



**The most important aspect of grammar is understanding what a sentence is**

**Sentence:** A sentence is group of words with a subject and a verb that expresses a complete thought.

**Fragment:** A fragment being a group of words that is missing a subject, is missing a verb, or does not express a complete thought.

**Run-on:** A run-on has two or more independent clauses that are not joined properly, for instance, a common mistake is to have a comma between the clauses.



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**To recognize a sentence, you first have to recognize clauses and phrases**

although the Titanic had water tight compartments ??????????????

the hull breaking apart underwater ??????????????

the crew, however, was slow to respond ??????????????

when the lifeboats were lowered ??????????????

to test the strength of the steel ??????????????



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**Which are sentences (S), fragments (F), or run-ons (RO)?**

1 Rubidium has no major uses, however, it is more common in the earth than zinc, copper, or nickel. ?

2 Although carbon dioxide occurs naturally, man has dramatically increased its concentration this past century. ?

3 Several systems can detect plastic explosives. For example, thermal neutron activation systems, nitrogen sniffer systems, and enhanced x-ray systems. ? / ?



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Which are sentences (S), fragments (F), or run-ons (RO)?

- 4 About 70% of the world's sulfur dioxide arises from naturally decomposing matter, the remaining 30% comes from man's burning of coal. ?
- 5 A greenhouse makes plants flourish because its transparent glass allows sunlight to pass through, but does not allow the heat inside to escape. ?
- 6 The phenomena are subtle, therefore, observations take place in a darkroom. ?



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Some word groups are difficult to classify

All of which shows that the peace process is unraveling. ?

The higher the temperature, the higher the pressure. ?



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Make the following group of words into sentences

There is no default machine on the web interface, the user must select at least one machine, however, the default machine on the command-line interface is the machine from the program was executed.



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**Making lists parallel is another important aspect of grammar**

- 7 Printed circuit board relays are limited to small coil voltages, contact ratings, and lack multi-pole configurations.



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**Making lists parallel is another important aspect of grammar**

- 8 Animals that come in contact with oil can develop rashes, sores, and may leave the area.



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**Placing a modifier in its appropriate place is also important in grammar**

- 9 These proteins indicate to the body what hormones should be given off among other things.

- 10 In meeting the staff of the Parks Department, the greatest problem was that of water leakage.



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**Unclear pronoun references cause ambiguities**

Although engineers realized the design flaws in the Titanic soon after its sinking in 1912, the reasons for the severe damage inflicted by the iceberg remained a mystery until its discovery in 1985. ???

If you receive an e-mail titled "Win A Holiday," do *not* open it. It will erase everything on your hard drive. Forward this e-mail out to as many people as you can. This is a very malicious virus and not many people know about it. ???



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**Identify the error: faulty parallelism, fragment, misplaced modifier, run-on, or unclear pronoun ref**

An oval shape is necessary in the die cavity, otherwise, the flow of metal would be restricted. ?

Correction:  
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**Identify the error: faulty parallelism, fragment, misplaced modifier, run-on, or unclear pronoun ref**

Scientists have problems assuring that the viral vectors apply themselves to the correct cells. When implanted, they tend to migrate throughout the body and miss targeted cells more often than not. ?

Correction:  
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Identify the error: faulty parallelism, fragment, misplaced modifier, run-on, or unclear pronoun ref

One problem that has baffled engineers since the invention of the catalytic converter is their lack of effectiveness in oxidizing CO and HC while the engine warms. ?

Correction:  
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Identify the error: faulty parallelism, fragment, misplaced modifier, run-on, or unclear pronoun ref

The initial wiring of the LED was not correct, therefore, our display did not work as it should have. ?

Correction:  
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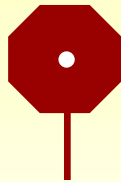
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## Punctuation



Punctuation marks are the traffic signs and signals placed along the reader's road.

Theodore M. Bernstein  
*The Careful Writer*



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**Punctuation rules are designed to have sentences be read one way**

**Colon:** introduces a formal list, long quotation, equation, or definition.

**Semicolon:** either joins two independent clauses (closely linked in thought) or separates complex items in a list.

**Dash:** acts as a parenthesis to separate items that cannot be separated by commas.

**Comma:** separates details in a sentence.



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**A colon introduces a formal list, long quotation, equation, or definition**

**We studied five types of marsupials: opossums, bandicoots, koalas, wombats, and kangaroos.**

**The laboratory growth of this crystal made possible a new astronomical tool: a gamma-ray detector with high-energy resolution.**

*In formal writing, what is on the left side of the colon should stand alone as a separate sentence.*

*Once the list ends, the sentence ends.*



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**Em-dashes act as parentheses to separate items that commas cannot**

**Because two isotopes of hydrogen—deuterium and tritium—are lightweight, can be produced easily, and require little energy, they are prime candidates to begin the fusion process.**

**After one year, we measured mirror reflectivity at 96 percent—a high percentage, but not as high as originally expected.**

**Because two isotopes of hydrogen (deuterium and tritium) are lightweight, can be produced easily, and require little energy, they are prime candidates to begin the fusion process.**

**After one year, we measured mirror reflectivity at 96 percent (a high percentage, but not as high as originally expected).**



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**Commas separate introductory phrases and clauses**

After cooling the exhaust gases continue to expand.



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**Commas separate parenthetical details**

X-ray backscatter systems, which are relatively inexpensive require the operator's attention.



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**Commas separate items in a list**

Discharges of these hazardous substances occurred through spills when loading vehicles, spills and over-spills when filling the tanks, leaks from supply pipes, corroded welds and rust holes and cracks in the seams of the tanks themselves.



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Name the error: missing comma, unwanted comma, unwanted colon, or incorrect choice of punctuation

As the flame front propagates hot combustion products expand, resulting in a rapid pressure increase. ???

Correction:  
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Name the error: missing comma, unwanted comma, unwanted colon, or incorrect choice of punctuation

We studied five types of marsupials; opossums, bandicoots, koalas, wombats, and kangaroos. ???

Correction:  
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Name the error: missing comma, unwanted comma, unwanted colon, or incorrect choice of punctuation

The new conductor, which will be available next week is composed of barium, copper, and oxygen. ???

Correction:  
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Name the error: missing comma, unwanted comma, unwanted colon, or incorrect choice of punctuation

The transmission fluid serves as a medium for hydrodynamic energy in the torque converter, hydrostatic energy in the servos and logic circuits and sliding friction energy in the clutches. ???

Correction:

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Name the error: missing comma, unwanted comma, unwanted colon, or incorrect choice of punctuation

The three largest divisions are: production, marketing, and research and development. ???

Correction:

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Name the error: missing comma, unwanted comma, unwanted colon, or incorrect choice of punctuation

The synergistic reactor contains a chamber in which the exhaust from the burning coal mixes with limestone; see Appendix A. ???

Correction:

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**Name the error: missing comma, unwanted comma, unwanted colon, or incorrect choice of punctuation**

As World War II escalated the United States became locked into a race with Germany to develop an atomic bomb. ???

Correction:  
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**Name the error: missing comma, unwanted comma, unwanted colon, or incorrect choice of punctuation**

Every year, an earthquake of magnitude between 8.0 and 8.9 on the Richter scale, will be experienced somewhere in the world. ???

Correction:  
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**In a reference citation, which should be in italics\* and which should be in quotation marks**


Title of Book

Title of Journal Article

Title of Journal

Title of Newspaper Article

\*Underlining is a poor man's italics.



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In the United States, should the end quotation marks go inside or outside the comma?

Gannon, Robert, "What Really Sank the Titanic", *Popular Science*, vol. 246, no. 2 (February 1995), pp. 49-55.

or

Gannon, Robert, "What Really Sank the Titanic," *Popular Science*, vol. 246, no. 2 (February 1995), pp. 49-55.



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While illustrations appear after the paragraph, equations appear within the paragraph

The strain,  $\epsilon$ , was found from equation 1:

$$\epsilon = \frac{\sigma}{E}, \quad (1)$$

where  $\sigma$  is the stress estimated by the computer code, and  $E$  is the modulus of elasticity of aluminum.



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While illustrations appear after the paragraph, equations appear within the paragraph

The strain,  $\epsilon$ , was found from the following equation:

$$\epsilon = \frac{\sigma}{E}, \quad (1)$$

where  $\sigma$  is the stress estimated by the computer code, and  $E$  is the modulus of elasticity of aluminum.



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While illustrations appear after the paragraph, equations appear within the paragraph

The strain,  $\epsilon$ , was found from

$$\epsilon = \frac{\sigma}{E}, \quad (1)$$

where  $\sigma$  is the stress estimated by the computer code, and  $E$  is the modulus of elasticity of aluminum.



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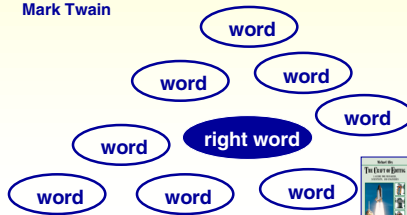
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## Usage

Choose the right word, not its second cousin.  
The difference between the right word and the almost right word is the difference between "lightning" and "lightning-bug."

Mark Twain



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Not all usage rules are constant with respect to time

1700s: "an historical..."

1900s: "a historical..."

1900: X rays

1950: X-rays

1995: x-rays

C & E News (1985): 1980's

C & E News (1995): 1980s



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**Not all usage rules are constant with respect to position**

William Strunk and E. B. White, *The Elements of Style*:

*Data*: A plural, like *phenomena* and *strata*.

*Merriam-Webster Dictionary of English Usage*:

In its current use, *data* occurs in two constructions: as a plural noun (like *earnings*) taking a plural verb...and as an abstract mass noun (like *information*) taking a singular verb...



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**Two common usage errors are possessives and subject-verb disagreements**

The criteria for assessing the environmental effects of acid rain (are / is) given in the next section. ???

So far, the daily number of engineers applying (has / have) remained constant. ???

In August, I am scheduled to complete my (masters / master's) degree. ???

In accordance with my (boss' / boss's) schedule, the first series of computers was replaced. ???



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**Subject-verb disagreements often arise from words with unusual plurals**

**Singular**

- crit<sup>erion</sup>
- medi<sup>um</sup>
- the number of pins
- phenomenon
- series
- stratum

**Plural**

- crit<sup>eria</sup>
- medi<sup>a</sup>
- a number of pins
- phenomena
- series
- strata



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**In usage, the possessive of a singular noun sometimes poses a problem**

When the word ends in a sound other than *s*, add 's.

master's thesis\*  
Illinois's highways  
Des Moines's mayor  
NASA's aim  
someone else's guess

When the word ends in an *s* sound, be guided by pronunciation.

the witness's testimony  
Congress's intention  
Dallas's economy  
but  
Mount St. Helens' eruption

\*master of science




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**To decide upon the verb tense in a document, you first plant a reference flag for a reference time**

**Past Tense:**  
Events that have already occurred

**Present Tense:**  
Timeless details or details at time of reading

**Future Tense:**  
Events that will occur after project



$t = 0$

$t$

The pressure was...  
For the experiment, we assumed...

Air is 79 percent nitrogen.  
Figure 1 shows...  
This section presents...

Future work will focus on...

In these flows, velocity (depends / depended) on pressure.




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**The verb tenses of sentences related to the document depend upon their position**

**Introduction**

This report *presents* a design for connecting light emitting diodes to the HC11 microcontroller.

**Results and Discussion**

...Figure 1 *shows* the circuit that connects the light emitting diodes to the HC11 microcontroller.

**Conclusions**

This report *has presented* a design for connecting light emitting diodes to the HC11 microcontroller. As was shown in Figure 1, the circuit...




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**Certain words are commonly misused**

It appears (as if, like) the Department of Energy will choose the third option. ???

(Regrettably / Regretfully), the launch was delayed because of thunderstorms. ???

You need not proceed any (farther / further) on your test. ???



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**Non-words and nonsensical groupings of words also cause problems**

Whichever design you choose is (alright / all right) with me. ???

(Irregardless / Regardless) of the shipping delay, the work will stop because of the strike. ???

Applying that set of constraints is a (most unique / unique / very unique) way to approach the problem. ???

The serum had (alot / a lot) of side effects. ???

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**Use numerals when referring to measurements**

**When to use numerals**

Specific measurements      3 volts, 2 seconds, 1 m/s

Percentages                 15 percent

Monetary figures            \$3000

Large numerals              5 million

**When to write out numbers**

Counting (one or two words)    twenty-three microscopes

Informal measurements        two hours

First word of sentence         Thirty-three...



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**Many rules exist for using hyphens in compounds**

**When to use hyphens**

Adjective + noun	cost-effective IBM-compatible
Adjective + noun + <i>ed</i>	coarse-grained
Adjective + adjective (before)	high-pressure vessel

**When not to use hyphens**

Established compounds	nuclear energy plant
Adverb with <i>ly</i> + participle	clearly defined set
Adjective + adjective (after)	vessel that is high pressure

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**Choose the correct word**

The serum had serious side ( affects / effects ).

A company's success depends on ( its / it's / its' ) employees.

The new material is ( composed / comprised ) of plastic and iodine.

Reduced weight was the ( principal / principle ) reason for choosing aluminum.



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**Choose the correct word**

Last year, Japan ( lead, led ) the world in automobile sales.

When a photon in that energy range strikes the atom, the atom ( loses, loses ) one of its outer electrons.

All three bombings involved explosives ( that / , which ) contained the chemicals PETN and RDX.

All three bombings involved Semtex ( that / , which ) contains the chemicals PETN and RDX.



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**Choose the correct word**

To treat a bite from the puff adder, select the anti-venom serum ( that counteracts the adder's venom / , which counteracts the adder's venom ).



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**Choose the correct word**

We produced a small ( amount / number ) of automobiles this year, even ( fewer / less ) than last year.

The talk centered ( around / on ) the ( principal / principle ) of virtual work.

( Hopefully, / It is hoped that ) the antibodies will destroy the cancer cells.

Thank you for the job offer. I am ( anxious / eager ) to begin work next month.



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**Choose the correct word**

Following those descriptions, the criteria for assessing each system ( are / is ) given.

In the past three months, a new series of low-priced computers ( has / have ) been released.

Over the past three weeks, our team made ( continual / continuous ) improvements to the design.

When you receive my ( boss' / boss's ) memo, please respond quickly.



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**Choose the correct word**

We then sent the broken part to John Brooks, ( who / whom ) the laser group had recommended.

Neither the engineers ( nor / or ) the technicians were hurt in the blaze.

Those turbulence values were different ( from / than ) ours.

The Department of Energy is ( adverse / averse ) to that type of solution.



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**Choose the correct word**

( Because of / Due to ) the threat to the owl's habitat, the EPA forbids logging in that region.

Neither the engineers ( nor / or ) the technicians were hurt in the blaze.

Those turbulence values were different ( from / than ) ours.

The Department of Energy is ( adverse / averse ) to that type of solution.



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**Choose the correct word**

The truss had spans of 210 feet and was ( more than / over ) 20 feet deep.

The ( enormity / enormousness ) of the solar receiver's tower surprised the visiting officials.

Compared ( to / with ) molten salt, liquid sodium is a much more dangerous fluid.

The new antidote made the patients feel ( nauseated / nauseous ).



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**Decide which form is correct**

Our experiment had ( 3 / three ) transducers.

The velocity was ( 3 / three ) m/s.

We reduced the power by ( .3 / 0.3 / zero point three ) percent.

( 54 / Fifty-four ) sets of data were taken in all.



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**Three excellent sources address the detailed questions of form**

Theodore Bernstein, *The Careful Writer* (New York: Atheneum, 1969).

*The Chicago Manual of Style* (Chicago: University of Chicago Press).

William Sabin, *The Gregg Reference Manual*, 9th ed. (New York: 2001).



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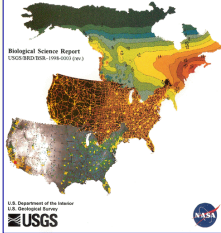
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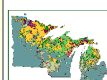
**In summary, when your writing is free of errors, the audience can focus on the content**

**Perspectives on the Land Use History of North America: A Context for Understanding Our Changing Environment**



**General Land Office Survey Records of the Mid-nineteenth Century**

The General Land Office Survey (GLO) of the mid-nineteenth century produced data that can now be used to identify the type of forests that existed at that time (Hansen 1998). Surveyors delineated knowledge boundaries using "winged" and "wingless" trees. The trees were drawn in a systematic manner, identified by species, recorded in log books, and blazed (marked) to enable relocation of the survey boundaries. Today, 150 years later, the blazes have almost all gone, but the data recorded during the survey remain. These data are a valuable record of mid-nineteenth century forests and can be used to develop maps of present-day forest distributions.



Using geographic information systems (GIS; Coaker 1997), and northern white oak (*Quercus acuticarpa*) and are mapped together with various conifer forest (black spruce (*P. marianus*) and tamarack (*Larix laricina*)). Pine forests are dominated by white pine (*Pinus strobus*), red pine (*P. resinosa*), or jack pine (*P. banksiana*).



Northern mixed forests are mostly mixtures of sugar maple (*Acer saccharum*), hickory (*Hic. americana*), yellow birch (*Betula alleghaniensis*), hemlock (*Thuja occidentalis*), and hemlock (*Thuja canadensis*) with some oak. Aspen-birch forests consist primarily of aspen (*Populus tremuloides*) and paper birch (*Betula papyrifera*). Oak forest consists of forest and savanna areas of red oak (*Quercus rubra*), black oak (*Q. velutina*), white oak (*Q. alba*), and bur oak (*Q. macrocarpa*). Wetland forests are located forests consisting primarily of American elm (*Ulmus americana*), green and black ash (*Fraxinus pennsylvanica* and *F. nigra*), and silver maple (*Acer saccharinum*). Mixed forest areas include eastern hemlock, and other areas.



The maps produced for this study represent a broad overview and are general in regard to more specific locations and their communities. Various agencies in all three states are currently producing much more detailed and accurate maps of present-day forest and modern land-use classification using GIS. Future research will allow more thorough mapping of even larger

Fig. 4. 3a. Map showing the changes in forest types between present-day and mid-nineteenth century.

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