

# Hierarchy of a Scientific Paper

Letters

Words

Phrases

Sentences

Topic Sentences

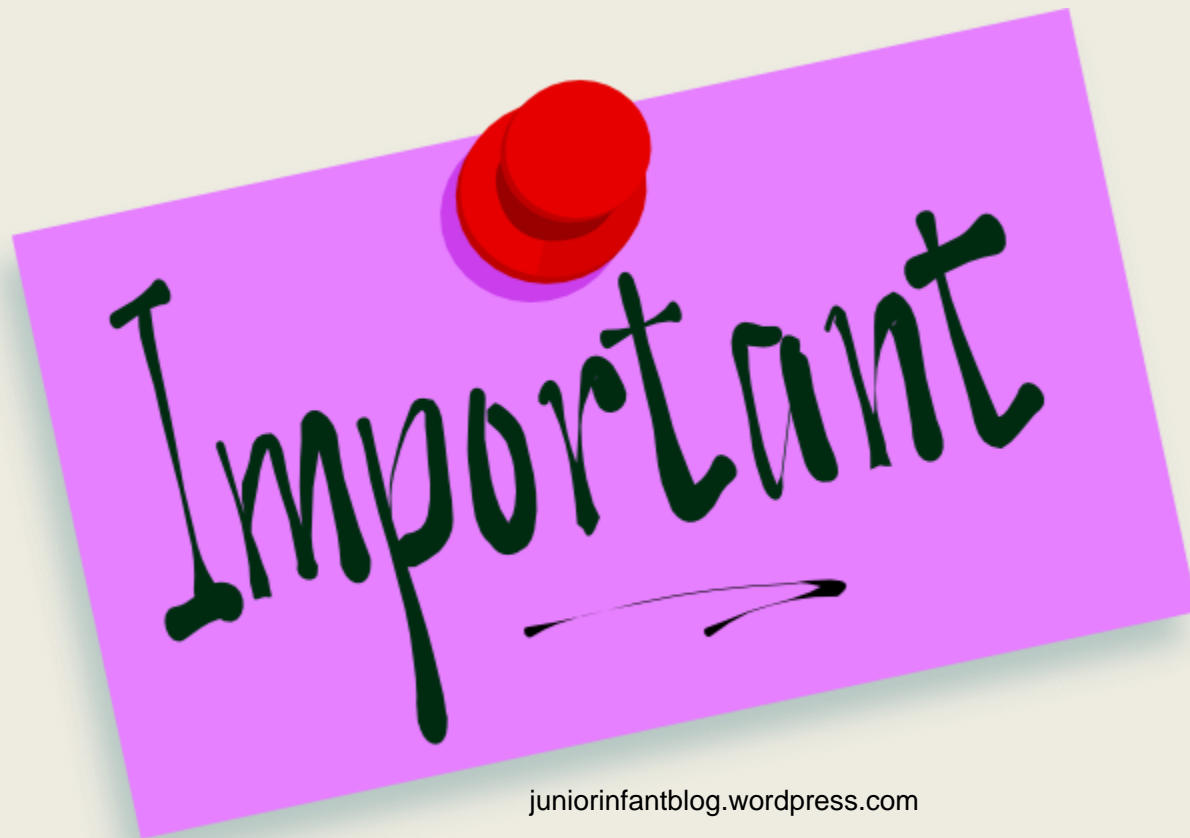
Paragraphs

Sections

Manuscript



# SOME IMPORTANT CONSIDERATIONS ABOUT WORDS



[juniorinfantblog.wordpress.com](http://juniorinfantblog.wordpress.com)

# Unique

- **Unique** means one of a kind
- You cannot be very unique or rather unique, just unique

The student trying to pay her fees with an expired credit card was in a **unique** position.



# Among vs. Between

- **Between** is used with two choices
- **Among** is used with more than two choices



Antonio had a difficult time deciding **between** the two restaurants, but an even harder time deciding **among** his four girl friends.

# While vs. Whereas

- **While** means during the time or an interval of time (**temporal**)
- **Whereas** means in contrast to, on the contrary

John worked on his proposal homework **while** he was on spring break, **whereas** Peter did not.



# Because vs. Since

- **Because** means 'for the reason that'
- **Since** means 'from then till now'

The scientific writing student had a very hard time completing his homework by the deadline **since** he had been playing video games nonstop **since** last week.



because  
is correct



# It's vs. Its



- **It's** is a contraction of it is or it has
- **Its** is a personal pronoun, the possessive form of it

**It's** too bad that **its**\* hard disk was fried when lightning struck yesterday.

\*Its refers to the computer

# And versus Or

- **And** is a logical operator and means two or more items occur together a connector.



[commons.wikimedia.org](https://commons.wikimedia.org)

- **Or** is used to link alternatives; a choice.



[mbalifecycle.com](http://mbalifecycle.com)

☹ The medium contained glucose at 0, 10, 20, **and** 50 mg/L.

☺ The medium contained glucose at 0, 10, 20, **or** 50 mg/L.



# Strange plurals....

<i>Singular</i>	<i>Plural</i>
Datum	Data
Criterion	Criteria
Phenomenon	Phenomena
Stratum	Strata
Focus	Foci
Nucleus	Nuclei
Appendix	Appendices
Thesis	Theses



[primerohijar.blogspot.com](http://primerohijar.blogspot.com)

# Three types of sentences

1. Simple sentences – contain one main idea
2. Compound sentences – contain two main ideas that are closely related and joined by conjunctions (and, but, or)
3. Complex sentences have one main idea and one subordinate idea related to it (If...., then....)



# Constructing sentences



coffeeexpresshemel.com

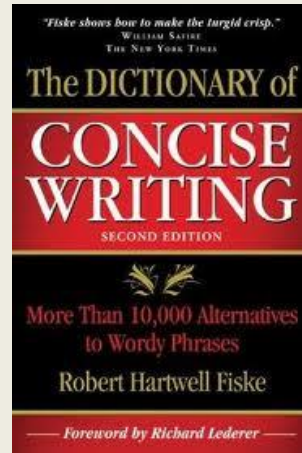
- Try to put the most important idea up front
- Try to keep the verb close to the subject
  - NO: “The mean for Treatment A was”\*\*
  - YES: “For Treatment A, the mean was”\*\*
- Avoid “respectively”
  - NO: “Results for Treatment 1, 2, and 3 were X, Y, and Z, respectively”
  - YES: “Results for Treatment 1 was X; for Treatment 2, Y and for Treatment 3, Z.

\*\* both are acceptable

# Keep your writing tight!

“Graduate students can plan in advance to search previous literature for a period of two months to keep from again repeating others’ past experiences and to gain new facts on different alternatives for conducting their research. By referring back to the literature, they can totally eliminate the chance of not focusing on something completely unique.”

vocabula.com



# Verb-Subject Agreement



shutterstock.com

- A verb should agree in number with its subject

“Data are presented in Table 1.”
- “Each”, “either”, “everybody”, “neither”, “nobody”, and “none” require the singular verb
- Use the singular with subjects connected by “or” or “nor”
- Use plural for subjects connected by “and”

# Beware of “Misplaced Modifiers”

These are a word, phrase, or clause that is placed too far away from the noun or pronoun that it describes

The professor posted the notes for the students covered in class.

Born at the age of 42, the baby was a great joy to her mother.



# Misplaced modifiers



“I knew a man with a wooden leg named George.”

(What was the name of his other leg?)

“How many people do you employ broken down by sex?”

(None, the problem here is alcohol!)

“A large mass of literature has accumulated on the cell walls of staphylococci.” (It did?)

# Confused antecedents

Occurs when you cannot tell what the pronoun refers to (its antecedent)

“Free **information** about halitosis.  
To get **it**, call 1-800-444-5050.”





# Confused antecedents

- "The flavor was evaluated by an experienced *taste panel*, and *it* was deemed obnoxious."
- "All samples in Lot II were discarded when *the authors* found that *they* were contaminated with alcohol, rendering *them* unstable." [and unable to think clearly?]
- "The guidelines were submitted to *the deans*, but *they* subsequently were ignored."



# Avoid overuse of any word

“On average, reciprocal **differences** were not associated with **differences** in cytoplasm, as the **differences** between the six crosses in *Hordeum vulgare* cytoplasm vs. the six crosses in *H. spontaneum* cytoplasm were not **different** ( $P < 0.05$ ) in any instance.”



# Always define acronyms at first use

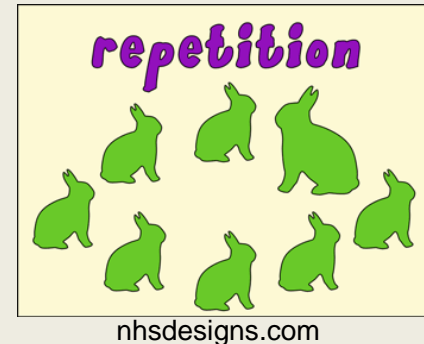
- If you are going to use a word a lot (**not alot**), it is all right (**not alright**) to assign that word an abbreviation (**acronym**), which can be used in its place. Do not define acronyms for words that will be used only once.
- You define an acronym like this:

“All of the plants treated with paclobutrazol (PBZ) responded with reduced elongation growth. Some plants also exhibited chlorosis, which PBZ is known to induce.”



# Avoid needless repetition

- “The plots **were** sprayed twice and **were** dusted once”
- “The plots were sprayed twice and dusted once”
- “**I** collected the fruit, **I** transported them to the lab, and **I** placed them in the drier.”
- “I collected the samples, transported them to the lab, and placed them in the drier.”



# Do not anthropomorphize

- **Anthropomorphizing** is endowing plants or non-human things with human will or discretion.

“Trees **attempt** to avoid drought by...” vs.

“Trees tend to employ a variety of techniques to avoid drought”

“This species has been **plagued** by...” vs.

“This species has been decimated by...”

forums.epczone.net



# Do not use contractions in formal writing!

- Contractions are shortened forms of words with an apostrophe indicating where letters were left out
- Examples are:
  - He'll for "he will"
  - She's for "she is"
  - He's for "he is" or "he has"
  - They're for "they are"



# Be Accurate !



pmarketingllc.com

- “Treatment Y was 20 cm high.”  
(the treatment was measured!)  
“Plants in treatment Y were 20 cm high.”
- “A pH of 6.3 had the highest leakage.” (the pH leaked!)  
“A pH of 6.3 induced the highest leakage.”
- “More flowering occurred in the pinched plots.”  
(plots were pinched!)  
“More flowering occurred in the plots containing pinched plants.”

# Strategies for Writing – A Few Simple Ideas

- Topic Sentences and Paragraphs
- Parallel Construction
- Some Grammar Demons
- Use of Pronouns and Jargon
- Experimental Units?
- Etc.





# Strategies for Writing Topic Sentences

Use Simple Declarative Sentences

SUBJECT ---- VERB ---- OBJECT

After considering his options, the lazy brown and white cat got to it's feet, padded slowly toward the mouse that was eating cheese on the other side of the expansive ballroom.

The cat chased the mouse across the room.



# Strategies for Writing



## Topic Sentences for Paragraphs

Introduction to a paragraph – usually would be the sentence in your outline. “Apples are very important to the horticultural economy in Germany.”

All sentences in this paragraph would relate to this “TOPIC”.

An example of a very good opening topic sentence

**Bermudagrass** (**Cynodon spp.**) **is** a warm-season **grass** used as turf for home lawns, public parks, golf courses, sports fields and for forage and soil conservation (Zhang et al., 1999).

## **Supporting Sentences**

Common bermudagrass (*C. dactylon*,  $2n=4x=36$ ) was first introduced into the United States during the colonial period (Kim et al., 2008) and has spread throughout the south. Cultivar releases from Tifton, GA are predominately generated by crossing African bermudagrass (*C. transvaalensis*,  $2n=2x=18$ ) with common types to produce sterile triploid hybrids with improved turf qualities, although other turfgrass breeding programs have recently developed improved vegetatively- or seed-propagated tetraploid cultivars.

# Strategies for Writing



thefoodenquirer.com

➤ Invest lots of time and thought into topic sentences

➤ Be sure that the correct subject is first in the sentence

**Apples** are important to the horticultural econ.

The horticultural econ. is affected by apples. . .

➤ **NEVER** start a topic sentence with a citation

Morris (1987) found that apples were important . . .



## Original Topic Sentence

**Differential Scanning Calorimetry (DSC)** has been used to carry out a comprehensive study on the thermal properties of tomato fruit cuticle and cutin during growth (Luque and Heredia, 1997; Matas et al., 2004a).

## Rewritten Topic Sentence

**The thermal properties** of tomato fruit cuticle and cutin during growth have been studied using differential scanning calorimetry (DSC) (Luque and Heredia, 1997; Matas et al., 2004a).



## Original Topic Sentence

This\* **second-order transition** could explain the changes observed in cuticle permeability to water, low molecular weight molecules and ions as a function of temperature.

## Rewritten Topic Sentence

**The changes observed** in cuticle permeability to water, low molecular weight molecules and ions as a function of temperature could be explained by a second order transition.

“**This**” refers ambiguously back to the previous paragraph and should be avoided.

## Original Topic Sentence

Matas et al. (2004b) **showed that** the elastic modulus ( $E$ ) of the cuticle is higher than that of the peel tissue, **while** the work of fracture, the amount of energy required to propagate a crack, exhibited an opposite trend.



## Rewritten Topic Sentence

**The elastic modulus ( $E$ )** of the cuticle is higher than that of the peel tissue, **whereas** the fracture, the amount of energy required to propagate a crack, exhibited an opposite trend (Matas et al., 2004b)

## Corrections to Original Topic Sentence

- Sentence now has the **true subject** of paragraph
- **WHILE** is TEMPORAL; **WHEREAS** is COMPARATIVE
- **CLEFT TRANSFORMATION** has been eliminated

## Original Topic Sentence

**This role** was recently analyzed by **Domínguez et al. (2009)**, showing that **they** contribute to the elastic phase, reinforcing the elastic contribution of the polysaccharide fraction and increasing cuticle rigidity, *i.e.*, they play a similar role to that already suggested for waxes.

## Rewritten Topic Sentence

**Flavanoids** contribute to the elastic phase, reinforcing the elastic contribution of the polysaccharide fraction and increasing cuticle rigidity, *i.e.*, **they** play a similar role to that already suggested for plant waxes (**Dominguez et al., 2009**).



**Flavanoids** contribute to the elastic phase, reinforcing the elastic contribution of the polysaccharide fraction and increasing cuticle rigidity, *i.e.*, **they** have a similar role to that already suggested for plant waxes (Dominguez et al., 2009).

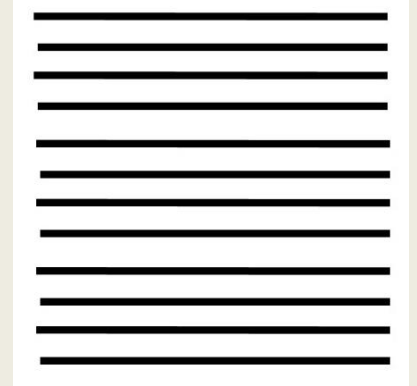


Corrections to sentence:

- Cannot start paragraph with “This role” refers subject to previous paragraph – now **“Flavanoids”** True subject.
- Substitution of personal pronoun improper – **“they”** cannot be assigned to “this role” – singular. “they” now refers to “Flavanoids” plural and true subject.
- **Citation** misplaced – a substitution along with “this role”. Now properly position at the end of the sentence.

# PARALLEL CONSTRUCTION IN SENTENCES

- Better flow of the sentence
- Easier to read
- More suitable for longer sentences



[artsandcraftsatgaresti.wikispaces.com](http://artsandcraftsatgaresti.wikispaces.com)

Usually refers to the tense of the verbs

Past Passive (ed)

Transitory (ing)

# PARALLEL CONSTRUCTION

## NON-PARALLEL

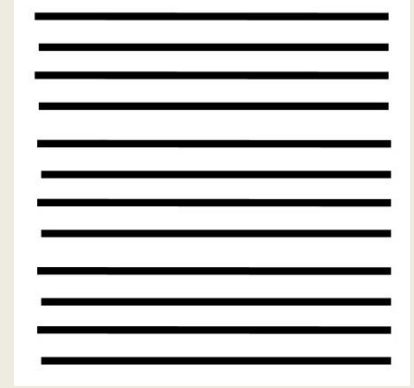
The students **worked** in the laboratory  
and **were studying** chemical reactions.

## PARALLEL

The students **worked** in the laboratory  
and **studied** chemical reactions.

or

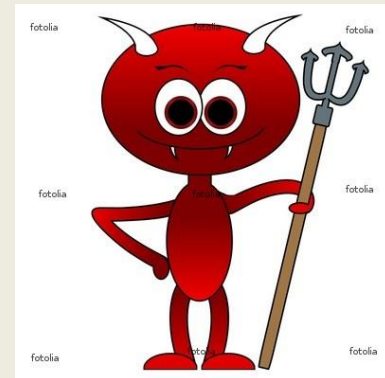
The students **were working** in the laboratory  
and **were studying** chemical reactions.



[artsandcraftsatgaresti.wikispaces.com](http://artsandcraftsatgaresti.wikispaces.com)

# Some Grammar Demons

Independent vs. Dependent Clauses



us.fotolia.com

“that” and “which”

The story **that he told to the children** was very funny.

Independent Clause. **No comma.**

The story, **which he told to the children**, was very funny.

Dependent Clause. **Demands a comma.**

# MORE ON THAT AND WHICH

The story **that he told to the children** was very funny.

In this case, “that” typically indicates that the phrase “he told the children” is essential information.

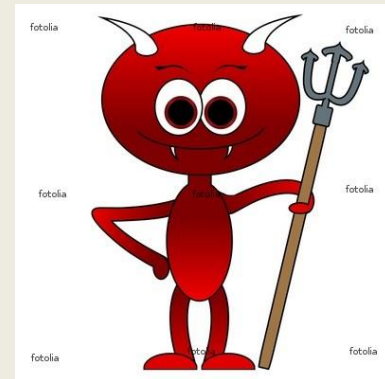
The story, **which he told to the children**, was very funny.

In this case, “which” indicates that the phrase “he told the children” is not essential.

The sentence could be written as:  
“The story was very funny”



# Some Grammar Demons



us.fotolia.com

## Lists and use of colons and **direct objects**

When using a colon (:), such as with a list, it must follow immediately after the direct object.

The colors available on new cars are: red, white, blue and black.

The colors available on new cars are **the following**: red, white, blue and black.

The following colors are available on new **cars**: red, white, blue and black.

# Some Grammar Demons

## Use of the semicolon (;)



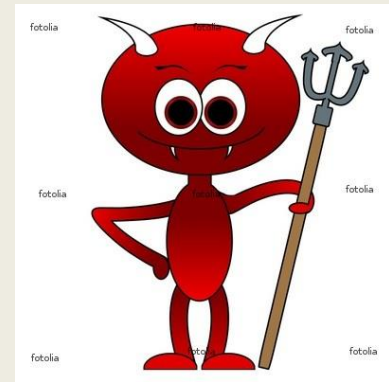
- Complex sentences – Conjunctions

Most of the cats were white; however, some were brown.

- Lists with long phrases instead of single words

The sea captain's treasures included the following: a lantern from a pirate ship; the British flag from battleship; and the sword of Long John Silver.

# Some Grammar Demons



us.fotolia.com

## Subject – Verb Agreement

Use plural form of verbs with plural nouns

Data **were** very good\*\*.

The datum **was** very good.

Species **were** abundant

The species **was** abundant

\*\* Data can now be used as a singular



# Commas

- Use a comma after introductory phrases or clauses

“When feeding, a shark often mistakes undesirable food items for something it really desires.”

“After cooling, the exhaust gases continue to expand until the density reaches that of ambient air.”



[marinesciencetoday.com](http://marinesciencetoday.com)

Try reading them without the commas to see why the comma is necessary!

# Semicolons

- Used to separate two closely related independent clauses

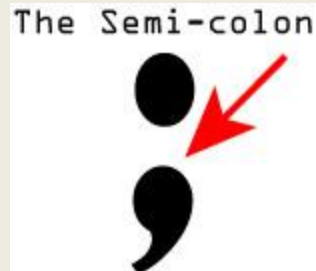
“Lead me not into temptation; I can find the way myself.” Rita Mae Brown

- Used before a conjunctive adverb

“Most of the cats were white; however, some were brown.”

- Also used to separate items in a list when those items themselves contain commas.

“On the table were oranges from Florida; pears from Washington, Oregon, and California; and apples from Oregon.”



# Colons



[mostlymaddi.blogspot.com](http://mostlymaddi.blogspot.com)

- A colon is used to introduce a word, phrase, clause, or sentence

“There was only one appropriate response: run.”

“Chloroplasts: Structure Defines Function”

- A colon also introduces a list and directly follows the direct object

“My shopping list included the following: milk and butter.”

**But not this way:**

“My shopping list included: milk and butter.”

*Another example:*

*Wrong:* The colors available on new Fords are: red, white, blue, and black.

*Right:* The colors available on new Fords are the following: red, white, blue, and black.

*Right:* The following colors are available on new Fords: red, white, blue, and black.

# Use of Personal Pronouns I, We, They, Us, Our . . .



Most commonly used personal pronoun is “We” with the active voice. “We investigated the effects of defoliation on larva feeding behavior.”

“We” is not necessary – the reader knows that you and other authors did the work and wrote the article.

“The effects of defoliation on larva feeding behavior were investigated.” is more concise and economical.

# JARGON or SLANG



[meetupspakeup.blogspot.com](http://meetupspakeup.blogspot.com)

Most instructions to authors will explicitly state that authors should AVOID slang or technical jargon.

Defined as informal speech, often vulgar. Slang is often defined by specific groups and short-lived. Non-standard language often not concise.

Can also be specific to technical fields. For example, “The DNA was **PCRRed** for the ITS region.”

# SLANG AND JARGON

## Slang in the Literature



[meetupspeakup.blogspot.com](http://meetupspeakup.blogspot.com)

A considerable number of

A decreased amount of

A decreased number of

A majority of

Absolutely essential

Accounted for by the fact

As a matter of fact

Considerable amount of

Despite the fact that

Due to the fact that

Entirely eliminate

Have the appearance of

In a number of cases

It has been reported (found) by Smith

many

less

fewer

most

essential

because

(omit, not necessary)

much

although

because

eliminate

appeared or looked like

sometimes

Smith reported

# End of Session 2

Topic sentence and their importance

Some Important considerations

Where to place citations

Some grammar demons

Agreement between subject, verb and objects

Slang



gnadj.wordpress.com