** Miller *et al.* (2002) showed ... It was demonstrated by Miller (2002) that this process requires ... The authors showed that it is impossible ...

Be most specific when term is used for first time

- When describing a technical issue in your work, be most specific when a term is used for the first time. You may be less specific when term is used subsequently.
- **Example:** “A pulsed current with duty cycle 0.1 % is applied to the device. The current causes practically no increase in the junction temperature of the device.” **This much better than:** “A current is applied to the device. The pulsed current with duty cycle 0.1 % causes practically no increase in the junction temperature of the device.”

Figures

- Draw figures same size as they appear in text. Use font size no less than 10 (Times) and 9 (Arial).
- Acceptable quality: JPEG format 300 dpi resolution. JPEG is a *lossy* compression mechanism.
- Superb quality: TIFF 600 dpi resolution. TIFF is a *non-lossy* compression mechanism.
- **Question:** Can you explain difference between a lossy and non-lossy compression mechanism? (A *non-lossy* compression mechanism will *not* change a figure. A *lossy* compression mechanism will *change* a figure, e.g. will make it looking fuzzy)
- Important: *Link* figures to document in order to avoid excessive file sizes.

Grammar

- Use of “it”. “It” always refers to the noun last used. **Question** – do the following sentences make

sense?

A current-injection laser possesses at least one highly reflective facet. It lases when the current is greater than the threshold current. (Not clear if laser or facet will lase)

Dry ice is solid carbon dioxide that can be made in a high-performance refrigerator. It is used for cooling. (Not clear if dry ice or refrigerator is used for cooling)

- **Exercise** – which of the following sentences sounds better:
I only have one sample left – *or* – I have only one sample left.
I always will feel gratitude towards my teacher – *or* – I will always feel gratitude towards my teacher
The pulsed forward voltage of the device at different temperatures is measured with an oscilloscope – *or* – The pulsed forward voltage of the device is measured with an oscilloscope at different temperatures – *or* – The pulsed forward voltage at different temperatures of the device is measured with an oscilloscope – *or* – The pulsed forward voltage is measured with an oscilloscope at different temperatures of the device.
- **Exercise** – what could be improved in the following sentences?
I am currently away from my desk and not available at this time. (Redundant use of “currently” and “at this time”)
GaAs substrates are absorptive in the visible spectral range; the absorbing nature of GaAs is manifested by the opaqueness of the substrates. (Use of “absorptive” and “absorbing” in same context may be confusing. The two words have the same meaning – so chose one of them and consistently use that term)
Lasers are light emitters emitting a high intensity of light. (A better construction of the sentence would be: Lasers emit light of high intensity)
We first measured the light output-versus-current characteristic of the laser. In addition, we also measured the exact value of the threshold current. (In the second sentence, “In addition” and “also” are redundant)
We first measured the light output-versus-current characteristic of the laser. We also measured the exact value of the threshold current, too. (In the second sentence, “also” and “too” are redundant)
When you join Geico Car Insurance, you will save at least \$ 100 or more. (Poor English is being used by this insurance company; “at least” and “or more” are redundant)
- Know proper use adverbs and adjectives. **Example**: I am highly motivated. I have a high motivation. (“I am high motivated” and “I have a highly motivation” would be incorrect)

Citations

- You may cite by *name* or by *number*.
- **Examples** of citations by name:
Miller *et al.* (1989) showed the importance of a low-temperature buffer layer.
Miller and Chen (1989) showed the importance of a low-temperature buffer layer.
The importance of a low-temperature buffer layer was demonstrated by Miller *et al.* (1989).
A low-temperature buffer layer was demonstrated to be important (Miller *et al.*, 1989).
- **Examples** of citations by number:
A low-temperature buffer [1] layer was demonstrated to be necessary [2].
A low-temperature buffer ^[1] layer was demonstrated to be necessary ^[2].

References

- Journal name in *italic font*. Volume in **bold font**. Year in parenthesis.
- **Examples** of references:
[1] C. P. Kuo, R. M. Fletcher, T. D. Osentowski, M. C. Lardizabal, M. G. Craford, and V. M. Robbins “High performance AlGaInP visible light-emitting diodes” *Appl. Phys. Lett.* **57**, 2937 (1990)
Kuo C. P., Fletcher R. M., Osentowski T. D., Lardizabal M. C., Craford M. G., and Robbins V. M.

“High performance AlGaInP visible light-emitting diodes” *Appl. Phys. Lett.* **57**, 2937 (1990)
Sze S. M. “Physics of semiconductor devices” (John Wiley and Sons, New York, 1981)
Mueller G. (Editor) “Electroluminescence I” *Semiconductors and Semimetals* Vol. **64** (Academic Press, San Diego, 2000)
Chui H., Gardner N. F., Grillo P. N., Huang J. W., Krames M. R., and Maranowski S. A. “High-efficiency AlGaInP light-emitting diodes” in “Electroluminescence I” edited by G. Mueller *Semiconductors and Semimetals* Vol. **64** p. 49 (Academic Press, San Diego, 2000)

Font size

- Text: 12 points
- Table: 11 points
- Captions: 11 points
- Figures: 10 points

Spaces

- Before and after equations: 12 points
- Before and after figures/tables 24 points
- Table (single spaced): 3 points before and after row

General remarks

- Define all acronyms when first used.
- Follow commonly accepted notation and nomenclature.
- You may deviate from this style sheet but you must *be consistent throughout your document.*