Chapter 02: English grammar in scientific context:

1-English Tenses in scientific context:

In scientific style, tenses denote the time of action and show exactly when the work is done. English tenses can be:

Table 01. English tenses in scientific context.

Tense	Past	Present	Future
Simple	Past habit or completed action. (Yesterday last, ago, in the past) **Examples**: 1-Our <u>last</u> experiment <u>demonstrated</u> that light intensity affected growth. 2-The bacteria <u>grew</u> quickly in the nutrient medium.	Habit, general truth (Today, every, usually…etc) **Examples:** 1-Water <u>boils</u> at 100°C. 2-DNA carri<u>es</u> genetic information.	Action that hasn't taken place yet. (Next, in the future, tomorrow) **Examples:** 1-Pollution <u>will destroy</u> our planet. 2-Under heat, the solution <u>will change</u> color.
Continuous	Action in progress at a specific moment in the past**.** **Examples:** 1-The plant <u>was growing</u> slowly until the start of rainfall days. 2-Corona virus <u>was spreading</u> faster among citizens.	Action in progress in the present moment **Examples:** 1-Humanity <u>is facing</u> a 6th phase of extinction. 2- Climate change <u>is altering</u> the distribution of insects.	Action that will be in progress in a specific time of the future. **Examples:** 1**-**The scientific event <u>will be happening</u> during the next summer. 2**-** By the end of winter, the birds <u>will be returning</u> back to the south.
Perfect	Action completed before another past action. **Examples:** 1- The lab technician <u>had prepared</u> all the materials before the students <u>arrived.</u> 2- The ants <u>had stored</u> reserves before the winter <u>started.</u>	Connecting past actions to the present. **Examples:** 1**-** Pollution levels <u>have increased</u> since the industrial revolution. 2- Researchers <u>have discovered</u> a new treatment for anemia.	Action that will be completed before a specific time in the future **Examples:** 1- By spring, the plant <u>will have bloomed.</u> 2- The bacteria <u>will have grown</u> after 48 hours.

2-Active voice and passive voice in scientific style:

In grammar, "Voice" means the form of verb by which the relation of the subject to the action implied is indicated. It is the form of the verb which indicates whether the subject does the work or something has been done to it. There are two types of voices in English language:

❖ **Active Voice**:

In active voice, the subject performs the action, making the message direct and engaging.

Example: The researcher <u>conducted</u> the experiment.

❖ **Passive Voice**:

Passive voice shifts the focus to the object or recipient of the action, often obscuring the subject. For

instance. **Example**: The experiment was conducted by the researcher.

2-1- Principal rules for voice change:

- **Rule 01:**

The object of the verb in the Active Voice becomes the subject of the verb in the passive voice.

- **Rule 02:**

The subject of the verb in the Active voice becomes the object in the passive voice. (Generally preceded by the preposition "**by**")

- **Rule 03:**

The main verb is changed into the Past Participle form and it is preceded by the correct form of the verb, "**to be**" in passive voice.

- **Rule 04:**

There are some verbs with the objects. In such cases either of the objects can be changed into the subject and the other is retained as an object. The object is called Retained Object.

Example: The teacher gave the course to the 3rd level students.

The 3rd level students were given the course by the teacher.

2-2-How to Switch from Passive to Active Voice:

While passive voice is used in scientific writing for emphasizing and for unknown subjects, active voice makes sentences more direct and clearer. It generally prevails in scientific writing for clarity and precision, specific situations. It is so more correct to change passive phrases into active style and for this we have to:

- ❖ **Identify** the subject and the object in the sentence.

  Example: The effect of temperature on enzyme activity was measured.

  "temperature" is the subject, and "enzyme activity" is the object.

- ❖ **Determine** who or what is performing the action.

  "temperature" performs the action on "enzyme activity."

- ❖ **Restructure** the sentence to emphasize the subject as the action doer and the object as the action receiver.

  "We measured the effect of temperature on enzyme activity."

- ❖ **Utilize** active verbs that precisely describe the action.

  "measured" accurately conveys the researcher's action.

- ❖ **Revise** the sentence as needed to ensure clarity and conciseness in order to deliver a clear and concise message.

  "We measured the effect of temperature on enzyme activity"

Examples:

Active: "The virus infected the cells."
Passive: "The cells were infected by the virus."

Active: "The plant absorbed water through its roots."
Passive: "Water was absorbed by the plant through its roots."

Active: "Hydroxyurea had reduced the frequency of painful episodes."
Passive: "The frequency of painful episodes had been reduced by taking hydroxyurea."

Active: "Bacteria was producing the enzyme since its maturation"
Passive: "The enzyme was being produced by bacteria since its maturation"

3-Comparative and superlative in scientific field:

Adjectives are words that describe, identify, or quantify nouns and pronouns. They help specify our writing by offering more details about nouns and pronouns.

- **Comparative Adjectives:**

Comparative adjectives are used to compare differences between the two objects they modify (*larger, smaller, faster, higher*). They are used in sentences where two nouns are compared, in this pattern:

Noun (subject) + verb + comparative adjective + *than* + noun (object).

Examples: 1) Everest Mountain is *higher* than Makalu peak.

2) Science is *more difficult* than maths.

- **Superlative Adjectives:**

Superlative adjectives are used to compare three or more situations. They are used to describe an object which is at the upper or lower limit of a quality (*the tallest, the smallest, the fastest, the highest*), in sentences where a subject is compared to a group of objects.

Noun (subject) + verb + the + superlative adjective + noun (object).

Examples: 1) Everest is *the highest mountain* in the world.

2) English is *the easiest* language.

3-1-Regular comparative and superlative adjectives:

3-1-1- Concept of syllable:

A unit of pronunciation having one vowel sound, with or without surrounding consonants, forming the whole or a part of a word (noun or adjective).

Examples: 1) Adjectives with **one syllable:** big, cold, hot, long, nice, old, tall.

      2) Adjectives with **two syllables:** peaceful, thoughtful, perfect, Heavy.

      3) Adjectives with **more than two syllables:** expensive, logical, aggressive, dangerous.

❖ **One syllable adjectives** :

Add *-er* for the comparative and *-est* for the superlative. If the adjective has a consonant + single vowel + consonant spelling, the final consonant must be doubled before adding the ending.

Adjective	Comparative	Superlative
Tall	Tall**er**	Tall**est**
Fast	Fast**er**	Fast**est**
Big	Bigg**er**	Bigg**est**
High	High**er**	High**est**

❖ **Two syllables' adjectives:**

Adjectives with two syllables can form the comparative either by adding *-er* or by preceding the adjective with *more*. These adjectives form the superlative either by adding *-est* or by preceding the adjective with *most*. For adjectives ending in *y*, change the y to an i before adding the ending.

Adjective	Comparative	Superlative
Narrow	Narrower	Narrowest
Heavy	Heavier	Heaviest
Cold	Colder	Coldest
Carefully	More Carefully	Most Carefully

❖ **More than two syllables' adjectives:**

Adjectives with three or more syllables form the comparative by putting *more* in front of the adjective, and the superlative by putting *most* in front.

Adjective	Comparative	Superlative
Important	More Important	Most Important
Dangerous	More Dangerous	Most Dangerous
Delicate	More Delicate	Most Delicate

3-2-Irregular comparatives and superlatives:

These very common adjectives have completely irregular comparative and superlative forms.

Adjective	Comparative	Superlative
Good	Better	Best
Bad	Worse	Worst
Little	Less	Least
Much	More	Most
Far	Further	Furthest

4-Conditional sentences in scientific writing:

Conditional sentences have two parts or clauses that give a condition in the dependent clause and a result in the independent clause. The condition clause usually contains an **if statement**. There are several different forms of conditional sentences that allow the writer to express various meanings using different tenses.

4-1-Conditional types:

There are Four type of conditional sentences:

➢ **Type 00:**

The zero conditional uses the present tense in both clauses and is used to talk about something that is always or generally true (Scientific facts). The present tense signifies that these actions are both possible and typical.

> **Form: *If* + <u>Simple Present</u> >>> <u>Simple Present</u>**

Examples: 1) If you <u>heat</u> ice, it <u>melts</u>

   2) If you <u>cross</u> an international date line, the time <u>changes</u>.

➢ **Type 01:**

The first conditional uses the present tense in the if clause and the future tense in the result clause. This form is used to talk about something that is a probable future result of a condition.

> **Form: *If* + <u>Simple Present</u> >>> Simple <u>Future (= will + bare infinitive)</u>**

Examples: 1) If clean energy <u>replaces</u> fossil fuels, the plant <u>will be</u> saved.

   2) If temperatures <u>continue</u> to raise, many species <u>will disappear.</u>

➢ **Type 02**

The second conditional uses the past tense in the if clause and a modal and base verb in the result clause.
This form is used to talk about a hypothetical situation that cannot happen or is unlikely to happen.

Form: *If* + **Simple Past >>> would + bare infinitive)**

Examples: 1) If i studied medicine, i would be a good doctor.

　　　　2) If industrial revolution did not occur, the greenhouse effect would not happen.

➢ **Type 03:**

The third conditional uses the past perfect in the if clause and a modal and present perfect in the result clause.
This form is used to talk about a hypothetical situation in the past that did not happen typically with an outcome
that did not happen and is perhaps the opposite of what did happen.

Form: *If* + **Past Perfect >>> would + have + Past Participle)**

Examples: 1) If you had studied enough, you would have passed your exams.

　　　　2) If i hadn't learnt biology, i wouldn't have got this job.