


Scientific Writing in English  
— 英语科研论文写作 —



Lecture 14 Friday 06.11.2015  
(13.30-15.10pm/19.00-20.30pm/)

---

---

---

---

---

---

---

Scientific Writing in English  
— 英语科研论文写作 —

Volunteers for Note Taking  
(Chinese/English)

compiled version to:

赵竹轩 zhaozhuxuan@ucas.ac.cn  
&  
吕平平 pplv10@126.com

---

---

---

---

---

---

---

Scientific Writing in English  
— 英语科研论文写作 —

OVERVIEW - Module 2

Unit 1: Approach to Academic Writing  
**Unit 2: Writing General -> Specific Texts**  
Unit 3: Structure of Problem-Solution Texts  
Unit 4: Data Commentary  
Unit 5: Writing Summaries  
Unit 6: Writing Critiques  
Unit 7: Constructing a Research Paper I and II

---

---

---

---

---

---

---

Scientific Writing in English  
— 英语科研论文写作 —

OVERVIEW - Module 2  
Unit 2: General-Specific Texts

**1. General statements**  
2. Definitions  
3. Language Focus: Defining and Naming  
4. Language Focus: Grammar of Definitions  
5. Variations in Definitions

---

---

---

---

---

---

---

What is missing in this Abstract?

By developing a compound ecological floating-bed system, we explore how this system works for restoring eutrophic waters and the difference of various packings. This system comprises three parts: floating-bed on the water surface (whose basis is cannae), packings in the bottom and nano-aerator in the middle. The results show that these compound ecological floating-bed systems perform better than the traditional floating-bed system when the wet time is 7 days. By

---

---

---

---

---

---

---

General statement

Elaboration on the statement

More detailed elaboration

Broader statement

---

---

---

---

---

---

---

Writing General-Specific Texts

- \* commonly used in graduate writing
- \* common structure of research paper introductions
- \* often used as introductions of longer pieces of writing (i.e. your manuscripts)
- \* move from broad to narrower statements
- \* often widen out again towards the final sentence

---

---

---

---

---

---

---

Writing is a complex sociocognitive process involving the construction of recorded messages on paper or on some other material, and, more recently, on a computer screen. <sup>2</sup>The skills needed to write range from making the appropriate graphic marks, through utilizing the resources of the chosen language, to anticipating the reactions of the intended readers. <sup>3</sup>The first skill area involves acquiring a writing system, which may be alphabetic (as in European languages) or nonalphabetic (as in many Asian languages). <sup>4</sup>The second skill area requires selecting the appropriate grammar and vocabulary to form acceptable sentences and then arranging them in paragraphs. <sup>5</sup>Third, writing involves thinking about the purpose of the text to be composed and about its possible effects on the intended readership. <sup>6</sup>One important aspect of this last feature is the choice of a suitable style. <sup>7</sup>Because of these characteristics, writing is not an innate natural ability like speaking but has to be acquired through years of training or schooling.

---

---

---

---

---

---

---

Writing General-Specific Texts

General Statements

- \* can include statements of FACT or TOPIC (true or not)

Example

In the last decade, considerable progress has been made in the science and technology of organic light-emitting diodes (OLEDs)

---

---

---

---

---

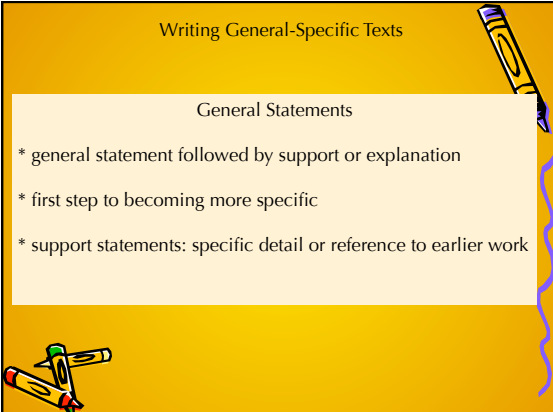
---

---

Writing General-Specific Texts

General Statements

- \* general statement followed by support or explanation
- \* first step to becoming more specific
- \* support statements: specific detail or reference to earlier work




---

---

---

---

---

---

---

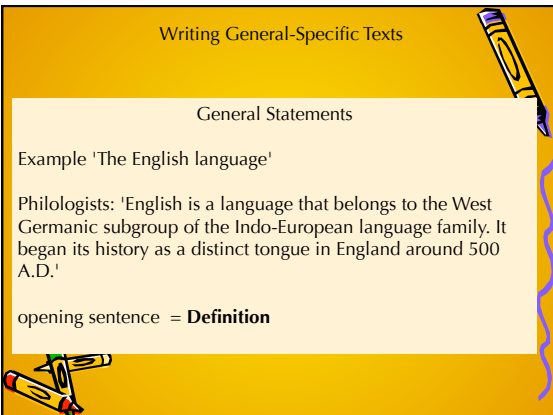
Writing General-Specific Texts

General Statements

Example 'The English language'

Philologists: 'English is a language that belongs to the West Germanic subgroup of the Indo-European language family. It began its history as a distinct tongue in England around 500 A.D.'

opening sentence = **Definition**




---

---

---

---

---

---

---

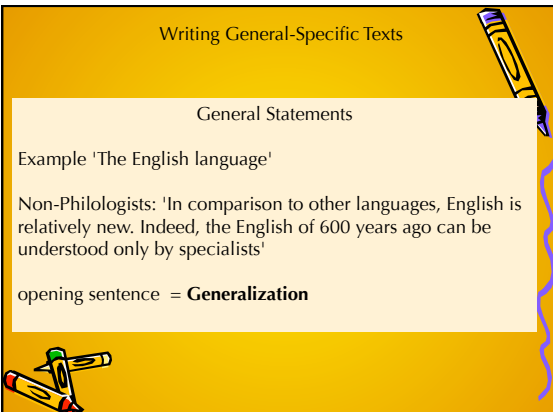
Writing General-Specific Texts

General Statements

Example 'The English language'

Non-Philologists: 'In comparison to other languages, English is relatively new. Indeed, the English of 600 years ago can be understood only by specialists'

opening sentence = **Generalization**




---

---

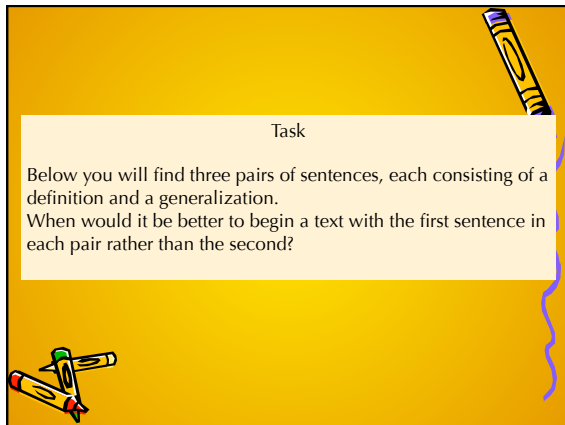
---

---

---

---

---



Task

Below you will find three pairs of sentences, each consisting of a definition and a generalization. When would it be better to begin a text with the first sentence in each pair rather than the second?

---

---

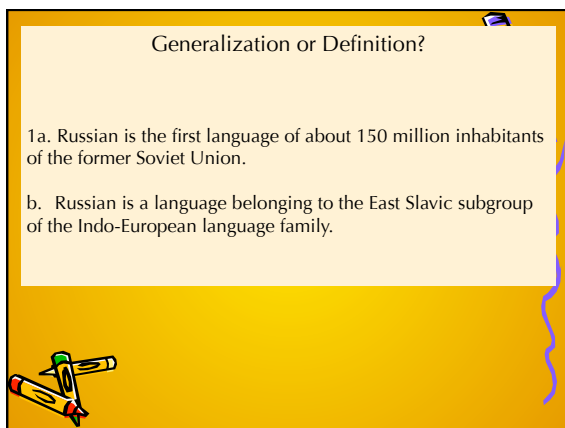
---

---

---

---

---



Generalization or Definition?

1a. Russian is the first language of about 150 million inhabitants of the former Soviet Union.

b. Russian is a language belonging to the East Slavic subgroup of the Indo-European language family.

---

---

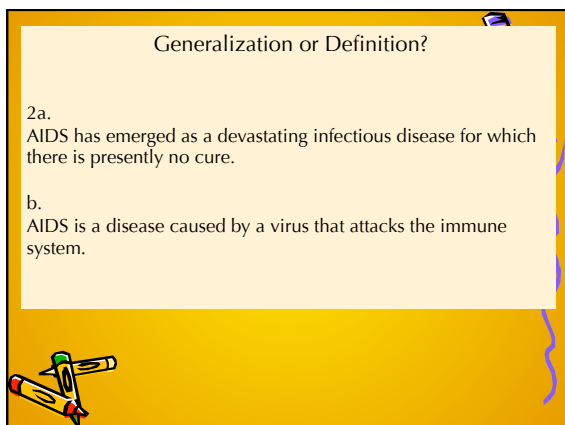
---

---

---

---

---



Generalization or Definition?

2a. AIDS has emerged as a devastating infectious disease for which there is presently no cure.

b. AIDS is a disease caused by a virus that attacks the immune system.

---

---

---

---

---


---

---

Generalization or Definition?

3a.  
A catalyst is a substance which increases the rate of a chemical reaction.

b. Catalyst technology has progressed quickly as researchers better understand the complex interactions of molecules.




---

---

---

---

---


---

---

Generalization or Definition?

4a.  
Plug-in hybrid electric vehicle (PHEV) technology is considered a potential near-term approach to addressing global warming and dependency on oil in the transportation sector as the cost, size, and weight of batteries are increasingly reduced.

b.  
A plug-in hybrid electric vehicle (PHEV) combines the propulsion capabilities of a traditional combustion engine with an electric motor.




---

---

---

---

---

---


---

Opening with (shocking) Statistics

Example:

**In the United States in 2006, 4784 pedestrians were killed in traffic accidents.** Because a large percentage of Americans use private vehicles than walk or use public transportation compared to people in many countries in the European Union...

-> very effective in generating reader interest in your text




---

---

---

---

---

---

---

Scientific Writing in English  
— 英语科研论文写作 —

OVERVIEW - Module 2  
Unit 2: General-Specific Texts

1. General statements
- 2. Definitions**
3. Language Focus: Defining and Naming
4. Language Focus: Grammar of Definitions
5. Variations in Definitions

---

---

---

---

---

---

---

---

Writing General-Specific Texts

Definitions

- \* common way of getting started in G-S texts
- \* 'hooks' from which GS paragraphs can be hung
- \* in academic writing usually full-sentence (demonstrating understanding)
- \* in textbooks just minor part of a sentence (reader unfamiliar with a term)

---

---

---

---

---

---

---

---

Writing General-Specific Texts

Ways to define in Academic Writing

1. short definitions (e.g.; i.e.; known as...; defined as...; called...)
2. sentence definitions (similar to dictionary definition)
3. Extended definitions (longer, maybe up to one paragraph)

---

---

---

---

---

---

---

---

Scientific Writing in English  
— 英语科研论文写作 —

OVERVIEW - Module 2  
Unit 2: General-Specific Texts

1. General statements
2. Definitions
- 3. Language Focus: Defining and Naming**
4. Language Focus: Grammar of Definitions
5. Variations in Definitions

---

---

---

---

---

---

---

Writing General-Specific Texts

Language of Defining

1. This new species was **named** *Ascochyta mycoparasitica*. (rare, restricted to names)
2. Any rotational velocity is usually **denoted** by a bold letter.
3. This new method is **called** activity-based costing, or ABC. (to be used with care)

---

---

---

---

---

---

---

Language of Defining

4. Another source of heat is the natural increase in temperature as the depth increase. This is **known** as the geothermal gradient. (relatively rare)
5. Shadow work may be **defined as** those activities engaged in by people outside the regular employment system. (often used, safe option)
6. The natural gas contained in coal formations is generally **referred to** as coal bed methane (used widely, for terms)

---

---

---

---

---

---

---



TASK 21: The Language of Definitions

Read through the following statements, and identify the terms or phrases that are being defined in each passage. Then write the term or phrase into the box provided below each statement.

---

---

---

---

---

---

---

Writing General-Specific Texts

Formal Sentence Definitions

- \* Dental erosion is **defined as** a progressive loss of hard dental tissues.
- \* This variant of the efficiency wage hypothesis is **known as** the shirking model.
- \* Dalle de verre, commonly **referred to** as faceted glass, is a thick, modern cast glass.

---

---

---

---

---

---

---

Formal Sentence Definitions

- \* Dental erosion is **defined as** a progressive loss of hard dental tissues.
- \* This variant of the efficiency wage hypothesis is **known as** the shirking model.
- \* Dalle de verre, commonly **referred to** as faceted glass, is a thick, modern cast glass.

-> all in **passive voice**?! Why do you think that is the case?

-> try active voice, and discuss with your neighbor what has changed

---

---

---

---

---

---

---

Writing General-Specific Texts

Formal Sentence Definitions

\* a **term** is defined as belonging to a **class or group** (superordinate, one level above)

\* class words: technique(s), method(s), process(es), device(s), system(s)

Example

*Annealing* is a metalworking **process** in which a material is subjected to elevated temperatures to cause structural and electrical changes.

? how is this different to *hammering*?

---

---

---

---

---

---

---

---

Writing General-Specific Texts

Formal Sentence Definitions

Example

A *star* is a celestial **body** that shines by itself and whose source of energy is nuclear fusion in its core.

---

---

---

---

---

---

---

---

Writing General-Specific Texts

Formal Sentence Definitions

Structure

Term	Class	Distinguishing Detail
(A) -----	is (a) -----	Wh-word -----
A solar cells	is a device	that/which converts the energy of sunlight into electric energy.

comment: both **that** and **which** are fine to use in **definitions**

---

---

---

---

---

---

---

---

Scientific Writing in English  
— 英语科研论文写作 —

OVERVIEW - Module 2  
Unit 2: General-Specific Texts

1. General statements
2. Definitions
3. Language Focus: Defining and Naming
- 4. Language Focus: Grammar of Definitions**
5. Variations in Definitions

---

---

---

---

---

---

---

---

Writing General-Specific Texts  
The Grammar of Definitions

- \*A sole proprietorship
- \*Annealing (uncountable)
- \*A star
- \*Road pricing (uncountable)

-> in definitions, indefinite article a/an used (or none for uncountable nouns)

\* indefinite article before CLASS indicates that you are classifying a term (not referring to one specific one)

---

---

---

---

---

---

---

---

Writing General-Specific Texts  
The Grammar of Definitions

\* Why not THE?

Example

- 1) A disinfectant is *an* agent capable of destroying microorganisms. (classifies)
- 2) A disinfectant is *the* agent capable of destroying microorganisms. (identifies)

\* 2) classifies, also indicates that mentioned previously other agents that are not capable of destroying MOs, indicating only THIS one can destroy MOs

---

---

---

---

---

---

---

---

Writing General-Specific Texts

The restrictive relative clause

- \* introduces distinguishing information
- \* two ways of reducing a restrictive relative:
  - simple deletion**
  - change in word form or entire word**
- \* reduced relatives not as uncommon in academic writing as often claimed
- \* reduced relatives often preferred because they are shorter

---

---

---

---

---

---

---

---

Writing General-Specific Texts

The restrictive relative clause – DELETIONS

Example 1

A wharf is a structure *that is along* a waterfront providing a place for ships to load and unload.

->

A wharf is a structure *along* a waterfront providing a place for ships to load and unload.

---

---

---

---

---

---

---

---

Writing General-Specific Texts

The restrictive relative clause – DELETIONS

Example 2

In dentistry, enamel is a hard, white inorganic material *that is the crown* of the tooth.

->

In dentistry, enamel is a hard, white inorganic material *on the crown* of the tooth.

---

---

---


---

---

---

---

---

Writing General-Specific Texts 


The restrictive relative clause – DELETIONS

Example 3

A theatre is a building *that has been specifically designed* for dramatic performances.

->

A theatre is a building specifically designed for dramatic performances.




---

---

---


---

---

---

---

---

Writing General-Specific Texts 


The restrictive relative clause – DELETIONS

Example 4

Collagen is a white, inelastic protein, *that is formed* and maintained by fibroblasts.

->

Collagen is a white, inelastic protein formed and maintained by fibroblasts.




---

---

---


---

---

---

---

---

Writing General-Specific Texts 


The restrictive relative clause – DELETIONS

Example 5

A robot is a multiprogrammable device *that/which is capable* of performing the work of a human.

->

A robot is a multiprogrammable device capable of performing the work of a human.




---

---

---


---

---

---

---

---

Writing General-Specific Texts 


The restrictive relative clause – Change in Word or Word Form

Example 1

A parliament is a national governing body *which has the highest level* of legislative power within a state.

A parliament is a national governing body *with the highest level* of legislative power within a state.

-> clause contains verb have, both relative pronoun and have can be replaced by *with*)




---

---

---


---

---

---

---

---

Writing General-Specific Texts 


The restrictive relative clause – Change in Word or Word Form

Example 2

Pollution is a form of contamination *that often results* from human activity.

-> Pollution is a form of contamination *often resulting* from human activity.

-> clause contains active state verb – verb that expresses a state or unchanging condition




---

---

---


---

---

---

---

---


Writing General-Specific Texts 

The restrictive relative clause – Change in Word or Word Form

Example 3

A moon is a natural satellite *which orbits* around a planet.

-> A moon is a natural satellite *orbiting* around a planet.




---

---

---


---

---

---

---

---

Writing General-Specific Texts 


The restrictive relative clause – Change in Word or Word Form

Example 4

Russian is a language *that belongs to* the East Slavic subgroup of the Indo-European language family.

->

Russian is a language *belonging to* the East Slavic subgroup of the Indo-European language family.




---

---

---


---

---

---

---


---

Writing General-Specific Texts 

-ing forms used in manuscripts

In molecule B, the helix conformation of X is interrupted, ***exhibiting*** a loop conformation for the segment XYZ, ***keeping*** Y away from the ABC center, ***indicating*** a switch in EFG, ***suggesting*** a conformational change during MOP.

-> use in moderation, otherwise your statements become unclear




---

---

---


---

---

---

---

---

Writing General-Specific Texts 

TASK 8 p 61

Edit the following by reducing the relative clauses where possible.

1. Aluminum is a lightweight metal that is often used for high-tension power transmission. example in class
2. Heat is a form of energy which can be transmitted through solid and liquid media by conduction.
3. A brake is a device that is capable of slowing the motion of a mechanism.
4. A dome is generally a hemispherical roof which is on top of a circular, square, or other-shaped space.

---

---

---

---

---

---

---

---

## TASK 8 p 61

Edit the following by reducing the relative clauses where possible.

5. Snow is a form of precipitation which results from the sublimation of water vapor into solid crystals at temperatures below 0°C. example in class

6. An antigen is a substance which causes the formation of antibodies, the body's natural response to foreign substances.

7. A piccolo is a small flute that is pitched an octave higher than a standard flute.

8. Membrane permeation is a separation process that involves the selective transport of gas molecules through a permeable polymeric film.

---

---

---

---

---

---

---

## Writing General-Specific Texts



The full relative clause - NO Deletion possible!

Examples (insert the appropriate prepositions)

A thermometer is an instrument ... which temperature can be measured.

Photosynthesis is a process ... which sunlight is used to manufacture carbohydrates from water and carbon dioxide.

An anhydride is a compound ... which the elements of water have been removed.




---

---

---

---

---

---

---

## Writing General-Specific Texts



Full relative clauses – whereby

\* **whereby** commonly used in formal writing instead of

by which

by means of which

through which




---

---

---


---

---

---

---



Writing General-Specific Texts 


Full relative clauses – whereby

Example

Collective bargaining is a process **through which** employers agree to discuss work-related issues with employee representatives.

->

Collective bargaining is a process **whereby** employers agree to discuss work-related issues with employee representatives.




---

---


---

---

---

---

---

Writing General-Specific Texts 

Care in Constructing Formal Definitions

\* be precise in your definitions, keeping in mind your audience

Examples

A microscope is an object...

A vowel is a sound...

Mitosis is a process...

Cancer is a...

Immunity is a ...

---

---


---

---

---

---

---

Care in Constructing Formal Definitions 

Compare the two sets:

Set 1

a) A solar cell is a device that converts the energy of sunlight into electric energy.

b) In tissue engineering, a scaffold is a structure onto which cells can be seeded and cultured.

Set 2

a) A solar cell is something that changes sunlight into electricity.

b) In tissue engineering, a scaffold is something that cells can be put on to grow them on.

---

---

---

---

---


---

---

Writing General-Specific Texts

Care in Constructing Formal Definitions

- > set 2 perfectly acceptable in spoken English or email
- > **something**: too broad and non-specific
- > **changes into/put on/grow on**: verb + preposition
- > **put on**: rather informal




---

---

---

---

---

---

---

Care in Constructing Formal Definitions

Circular definitions:

**Erosion** is a process during which the surface of the earth **erodes**.

-> Erosion is a process during which the surface of the earth is degraded by the effects of the atmosphere, weather, and human activity.

The four-wheel Antilock **Braking System** (ABS) is a **braking system** that helps provide straight, more controlled stops, while helping the driver maintain steering control.

-> The four-wheel Antilock Braking System (ABS) helps provide straight, more controlled stops, while helping the driver maintain steering control.

---

---

---

---

---

---

---

Care in Constructing Formal Definitions


\* avoid **when** and **where** in definitions

Pollution is **when** the environment becomes contaminated as a result of human activity.

-> Pollution is **a form of** environmental contamination resulting from human activity.

A fault is **where** there is a fracture in the earth's crust...

-> A fault is **a fracture in** the Earth's crust in which the rock on one side of the fracture moves in relation to the rock on the other side.




---

---

---

---

---

---

---

Scientific Writing in English  
— 英语科研论文写作 —

OVERVIEW - Module 2  
Unit 2: General-Specific Texts

1. General statements
2. Definitions
3. Language Focus: Defining and Naming
4. Language Focus: Grammar of Definitions
5. **Variations in Definitions**

---

---

---

---

---

---

---

---

Writing General-Specific Texts

**Extended** Definitions

- \* start with general, one-sentence definition
- \* continue with extending this general definition by becoming more specific

---

---

---

---

---

---

---

---

**Extended** Definitions

- \* may also contain information regarding operating principles or causes and effects

Example:

Lateralization is a developmental process during which the two sides of the brain become specialized for different functions. As a child develops, the two sides of the brain become asymmetric in that each side controls different abilities. Language, for instance, is controlled by the left side of the brain, and certain types of pattern recognition by the right. However, there is some disagreement as to when this specialization is complete. Some researchers believe the process is not complete until puberty, while others maintain that the brain is lateralized by age five.

---

---

---


---

---

---

---

---

Writing General-Specific Texts 

**Competing Definitions**

\* sometimes, definition of a term or concept not fixed

Example 1

Preeclampsia has been defined as a pregnant condition characterized by arterial hypertension, proteinuria and edema during the second half of pregnancy. **Although** this definition appears simple and includes the main signs, there is a **wide diversity** in the use of the term in clinical and epidemiological studies, leading to difficulties in comparing research outcomes.

---

---


---

---

---

---

---

Writing General-Specific Texts 

**Competing Definitions**

\* sometimes, definition of a term or concept not fixed

Example 2

For centuries scholars have attempted to define, explain, and theorize nationalism. **Despite** their efforts, it appears there is little agreement on the definition of this concept among researchers.

---

---


---

---

---

---

---

Writing General-Specific Texts 

**Competing Definitions**

\* useful skeletal phrases for presenting chosen definitions

**While** debate exists regarding a precise definition of XYZ, the stance adopted in this paper is ...

For the purpose of **this paper**, ABC refers to/is defined as/is considered to be XYZ.

**Here**, we define ABC as ...XYZ.

**In this paper**, we adopted [author's] definition of ...ABC.

**This paper** follows [author's] definition of...XYZ.

---

---


---

---

---

---


---

Writing General-Specific Texts 

**Contrastive Definitions**

\* comparing between two different terms, concepts, results

- a) optical and electron microscope
- b) star and planet
- c) assay 1 and assay 2
- d) disease A and disease B
- e) our result and previous result




---

---


---

---

---

---


---

Writing General-Specific Texts 

**Contrastive Definitions**

Example (patents versus copyrights)

1) A patent, in law, is a right that grants an inventor sole rights to the production, use, or sale of an innovation or process for a limited period of time. 2) The inventor is guaranteed the possibility to earn profit for a reasonable period, after which the public is guaranteed eventual free use. 3) **On the other hand**, a copyright is a form of protection which grants an originator of artistic work exclusive use of the artistic creation for a specific period of time. 4) Copyrights are issued to authors, playwrights, composers, artists, and publishers, who then have control over publication, sale, and production of their creations for a period of time.




---

---


---

---

---

---

---

Writing General-Specific Texts 

**Contrastive Definitions**


one the one hand ... 一方面

on the other hand ... 另一方面

-> in Chinese, no contrast required

On the one hand, he is very rich. On the other hand, he is also well-mannered.

BUT: in English, used for contrast

 (On the one hand), he is very rich. On the other hand, he is rather old.

---

---

---

---

---

---

---

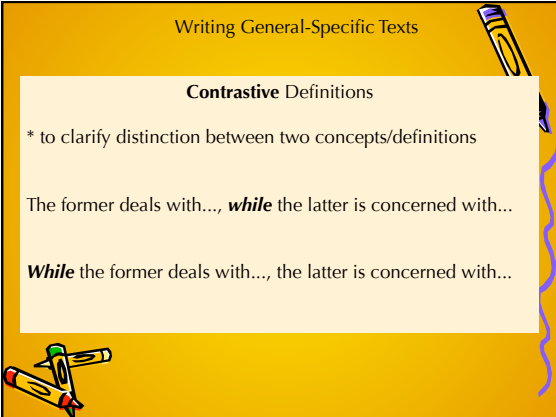
Writing General-Specific Texts

**Contrastive Definitions**

\* to clarify distinction between two concepts/definitions

The former deals with..., **while** the latter is concerned with...

**While** the former deals with..., the latter is concerned with...




---

---

---

---

---

---

---

---

Writing General-Specific Texts

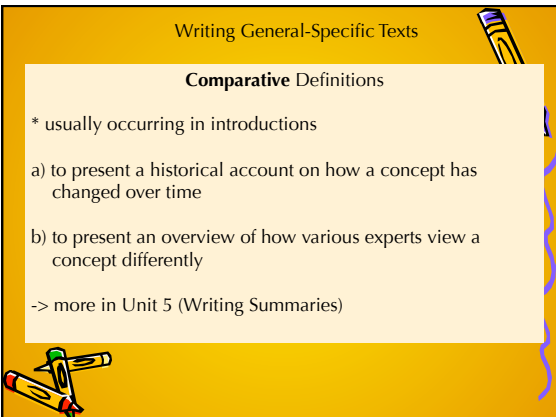
**Comparative Definitions**

\* usually occurring in introductions

a) to present a historical account on how a concept has changed over time

b) to present an overview of how various experts view a concept differently

-> more in Unit 5 (Writing Summaries)




---

---

---

---

---

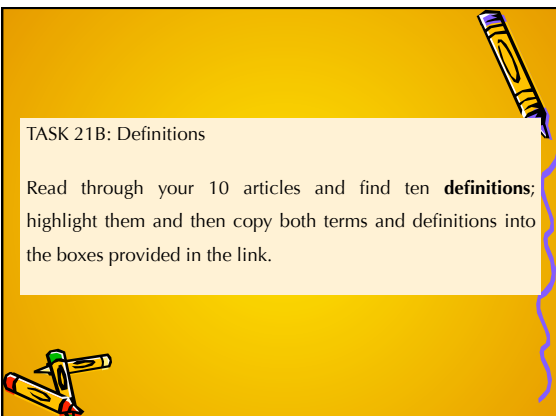
---

---

---

TASK 21B: Definitions

Read through your 10 articles and find ten **definitions**; highlight them and then copy both terms and definitions into the boxes provided in the link.




---

---

---

---

---

---

---

---



---

---

---

---

---

---

---