وزارة التعليم العالي والبحث العلمي

République Algérienne Démocratique et Populaire
Ministère de l'Enseignement Supérieur et de la Recherche Scientifique

Centre Universitaire Abd El Hafid Boussouf –Mila

Institut des Sciences de la nature et de la vie

Département d'écologie

Polycopié pédagogique

Cours d'anglais scientifique

Destiné aux étudiants de Master 1 Ecologie (Protection des écosystèmes)

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Année universitaire 2025-2026

الجمهورية الجزائرية الديمقراطية الشعبية

République Algérienne Démocratique et Populaire

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المركز الجامعي عبد الحفيظ بوالصوف ميلة

Centre Universitaire AbdelhafidBoussouf Mila

معهد علوم الطبيعة والحياة

nstitut des sciences de la nature et de la vie

قسم علوم البيئة والمحيط

épartement des sciences de l'écologie et l'environnement

FICHE DE MATIERE (SYLLABUS)

Licence/ Master :Master 1

Matière : Anglais scientifique

Domaine : Ecologie

Filière : Protection des écosystèmes

Semestre :02, Année Universitaire :2023/2024.

Coefficient : 02

Crédit : 02

Unité d'enseignement : Découverte

Volume Horaire Hebdomadaire Total : 45 h

Cours (1 : 30h)

Travaux Dirigés (1 : 30h)

Travaux Pratiques (00h)

Langue d'enseignement :Anglais

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Programme détaillé (chapitres et leurs titres) :

Chapter 01: Introduction to Ecological Concepts

Chapter 02: Basic English sentence patterns

Chapter 03: Scientific English writing and vulgarization

Chapter 04: Examples for Oral and written scientific communications

Contrôle	Pondération (%)
Examen Final	60
Travaux Dirigés	40
Travaux Pratiques	00
Total	**100**

Travaux Dirigés 100 % :

50% Exposés.

50% Micro-interrogations.

00.% Autres.

RéférencesBibliographiques:

1.BALDASSARE G.A & BOLEN E.G (2006): Waterfowl ecology and management (Second Edition). Krieger Publishing Company (Malabar, Florida). 567p: 29-33p; 325-330p.

2.BRONMARK C. & HANSSON L.A. (1998): Biology of habitats: The Biology of Lakes and Ponds. Oxford University Press, 200p.

3.HARREMOES H., ARVIN L.C.J, (1995): Wastewater Treatment: Biological and chemical processes, second edition.

4.SAVIGNY D. & WIJEYARATNE P. (1995): GIS for health and the environment. Edition. ISBN. 172p.

Lien de support pédagogique (e-learning université Mila)

https://elearning.centre-univ-mila.dz/a2025/course/view.php?id=2671

Signature de l'enseignant responsable

Avant-propos

L'anglais scientifique constitue aujourd'hui un outil incontournable pour les étudiants et les chercheurs en sciences biologiques. La majorité des publications, des conférences internationales et des sources d'information spécialisées sont rédigées en anglais, ce qui en fait la langue de référence pour la communication scientifique.

Ce module a pour objectif principal de familiariser les étudiants de Master 1 en Écologie (Protection des écosystèmes) avec le vocabulaire spécifique, les structures linguistiques et les techniques de rédaction propres aux textes scientifiques. Il vise également à développer les compétences de compréhension et d'expression écrite et orale nécessaires pour lire, analyser et produire des articles scientifiques, des rapports techniques, ainsi que pour présenter des travaux de recherche dans un cadre académique ou professionnel.

L'accent sera mis sur l'acquisition d'une méthodologie adaptée à la lecture critique d'articles, la rédaction de résumés et de synthèses, ainsi que la présentation claire et précise des résultats scientifiques. En outre, ce module contribuera à préparer les étudiants à leur future insertion dans le monde de la recherche et de l'expertise environnementale, où la maîtrise de l'anglais scientifique représente un atout majeur.

Le contenu de ce module est fragmenté en 4 chapitres principaux, le 1er consiste a une révision globale des différents concepts écologiques étudiés par les étudiants durant les années précédentes, le 2ème est une introduction à la rédaction littéraire en anglais, le 3ème chapitre fait appel à des concepts scientifiques dans le domaine biologique et le 4ème chapitre présente des exemples de communications orales et écrites en anglais.

Nous espérons que ce module constituera pour les étudiants une passerelle vers une meilleure intégration dans la communauté scientifique internationale et qu'il encouragera leur autonomie dans l'utilisation de l'anglais comme langue de travail et de communication.

Summary:

Tables list :

Figures list :

I-Introduction:

A scientific English course for Master 1 students' degree in Ecology and environment can be described as a specialized training program designed to strengthen students' ability to understand, produce, and communicate scientific content in English within their field. The course usually focuses on developing academic writing skills for research articles, reports, and theses, as well as oral communication skills for conferences, seminars, and international collaborations.

The content of this course is divided into four main chapters. The first chapter is an introduction to ecology concepts, which is a flash back to the principal ecological concepts studied by the students in the 3rd level and which provides an overview of how living organisms interact with one another and with their physical environment at multiple levels of organization, from individuals to the biosphere. It explains the fundamental elements of ecosystems, including habitats, niches, biotic and abiotic factors, as well as the processes that regulate ecological systems such as energy flow, food webs, and nutrient cycles. On a global scale, the chapter underlines the crucial role of ecology in understanding biodiversity, evaluating the impacts of human activities like climate change and deforestation, and guiding sustainable practices to preserve ecosystems and ensure the balance of life on Earth.

The second chapter summarizes the principal English sentences pattern which globally introduces learners to the core structure of English sentences, emphasizing the importance of word order and the relationship between the subject, verb, and other elements. The section would also highlight different sentence types, including affirmative, negative, interrogative, imperative, and exclamatory forms, showing how meaning and function change with structure. Finally, it would include clear examples and practice activities to help learners construct sentences correctly and build a strong foundation in English grammar.

The third chapter of this course is about Scientific English writing, what would explain the difference between specialized scientific communication and simplified popularization for a wider audience. It would describe the characteristics of scientific writing, such as precision, clarity, objectivity, use of technical vocabulary, formal structure, and referencing systems, often intended for researchers, academics, or professionals. It would also cover the process of vulgarization which involves translating complex scientific ideas into accessible language by simplifying terminology, using analogies, shorter sentences, and concrete examples to reach non-specialist readers. The section would highlight the importance of adapting tone, vocabulary, and style depending on the audience, while maintaining accuracy and avoiding distortion of meaning. Finally, it indicates the principal steps for writing and analyzing a scientific article.

The Fourth and the last chapter provides examples about oral and written communications in scientific field. Examples as how to prepare a professional CV, how to write and send a professional email; How to prepare and present a scientific conference and how to conduct a job interview, are chosen to prepare a student in Master 1 degree to face professional life and its various procedures at the end of the academic journey.

Chapter 01

Introduction to Ecological concepts

II-Chapter 01: Introduction to Ecological concepts:

1. Organization of living beings:

Levels of organization in ecology help scientists generally study the anthropogenic impact**,** energy flow and changes in population dynamics. Natural organisms can be studied at small or large levels:

- **Organism:** We focus at this level on the relationship of an individual organism with its abiotic environment (temperature, moisture, light, soil etc….)
- **Population:** A group of individuals of the same species in a specific area; ecologists are interested in the biotic and abiotic factors that affect a population's size and distribution.
- **Community:** It's about populations of different species in an area, with a focus on community structure, composition and the biotic interactions between these groups, such as predation and competition.
- **Ecosystem:** A community together with its function, which is the pools and fluxes of energy and matter within and between biotic and abiotic factors.
- **Ecoregion (Landscape):** Recurring patterns of ecosystems, associated with characteristic combinations of soil and landform. Ecosystems within an ecoregion are more similar to each other than to ecosystems elsewhere.
- **Biosphere:** It represents all of the Earth's organisms interacting with each other and the global environment.

1.2. Ecological concepts:

1.2.1. Definition of Ecology:

The word **ecology** is derived from the greek "oikos" meaning house and "logos" meaning study (Study of the natural house of species). The word ecology is of recent origin having been first proposed by the German biologist **ERNST HAECKEL** in **1869;** as the study of organisms, populations, and communities, as they relate to one another and interact in the ecosystems they comprise.

1.2.1.1. Types of Ecology:

According to the group of organisms to be studied, there are three types of Ecology:

- **Autecology or species ecology:**

It deals with the study of an individual species of organisms in its population. The ecologists study the behavior and adaptations of a particular species to the environmental condition at every stage of that individual's life cycle.

- **Demecology or Ecology of population:**

It includes the study of populations of different species with concern to birth rate, death rate, different factors affecting number, growth, and sizes of populations.

- **Synecology or Ecology of communities:**

It deals with the study of communities and Ecosystems, their composition, their behavior and their relation with the environment.

1.2.2. Factors affecting an Ecosystem:

The structure of an ecosystem explains the relationship between the major abiotic and biotic components:

- Biotic (living) components.

- Abiotic (non-living) components.

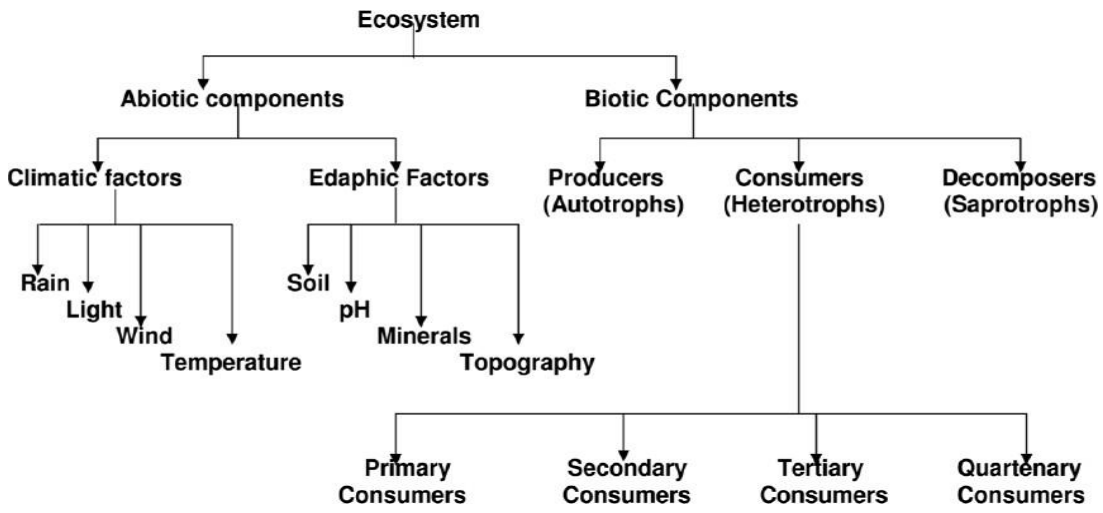

Figure 01. Biotic and Abiotic factors affecting an ecosystem.

1.2.3. Energy Flow in Ecosystems:

Energy flows from the sun through ecosystems and from one organism to another. This energy cycles through ecosystems from producers to consumers and back into the nutrient pool through decomposers. Trophic levels describe the feeding levels of organisms.

1.2.3.1.Concept of food chain:

The food chain is a linear sequence of organisms where nutrients and energy are transferred from one organism to another organism. It begins with the producer, follows the chain with the consumers and ends with the decomposer organisms. After understanding the food chain, we realize how one organism is dependent upon another one for survival. Every food chain is consisted of:

- **Producers**

Producers are plants that produce, or create, their own food by using light energy from the sun, carbon dioxide from the air, and water from the soil. The process that makes them Autotrophs is called photosynthesis.

- **Consumers**

Animals are consumers. They cannot produce their own food, so they get their nutriments and their energy by consuming (eating) other plants and animals. There are 3 groups of consumers: carnivores, herbivores, and omnivores.

- **Decomposers**

Bacteria and fungi are decomposers. They eat dead plants and animals, break them down and decompose or dispose of them. When that happens, they release nutrients and minerals back into the soil, which are then used by plants during photosynthesis.

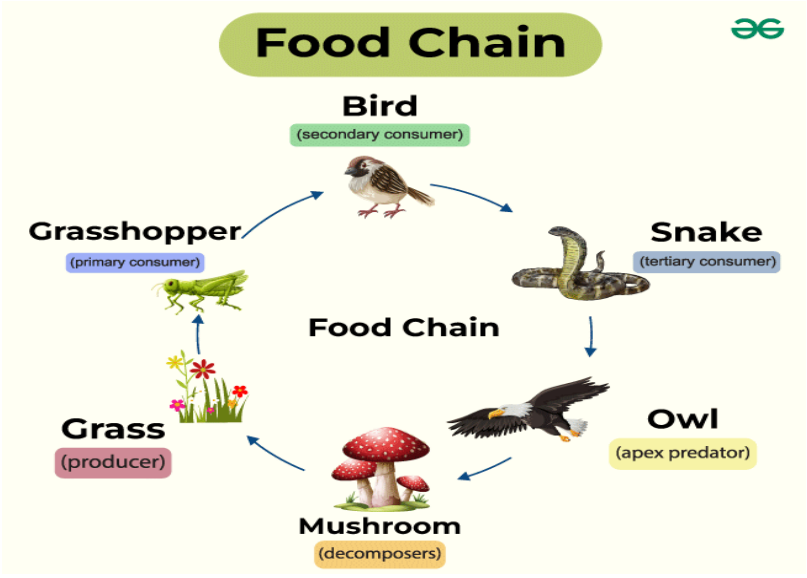

Figure 02. Food chain principal elements

1.2.3.2.Concept of Food Webs:

A food web is made up of interconnected food chains. Most communities include various populations of producer organisms which are eaten by any number of consumer populations. The green crab, for example, is a consumer as well as a decomposer.

1.2.3.3.Concept of Productivity in Ecology:

In ecology, productivity is the rate at which energy is added to organisms in the form of biomass. It is simply the amount of matter that's stored in the bodies of a group of organisms. Productivity can take units of either energy or biomass. There are two types of productivity in food chains:

- **Primary productivity:**

Primary production in biology is different compared to primary productivity; it's the amount of organic biomass produced in a given frame of time. Primary production is the amount while primary productivity is the rate.

- **Secondary productivity**

It stands for the production of biomass from organic matter. The main conversion is of one form of organic molecules to some other form of organic molecules. It is performed by the "heterotrophs*"* production in the ecosystem; hence the productivity of human beings, and other animals.

1.2.4. Energy pyramids

Ecological Pyramid is a graphical depiction which is meant to illustrate the relationship between different living organisms at different level in an ecosystem. Energy pyramid consists of horizontal bars showing specific trophic levels which are arranged sequentially from primary producer level through herbivores, and carnivores. The number, biomass and energy of organisms gradually decrease with each step from the producer level to consumer level and the diagrammatic representation takes a pyramid shape according to the following cases:

- **Pyramid of Numbers**

Pyramids of number allow us to compare the number of organisms present in each trophic level at a particular time. They often show a reduction in number of organisms as you move along the food chain.

- **Pyramid of Biomass**

Biomass is a measure of the total amount of living material present. Pyramid of biomass allows us to compare the mass of organisms present in each trophic level at a particular time. Biomass is a better way to measure the amount of living material in each trophic level if the organisms have different sizes.

- **Pyramid of Energy**

Pyramids of energy permit us to compare the amount of energy passing through each trophic level over a period of time. The energy value is calculated over the whole year, which allows for seasonal variations in all populations.

1-2-4-Ecological interactions between living beings:

1.2.4.1.Concept of interaction:

Living beings' interaction is the effect that a pair of organisms living together in a community have on each other. This enables the balance of life in a specific community and other organisms to benefit from efforts and activities of every element in the ecosystem. Interactions can be:

- **Intraspecific interactions:**

Interactions between individuals of the same species. They can be harmful, if they provoke competition for natural resources (Food, light, space) or reproduction. They can also be beneficial, if they favor cooperation between individuals:

- **Interspecific competition**

A competition between members of the same species. Many animals have developed complex behaviors to minimize the potential impact of direct competition. For instance, the maintenance of dominance hierarchies and territories through behavioral displays reduces fighting and the risk of injury.

- **Group effect**

Groups can better defend themselves together, modify their environment and take down larger preys and more efficiently raise offspring. This positive effect provides the benefits of co-operative behaviors often outweigh the cost of increased competition.

- **Mass Effect**

It occurs when the environment is overpopulated and causes exacerbated competition with harmful consequences for individuals. This negative effect results in disturbances of populations, such as a drop in fertility rate, a reduction in the birth level, and an increase in mortality frequency.

- **Interspecific interactions:**

Interactions which are established between individuals of different species. They can be negative, neutral or positive relationships:

2. Biodiversity Concepts:

2.1. Definition of biodiversity:

Biodiversity is the variety of different forms of life on earth, including the different plants, animals, micro-organisms, the

genes they contain and the ecosystem they form within an area, biome or planet. Relative to the range of habitats, biotic communities and ecological processes in the biosphere, biodiversity is vital in number of ways for living beings, and this by providing essential food, clean water, fuel, shelter, timber and medicine. During the Convention of biological diversity (Rio De Janerio, Brazil) in 1992 and by the participation of 154 countries, the biodiversity was also defined as the variability among living organisms from all sources including inter alia, terrestrial, marine and other ecosystems besides the ecological complexes of which diversity variety includes diversity in species, between species and in ecosystems.

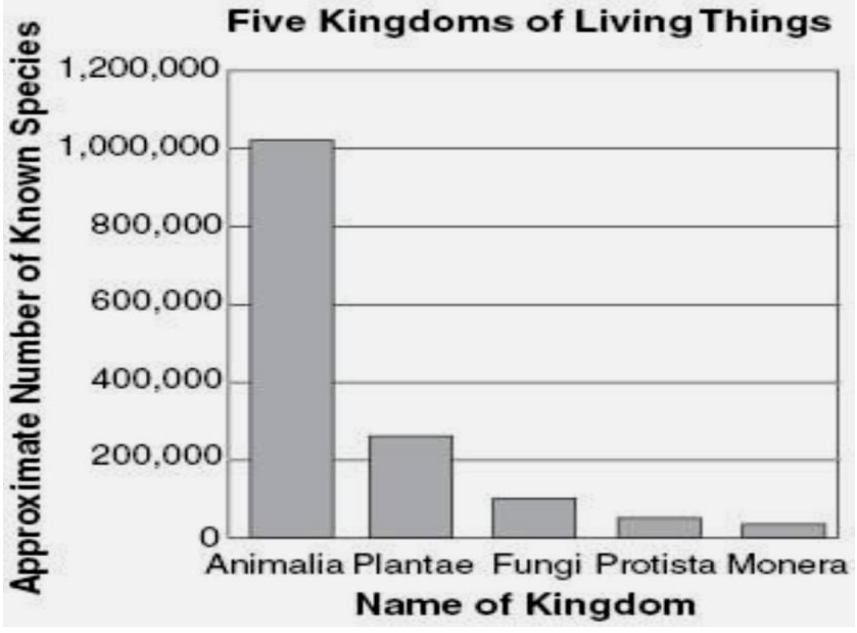

Figure 03. Biological biodiversity distribution on earth

2.2. Biodiversity types:

There are three levels of biodiversity namely; genetic diversity, species diversity and community or ecosystem diversity.

- **Genetic diversity:**

It describes the variation in number and types of genes and chromosomes present in different species. It also represents the genetic information contained in all of the individual plants, animals and microorganisms occurring within populations of species. Simply it is the variation of genes within organisms and populations. The genetic variation arises by mutation in AND sequences which helps the evolution of new species; the adaptation to changes in environmental conditions; and the improvement in agricultural productivity.

- **Species diversity:**

It indicates the variety in number and richness of different species within a region. This diversity refers to the total count of species in a defined area (Species Abundance**)** and to the relative numbers among species (Rate). The concept of species richness doesn't only inform about the extent of biodiversity in a specific site, but also provides means for comparing different ecological areas. If all the species have the same equal abundance, this means that variation is high in diversity, however if one species represents a high abundance comparing to other populations, that indicates a low diversity level (Concept of dominance).

- **Ecosystem diversity:**

This relates to the variety of habitats, biotic communities and ecological processes in the biosphere. It describes the assemblage and interaction of species living together at a physical environment in a given area. The ecosystem

diversity is due to variability of niches, trophic levels and different ecological processes including nutrient cycling, food webs, energy flow and various related biotic interactions. The terrestrial biodiversity of our planet tends to be highest near the equator, which is the result of the warm climate and high primary productivity, while the Marine variability tends to be highest along coasts in the western pacific, and the mid-latitudinal band of oceans, where sea surface temperature is the highest.

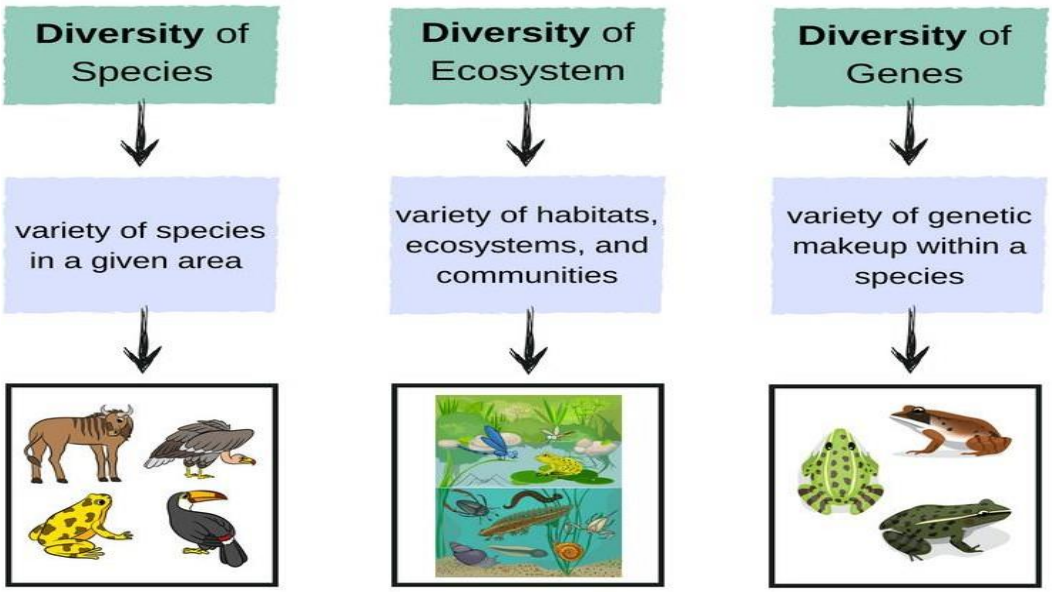

Figure 04. Ecological biodiversity types

2.3.Biodiversity loss:

It refers to the decline or disappearance of biological diversity. Biodiversity loss happens when various species disappear completely from earth (extinction), or when there is a decrease in species populations in a specific area, what globally leads to reduction in biological diversity.

In 2019, the United Nations (UN), in collaboration with the intergovernmental science-policy platform on biodiversity and ecosystem services (IPBES) report that out of a total of eight millions, one million species are in danger of extinction.

2.4.Concept of species extinction:

A species is said to be extinct when it no longer lives anywhere on the planet. Extinction occurs when the last members of a species die because they cannot acquire food**,** water, shelter, and necessary space to survive. The decrease in population size that typically precedes extinction can be due to environmental change, predation, diseases or extreme climatic events.

2.4.1. Causes of biodiversity loss:

Biodiversity loss is the result of multiple causes:

- Destruction of natural habitats (deforestation, agriculture, intensive mono-culture, urbanization).
- Direct exploitation such as hunting and over-fishing.
- Climate change.

- Pollution (Industrial emissions, organic fertilizers and domestic residues).
- Invasive species and genetic pollution.
- Wildfire, floods, and volcanic eruptions.
- Ocean acidification.

2.4.2. Consequences of biodiversity loss:

The principal consequences of biodiversity loss are:

- Extinction of species
- Loss of ecosystems stability and decline in ecosystems services (soil, water and food chains)
- Proliferation of pests (damages in crops productivity)
- Increase in CO_2 emissions.
- Increase in zoonotic disease transmission to humans

3. Solution for biodiversity loses:

3.1. Concept of biodiversity conservation:

In ecology, conservation is the protection, the preservation, the management, and the restoration of wildlife and natural resources such as forests and water. Through conservation of biodiversity, survival of many species and habitats can be ensured. There are two types of conservation for natural biodiversity:

- **In-situ conservation**

Conservation, recovery and maintenance of ecosystems, populations and species in their natural habitats or the surroundings where they have developed their distinctive properties. It means that to save a tiger, we have to save the whole forest. The protected areas where in-situ conservation takes place are:

- National Parks
- Wildlife sanctuaries
- Biosphere reserves
- Sacred groves.

- **Ex-situ conservation**

Conservation of the components of biological diversity outside their natural habitats. In ex-situ conservation, threatened animals and plants are taken out of their natural habitat and placed in a unique and ideal setting where they can be protected and given special care. This could be realized in:

- Plant seed banks
- Botanical gardens
- Zoological parks
- Field gene banks
- Invitro methods

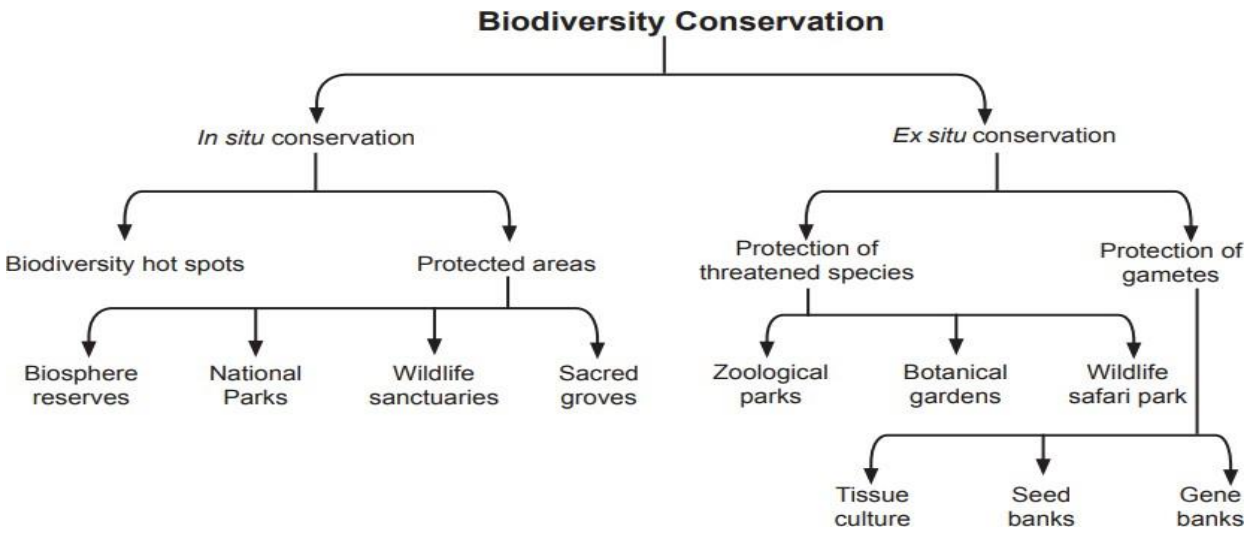

Figure 05. In-situ and Ex-situ conservation processes

3.2.Concept of sustainable development:

"Sustainable development is the development that responses to all human needs (people) without compromising the ability of future generation to meet their own needs". In other words, it is improving the quality of life of the present generation without excessive use or abuse of natural resources, so that they can be preserved for the next generation.

Figure 06. Sustainable development principal axes

3.2.1. Main axes of sustainable development:

The principal axes of sustainable development are: economic development, social development and environmental protection:

- **Economic growth**

Building a strong and competitive economy, by ensuring the availability of sufficient land ecosystems and natural resources to support growth and modern coordinating development requirements.

- **Environmental protection**

Contributing to protecting and enhancing our natural and developed environment, while helping to improve biodiversity, use natural resources wisely, minimizing waste and pollution, adapting and helping to decrease climate change, and including a global shift to low-carbon economy.

- **Social inclusion**

Supporting strong, active and healthy communities by providing the supply of human needs as well as protecting the future generations rights (Creating a high-quality of development, with accessible local services as health, social and cultural well-being).

3.3. Habitats Restoration:

It is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed to reflect its intrinsic values and to provide goods and services that people value. The aim is to return the ecosystem to the condition it would have been in if degradation had not occurred, accounting for anticipated change. Restoration ecology is the scientific study of repairing disturbed ecosystems through human intervention.

3.3.1. Ecological restoration Goals:

Many restoration projects aim to establish ecosystems composed of a native species; other projects attempt to restore, improve, or create particular ecosystem functions, such as pollination or erosion control. Restoration projects include:

- **Revegetation**

  The establishment of vegetation on sites where it has been previously lost, often with erosion control as the primary goal.

- **Habitat enhancement**

  The process of increasing the suitability of a site as habitat for some specific species.

- **Mitigation**

  Legally providing efforts for restoration towards loss of protected species or ecosystems.

3.4. Ecosystems remediation:

Environmental remediation deals with the removal of contaminants or pollution from soil, groundwater, sediment, surface water or cleaning up after an oil spill. It's the action of improving an existing ecosystem or creating a new one with the aim of replacing another that has deteriorated or been destroyed. The major purpose of environmental remediation is to restore contaminated sites or resources to reduce the negative impact of the pollutants on human and natural health. Ecosystems remediation can be:

- **Bioremediation**

The process of detoxification and degradation of heavy metals with the help of microorganisms (soil or aquatic ecosystems).

- **Phytoremediation**

The method that helps to absorb the heavy metals in the polluted ecosystem by using plants and trees to remediate and clean the environment.

3.5. Natural resources recycling:

Recycling and reusing residues reduce the necessity to extract and employ new materials from the Earth. That in turn decreases the harmful disruption and damage in the natural world (fewer forests cut down, rivers dive).

Chapter 02

Basic English sentence patterns

III-Chapter 02: Basic English sentence patterns:

1.Definition of a sentence:

A sentence (Clause or phrase) is defined as a group of words that makes sense and expresses a complete thought. With at least one subject and one verb, clauses allow us to combine ideas to show their cohesion in speech and writing language.

1.1.Sentence composition:

Sentences are composed of two parts: the subject and the predicate. The subject is the focus of the sentence it's the thing being talked about. The predicate is what we are saying about the subject.

Examples:

Subject	Predicate
The weather	will be rainy and cold for the rest of the summer.
Abbi	has a new baby named Micah
You	are going to the store with me whether you like it or not

The predicate of a sentence can be either simple or complex. A simple predicate consists of a single verb or verb phrase, while a complex predicate includes the verb and any modifiers, objects, or complements that clarify the action.

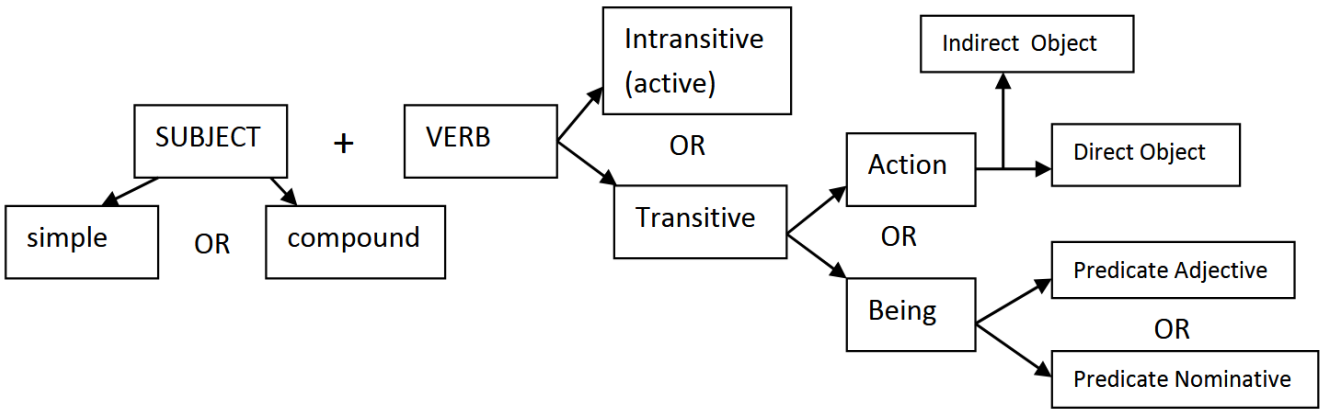

Figure 7. English sentence structure with different parts of a predicate.

2. English sentence' elements:

2.1.Verbs:

A verb is a word used to describe an action, state, or occurrence, and forming the main part of the predicate of a sentence.

2.1.1. Tenses in English sentences:

In academic style, tenses denote the time of action. They show when the work is done. English tenses are:

2.1.1. Present Tenses:

The present tense refers to the action or event that takes place or is taking place in the present. It represents the current activity or the present state of being of the subject in the given context.

- **Simple Present**: It is used to denote scientific facts, universal truths and work done on daily basis.

  Assertive form: sub + V1 + s/es + object.

  Negative form: sub + does not + V1 + object.

  Interrogative form: Does + sub + V1 + object?

Examples:

1) Group discussions help students to enhance their speaking skills
2) Group discussions do not help students to enhance their speaking skills
3) Do group discussions help students to enhance their speaking skills?

- **Present Continuous**: It is used to express an action taking place at the time of speaking.

  Assertive form: sub + is/am/are + V1 + ing + object.

  Negative form: sub + is/am/are + not + V1 + ing + object.

  Interrogative form: is/am/are + sub + V1 + ing + object?

Examples:

1) Group discussions are helping students to enhance their speaking skills
2) Group discussions are not helping students to enhance their speaking skills.
3) Are group discussions helping students to enhance their speaking skills?

- **Present Perfect**: It is used to show an action that started in the past and has just finished.

  Assertive form: sub + has/have + V3 + object.

  Negative form: sub + has/have + not + V3 + object.

  Interrogative form: has/have + sub + V3 + object?

Examples:

1) Group discussions have helped students to enhance their speaking skills.
2) Group discussions have not helped students to enhance their speaking skills.
3) Have group discussions helped students to enhance their speaking skills?

- **Present Perfect Continuous**: It shows the action which started in the past and is still continuing.

  Assertive form: sub + has/have + been + V1 + ing + object.

  Negative form: sub + has/have + not been + V1 + ing + object.

  Interrogative form: has/have + sub + been + V1 + ing + object

Examples:

1) Group discussions have been helping students to enhance their speaking skills.
2) Group discussions have not been helping students to enhance their speaking skills.

3) Have group discussions been helping students to enhance their speaking skills?

2.1.2. Past Tenses:

The past tense is used to talk about past states of being, or events. It describes a completed action that took place at a specific point in the past.

- **Simple Past:** Used to indicate an action completed in the past. It often occurs with adverb of time. Sometimes it is used without an adverb of time and for past habits.

  Assertive form: Subject + V2 + Object.

  Negative form: Subject + didn't + V1 + Object.

  Interrogative form: Did + Subject + V1 + Object?

Examples:

1) Group discussions helped students to enhance their speaking skills.
2) Group discussions did not help students to enhance their speaking skills.
3) Did group discussions help students to enhance their speaking skills?

- **Past Continuous Tense:** Used to denote an action going on at some time in the past.

  Assertive form: Subject + was/were +V1+ ing + Object.

  Negative form: Subject + was/were + not + V1+ ing + Object.

  Interrogative form: Was/were + Subject + V1+ ing+ Object?

Examples:

1) Group discussions were helping students to enhance their speaking skills.
2) Group discussions were not helping students to enhance their speaking skills.
3) Were group discussions helping students to enhance their speaking skills?

- **Past Perfect Tense:** Used to describe an action completed before a certain moment in the past, usually a long time ago. If two actions happened in the past, past perfect is used to show the action that took place earlier.

  Assertive form: Subject + had + V3 + Object.

  Negative form: Subject + had + not + V3 + Object.

  Interrogative form: Had + Subject + V3 + Object?

Examples:

1) Group discussions had helped students to enhance their speaking skills.
2) Group discussions had not helped students to enhance their speaking skills.
3) Had group discussions helped students to enhance their speaking skills?

- **Past Perfect Continuous Tense:** Used to indicate an action that began before a certain point in the past and continued up to another point in past.

  Assertive form: Subject + had been +V1 + ing + Object.

Negative form: Subject + had + not been + V1+ ing + Object.

Interrogative form: Had + Subject+ been+ V1 + ing + Object?

Examples:

1) Group discussions had been helping students to enhance their speaking skills.
2) Group discussions had not been helping students to enhance their speaking skills.
3) Had group discussions been helping students to enhance their speaking skills?

2.1.3. Future Tenses:

The future tense refers to represent an action that is going to happen or will be continuing to happen in the future.

- **Simple Future:** This tense tells us about an action which has not occurred yet and will occur in future. In Future Tense 'Shall' is used with 'I' and 'We'. 'Will' is used with all others. When you are to make a commitment or warn someone or emphasize something, use of 'will/shall' is reversed.

Assertive form: Subject + Will/Shall + V1 + Object.

Negative form: Subject + Will/Shall + Not + V1 + Object.

Interrogative form: Will/Shall + Subject + V1+ Object?

Examples:

1) Group discussions will help students to enhance their speaking skills.
2) Group discussions will not help students to enhance their speaking kills.
3) Will group discussions help students to enhance their speaking skills?

- **Future Continuous Tense**: It is used to express an ongoing or continued action in future. The action will start in future (tomorrow) and be continued till some moment in the future.

Assertive form: Subject + Will/Shall + Be + V1 + ing + Object.

Negative form: Subject + Will/Shall + Not + Be + V1+ ing + Object.

Interrogative form: Will/Shall + Subject + Be + V1 + ing + Object?

Examples:

1) Group discussions will be helping students to enhance their speaking skills.
2) Group discussions will not be helping students to enhance their speaking skills.
3) Will group discussions be helping students to enhance their speaking skills?

- **Future Perfect Tense:** It is used to express an action which will happen/occur in future and will be completed by a certain time in future.

Assertive form: Subject + Will/Shall + Have + V3 + Object.

Negative form: Subject + Will/Shall + Not + Have + V3 + Object.

Interrogative form: Will/Shall + Subject + Have + V3 + Object?

Examples:

1) Group discussions will have helped students to enhance their speaking skills.

2) Group discussions will not have helped students to enhance their speaking skills.

3) Will group discussions have helped students to enhance their speaking skills?

- **Future Perfect Continuous Tense:** It is used to talk about actions that will commence at a fix time in future and will continue for some time in future.

Assertive form: Subject + Will/Shall + Have been + V1 + ing + Object.

Negative form: Subject + Will/Shall + Not + Have been + V1 + ing + Object.

Interrogative form: Will/Shall + Subject + Have been + V1 + ing + Object?

Examples:

1) Group discussions will have been helping students to enhance their speaking skills.
2) Group discussions will not have been helping students to enhance their speaking skills.
3) Will group discussions have been helping students to enhance their speaking skills?

3. Nouns and their role in English sentences:

3.1. Definition:

A noun is a word that names a specific entity, such as a place, thing, person, or concept. Nouns can serve as the subject, direct object, indirect object, subject complement, object complement, appositive, and adjective in a sentence. we usually use nouns to express a range of additional meanings such as concepts, qualities, organizations, communities, sensations and events.

Examples:

1) **The planet** earth is round.
2) I saw **a movie** last night.
3) There are many lions at **the zoo.**

3.2. Nouns types in English language:

In English, nouns can be categorized into several types. The main categories are divided into:

- **Proper Nouns:**

Which names a specific person, place, organization, brand, day, or event.

Examples:

1) **People**: William Shakespeare, Cleopatra, Nelson Mandela.
2) **Places:** Paris, the Sahara Desert, Mount Everest.
3) **Brands :** Coca-Cola, Microsoft, Google.

- **Common Nouns :**

A general name for a person, place, or thing.

Examples:

1) **Person:** Girl, Teacher, Doctor, Baby.
2) **Place:** City, Zoo, Hospital, Country.

3) **Thing**: Book, Chair, Phone, Dog

❖ **Concrete Nouns :**

Things that have physical existence and can be perceived through the five senses.

Examples:

1) **Sight:** Tree, House, Car.
2) **Taste:** Chocolate, Pizza, Coffee.

❖ **Abstract Nouns :**

Refer to ideas, feelings, qualities, or concepts which are not concretes.

Examples:

1) **Feelings:** Anger, Joy, Fear, sadness.
2) **Qualities:** Honesty, Beauty, Bravery, Kindness.
3) **Concepts:** Freedom, Democracy, Knowledge, Time.

❖ **Countable Nouns:**

They are nouns that can be counted (singular and plural forms).

Examples:

1) **Singular**: An apple, A book, A car.
2) **Plural:** Two apples, Many books, Five cars.

❖ **Uncountable (Mass) Nouns:**

Nouns that cannot be counted individually. They usually have no plural form and used with some, much, little, a lot of.

Examples:

1) **Substances:** Water, Sugar, Rice, Air, Gold.
2) **Abstract:** Advice, Knowledge, Information, Music.

❖ **Collective Nouns:**

It refers to names of groups (people, animals, or things). They Can take singular or plural verbs depending on usage.

Examples:

1) **People:** Team, Class, Committee, Audience.
2) **Animals:** Flock of birds, Herd of cattle, Pride of lions, Swarm of bees.
3) **Things:** A bunch of keys, A pack of cards, A fleet of ships.

❖ **Compound Nouns:**

Nouns formed by joining two or more words.

Examples:

1) **Closed form**: Tooth-paste, Basket-ball, Bed-room.
2) **Open form**: Swimming-pool, Ice-cream, High-school.

❖ **Possessive Nouns:**

Nouns that show ownership or possession. They are formed with an apostrophe (’s) for singular, and (s’) for plural.

Examples:

1) **Singular**: The boy’s toy, The cat’s tail, Mary’s book.
2) **Plural:** The girls’ school, The teachers’ lounge, The dogs’ owner.

4. Pronouns in English sentences:

4.1. Definition:

A pronoun is a word used in place of a noun to avoid repetition and make sentences clearer and more concise. It can refer to people (he, she, they), objects (it, this), or unspecified things (somebody, nothing). The noun that a pronoun refers to is called the “antecedent.”

Table 01. Pronouns types in English sentences

Number	Person	Subject Pronouns	Object Pronouns	Possessive Pronouns	Possessive Adjectives	Reflexive Pronouns
Singular	1st	I	Me	Mine	My	Myself
	2nd	You	You	Yours	Your	Yourself
	3rd	She	Her	Hers	Her	Herself
	3rd	He	Him	His	His	Himself
	3rd	It	It	Its	Its	Itself
Plural	1st	We	Us	Ours	Our	Ourselves
	2nd	You	You	Yours	Your	Yourselves
	3rd	They	Them	Theirs	Their	Themselves

5. Adjectives and adverbs:

5.1.Definitions:

An **adjective** is a word that describes or modifies a noun or pronoun by providing more information about its qualities, quantity, or state. It can specify characteristics like color (blue, bright), size (small, enormous), shape (round, square), emotion (happy, fearful), or number (three, many). Adjectives help paint a clearer picture in writing and speech, allowing for more precise expression. They can appear before nouns (attributive) or after linking verbs (predicative), enhancing meaning in sentences.

Examples:

Position of Adjective	Examples	Notes
Before the noun	• He dropped the **hot** plate. • I have a **black** cat. • The **small** boy ran down the street. • What a **beautiful** view!	Adjective comes before the noun it describes.
After a linking verb	• He seems **tired.** • The view is **beautiful.** • The weather became **cold**. • My cat is **black.**	Adjective comes after verbs: to be; to seem; and to become.
For comparative and superlative forms	• She is **tall.** • She is **taller** than her sister. • She is the **tallest** person in the class.	Adjectives can change form to compare or make an exception.

An **adverb** is a word that modifies a verb, an adjective, or another adverb, providing more detail about how, when, where, why, or to what extent an action occurs. Adverbs can also intensify adjectives (**extremely** cold) or other adverbs (**very** quickly). Common types include adverbs of manner (slowly, carefully), time (now, later), place (here, everywhere), frequency (often, never), and degree (almost, too). By adding precision and clarity, adverbs enrich sentences and refine meaning. They can be categorized into several types based on their function. These categories help to understand how adverbs modify verbs, adjectives, or other adverbs

Table 2. Different types of Adverbs

Type	Function / Question Answered	Examples
Manner	How?	Quickly-Carefully- Happily
Place	Where?	Here-Outside-Everywhere.
Time	When?	Now-Today-Tomorrow
Frequency	How often?	Often-Always-Sometimes
Degree / Quantity	To what extent?	Very-Too-Almost-Enough
Reason	Provides information	Because-Therefore-So

In English, words often change form through a process called derivation, where verbs, nouns, adjectives, and adverbs are created from one another using specific suffixes or patterns.

Examples

1) To decide → decision.
2) To teach → teacher.

The same verbs can also become adjectives to describe qualities.

Examples:

1) To attract → attractive
2) To bore → boring

Nouns can shift to adjectives by modifying the end of the word.

Examples:

1) Beauty → beautiful
2) Danger → dangerous.

From adjectives, we typically form adverbs by adding ly.

Examples:

1) Quick → quickly
2) Happy → happily.

Table 3. English word families: Morphological derivatives

Verb	Noun	Adjective	Adverb
Widen	Width	wide	widely
Deepen	Depth	deep	deeply
Strengthen	Strength	strong	strongly
Lengthen	Length	long	lengthily
Heighten	Height	high	Highly
Warm	Warmth	warm	Warmly
Broaden	Breadth	broad	Broadly
Enrich	Richness	rich	Richly
Darken	Darkness	dark	Darkly
Thicken	Thickness	thick	Thickly
Sharpen	Sharpness	sharp	Sharply
Soften	Softness	soft	Softly
Embolden	Boldness	bold	Boldly
Sweeten	Sweetness	sweet	Sweetly
Lighten	lightness	light	Lightly
Brighten	brightness	bright	Brightly
Freshen	freshness	fresh	Freshly
Weaken	weakness	weak	Weakly
Harden	hardness	hard	Hardly
Shorten	shortness	short	Shortly
Quicken	quickness	quick	Quickly
Deaden	death	dead	Deadly
Stiffen	stiffness	stiff	Stiffly
Fasten	fastness	fast	Fast

6. Sentence characteristics:

6.1. Sentence types:

- **Independent Clause:**

A simple sentence (Main clause) that expresses a complete thought and can be used alone.

Examples:

1) We arrived earlier to the stadium.
2) The mall doesn't open until 9:00 AM.

- **Dependent Clause:**

An incomplete thought (Subordinate clause) that cannot stand by itself. A dependent clause is introduced by subordinating conjunctions (**after, as, before, if, though, while, whose, unless, although, because, even though, since, when, until, which, so that……),** that connect its different parts in order to complete the meaning.

Example

1) **<u>If</u>** you finish your homework at time, i will take you for a ride.

6.2. Sentence structure:

❖ **Simple sentence:**

It contains a subject (a person or thing performing an action) and a predicate (verbal phrase that describes the action) and expresses a complete thought as an independent clause. Simple sentences do not contain dependent or subordinate clauses.

Examples:

1) The baby cried for food.
2) Professor Maple's intelligent students completed and turned in their homework.
3) Megan and Ron ate too much and felt sick.

❖ **Compound sentence:**

A sentence that contains at least two independent clauses combined with a comma, a semicolon, or a coordinating conjunction (and, but, or, nor, for, so, yet). There are no dependent clauses in a compound sentence.

Examples:

1) The shoplifter had stolen clothes, so he ran once he saw the police.
2) They spoke to him in Spanish, but he responded in English.

❖ **Complex sentence:**

A sentence with one independent clause, also known as the main clause, and one or more dependent clauses, known as subordinate clauses. When the dependent clause is first in the sentence, a comma will connect the clauses. Other complex sentences link the independent and dependent clauses with subordinating conjunctions like when; how and if.

Examples:

1) After eating lunch at The Cheesecake Factory, Tim went to the gym to exercise.
2) Opinionated women are given disadvantages in societies that privilege male accomplishments.

❖ **Compound-complex sentence:**

It contains at least three clauses; two independent clauses and one or more dependent clauses; which equates to three sets of subjects and verbs. This type of sentence is a combination of a compound sentence with a complex sentence with a coordinating conjunction, with the comma placed immediately before it.

Examples:

1) After the two soccer players lost their game, they joined their other teammates for lunch, and they went to the movies.

2) The man believed in the system, and he knew that justice would prevail after the murderer was sent to jail.

6.3. Sentence Functions:

There are four types of sentences by function (Meaning) in English language:

- Declarative Sentence (statement)

Declarative sentences make a **statement**. They tell us something, give us information and normally end with a full-stop. The usual word order for the declarative sentence is:

- Subject + Verb...

Declarative sentences are the most common type of sentence and can be positive or negative.

Examples:

Positive	Negative
I like coffee.	I do not like coffee.
We watched TV last night.	We did not watch TV last night.

- Interrogative Sentence (question)

Interrogative sentences mark a **question**. They ask for information, and always end with a question mark (?). The usual word order for the interrogative sentence is:

- (wh-word +) auxiliary + subject + verb... (why,

⇩

who, when….etc)

Interrogative sentences can be positive or negative.

Examples:

Positive	Negative
Do you like coffee?	Don’t you like coffee?
Why did you go?	Why didn’t you go?

- Imperative Sentence (command)

Imperative sentences give a **command**. They tell us to do something, and end with a full-stop or exclamation mark (!). The usual word order for the imperative sentence is:

- Base verb...

Note that there is usually no subject, because the subject is understood, it is *YOU*. Imperative sentences give an order and can be positive or negative. Examples:

Positive	Negative
Stop!	Do not stop!
Give her coffee.	Don't give her coffee.

- Exclamative Sentence (exclamation)

Exclamative sentences express strong emotion, an exclamation**,** and always end with an exclamation mark (!). The usual word order for the exclamative sentence is:

- What (+ adjective) + noun + subject + verb
- How (+ adjective/adverb) + subject + verb

Examples:

Form	Function	Example
How!	make an exclamation	How silly I am.
What!		What a great car you have!

Chapter 03

Scientific English writing and vulgarization

IV-Chapter 03: Scientific English writing and vulgarization:

1. Definition of scientific terminology:

A scientific terminology is the part of the language used by scientists in the context of their professional activities. While studying nature, scientists often encounter or create new material or immaterial objects and concepts and are compelled to name them. Many of those names are known only to professionals. However, due to popularization of science, they gradually become part of common languages.

Among them, biological terminology is practiced when we learn about animals, plants, cells, or natural ecosystems, in order to set terms used for each province of this domain and for better understanding and more accurate network between all biologists of the life sciences. The language of biology is rigorous and most of the words can be broken into parts using their root words and by adding prefixes and suffixes.

Example: Biological terminology.

Field of Study	Terminology
Study of Blood	Haematology
Study of Liver	Hepatology
Study of Fungi	Mycology
Study of Algae	Phycology
Study of Virus	Virology
Study of Kidney	Nephrology
Study of Cancers	Oncology
Study of Universe	Cosmology
Study of Fruits	Pomology
Study of Birds	Ornithology
Study of Bones	Osteology
Study of Egg	Oology
Study of Eyes	Ophthalmology
Study of Soil	Pedology
Study of Brain	Encephology
Study of Nails	Cosmetology
Study of Air	Aerology
Study of Earth	Geology

2. Where scientific style is used:

Scientific style is used in contexts where knowledge, research findings, or technical information need to be communicated clearly, precisely, and objectively, especially in**:**

- **Academic and research writing :**
  - Research articles, dissertations, theses, laboratory reports, and conference papers.
  - Used to describe methods, findings, and conclusions with accuracy and neutrality.

- **Educational and reference materials :**
  - Textbooks, encyclopedias, scientific handbooks.
  - Lecture notes, academic curricula, and scholarly essays.
  - Ensures knowledge is presented systematically and consistently for learning.
- **Professional and technical communication :**
  - Grant proposals, technical reports, patents, and instruction manuals.
  - Used in medicine, engineering, agriculture, and environmental studies.
  - Guarantees reliability and reproducibility of information.
- **Oral and visual presentations :**
  - Conference talks, research seminars, and scientific posters.

The main scope and functions of the scientific style are pedagogical and scientific. With its help, it is possible to form a common intertextual space in which scientists from all over the world can communicate. Tacitly accepted standards for the formation of texts in this genre have been supported by specialists for many years.

3. Scientific paragraphs:

One of the most important goals in scientific writing is communicating complex ideas clearly. Preparing a strong structural texts and papers means that the reader can get a clear idea of where the argument is going, merely by skimming down the first line of each paragraph. For this, we have to:

A- Construct strong, clear topic sentences:

- Try to keep topic sentences simple.
- As a general rule, topic sentences should be clear enough that a reader can get the gist of your paper just by reading the first sentences of each paragraph.
- The topic sentence should identify the main point of your paragraph.
- Once you've written your paragraph, it's helpful to go back and check the meaning and the language.

B-Each paragraph should make one main point:

- In general, try to keep paragraphs between 3 and 5 sentences.
- If your paragraph is getting too long, it is probably making more than one main point, and it may be time to break it into two different topics.
- Connect your paragraphs with each other to achieve a coherent paragraph structure in your research paper.

C- Placing old information first and new information last:

- While writing multiple scientific details, we have to place the old information first and the new information last.

Example:

Farmers had been trying for the last years to provide optimal growing conditions for crops (Old information), by using soil additives as agricultural limestone in order to adjust the pH level (New information).

D- Use an active voice:

- A passive voice can make your writing sound vague and unclear, whereas an active voice provides a clear subject and verb, making your sentences more direct.
- Use strong verbs such as discovered; measured and analyzed, rather than verb phrases using forms of to be, such as; is; are; was; and were.

E-Be analytical and critical at each part:

- Try to analyze and support each idea with evidence
- Give your opinion, and make sure you link your analysis back to the question at hand

4. Scientific Texts:

A scientific text is a written work that presents information, research findings, or explanations in a precise, objective, and structured way. Its purpose is to communicate knowledge based on facts, evidence, and logical reasoning rather than personal opinion or emotion. Scientific texts are usually produced by researchers, scholars, or professionals and are intended for an academic or specialized audience. They are often found in research articles, laboratory reports, textbooks, conference papers, and technical documents. A scientific text follows strict conventions such as the use of specialized terminology, clear structure, references to sources, and cautious, evidence-based conclusions.

4.1. How to study a short scientific text:

Studying a short scientific text requires more than just reading; it involves understanding, analyzing, and retaining key information. Scientific texts, even when brief, often contain specialized vocabulary, condensed explanations, and structured ideas that may be challenging at first glance. This can be done using the following steps:

1. **Read carefully**: Go through the text slowly and pay attention to the flow of ideas.
2. **Highlight key terms**: Mark new vocabulary, numbers, or important facts.
3. **Check unfamiliar words**: Use a dictionary or glossary to understand scientific terms.
4. **Find the main idea**: What is the text mainly about?
5. **Identify structure**: Notice if the text shows background, methods, results, or conclusions.
6. **Take short notes (Summary)**: Write down the most important points in your own words.
7. **Review**: Reread your notes and try to explain the text without looking at it.

Example:

Short scientific text

Scientists have cast new light on the effects our diet has on our mental health. Researchers say what we eat affects and alters our brain chemistry up until the age of 30. They say this explains why older adults are more emotionally stable and resilient than under 30s. The research was conducted by a team led by Lina Begdache, a professor of health and wellness studies. Researchers said that while the link between our diet and diabetes, heart disease and obesity is well established, there is a paucity of research on the influence our dietary intake has on mental health. The researchers also suggested that mental well-being stimulated healthy eating, healthy practices, and exercising. The research was carried out via an anonymous internet-based survey. It was sent through social media platforms to different professional and social group networks. Professor Begdache found that adults under 30 who ate fast food more than three times a week scored higher on levels of mental distress, anxiety and depression. She said that for adults over 30, the study found that eating less carbohydrates and more fruit reduced anxiety and depression. Begdache pointed to research showing how a Mediterranean diet was as good for our brain as for our body. She said: "It has all the components that are important for the healthy structure of the brain."

Exercise 01:

Give a title to this paragraph and answer the following comprehension questions:

1. What have researchers cast on the effects of our diet on mental health?
2. Who did the article say was more emotionally stable and resilient?
3. What is Lina Begdache a professor of besides health?
4. What did the professor say about the link between diet and obesity?
5. What did the researchers say stimulated healthy practices?
6. How was the survey conducted?
7. How often did adults eat fast food to increase levels of mental distress?
8. What did over-30s eat less of to reduce depression?
9. What diet did the professor suggest eating?
10. What is a diet mentioned in the article important for?

5. Scientific hypothesis:

An idea about the natural world. This idea may come from physics, economics, psychology, medicine, or any other field that studies the natural or physical world. A scientist wants to find out whether an idea is correct and can actually predict expected outcomes in the natural world. Therefore, a scientist will test the idea (hypothesis) by conducting experiments, making observations and performing statistical analyses that can confirm it to be true, or reject it. A scientific hypothesis is assumed to be true. Therefore, it must be consistent with all possible data in the empirical world which is inexhaustive. A scientific hypothesis simply cannot be proved. Statisticians attempt to solve this dilemma by adopting an alternate hypothesis (the null hypothesis). The null hypothesis is the opposite of the scientific hypothesis. It assumes that the scientific hypothesis is not true. The researcher conducts a statistical analysis of the study data to see if the null hypothesis

can be rejected. If the null hypothesis is found to be untrue, the data support the scientific hypothesis as correct.

5.1. Scientific article:

A scientific article is a publication that supports a specific hypothesis and by which scientists communicate a significant portion of their experimentation. The scientific article must follow a uniformed structure with different parts that help readers to find expected information and analysis.

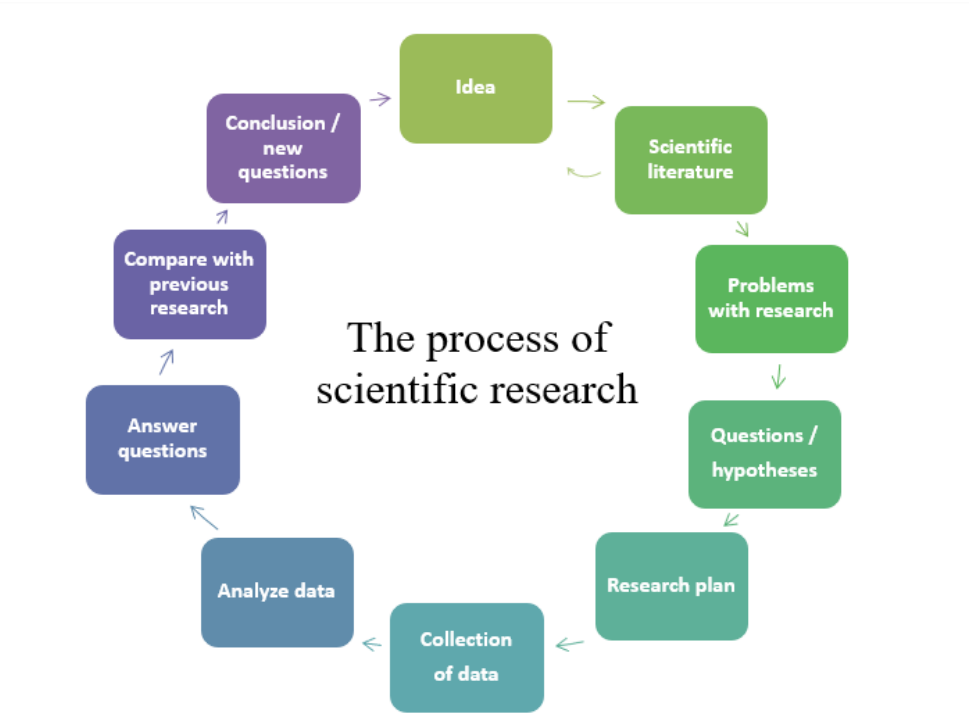

Figure 8. What You Need to Know to prepare a scientific article

5.2. Structure of a scientific article:

Most journals use a conventional TAKIMRD structure:

1. Title

2. Abstract

3. keywords

4. Introduction

5. Methods

6. Results

7. Discussion

8. References

1. **Title**

The title should reflect the topic to be presented in the scientific text and the scope of the paper. It should be very limited and specific in order to translate the clear information developed. Name and affiliation of authors must be placed under the title.

2. **Abstract**

A brief summary of the purpose that represents what the study is about and explains why it matters. It should provide a sentence or two of the study's background, a brief overview of the basic methods used, a summary of

results, and a part interpretation of the data. In general, abstracts consist of only one paragraph with about 50-100 words that should globally state the goals and the main conclusions of the scientific experimentation.

3. keywords

A list a few words or phrases placed at the end of the abstract, which indicates the most important scientific concepts and terms in the abstract.

4. Introduction

This is where the authors sketch out the background of the study and explain the objectives of their investigation. It is important to have enough citations to develop and provide the arguments leading to the hypotheses tested. The introduction section is a historical study including previous research relevant to the problem and gradually narrows to the specific topic addressed by the report.

5. Methods

This section describes what, when and how it is done from the site study location and the numbers of organisms used to the equipment, the procedures and all the techniques applied. Every chemical reaction, experimental design, statistical method and program must also be identified.

6. Results

In this section, simply results of the investigation are reported without long interpretation or elaboration. They must be organized into tables and figures with essential statistical information in order to be understood and compared. Tables and figures must be located after the text in which they are introduced. They must also be accompanied with a brief legend.

7. Discussion

This section discusses the results and comments on whether the argument research supports the original hypotheses or answers the research questions. During this section, the authors are asked to examine the results in the context of other published studies. It is important to explain how the study adds to or supports, existing knowledge. It's also important to mention future prospects in order to continue deeper researches in the studied domain.

8. References

The Bibliography section present all the references used in the paper for the different sections. It lists and indicates information and details concerning the sources used in the article. Most journals require authors to follow the journals' Instructions and to be up to date to recent issues of the journal.

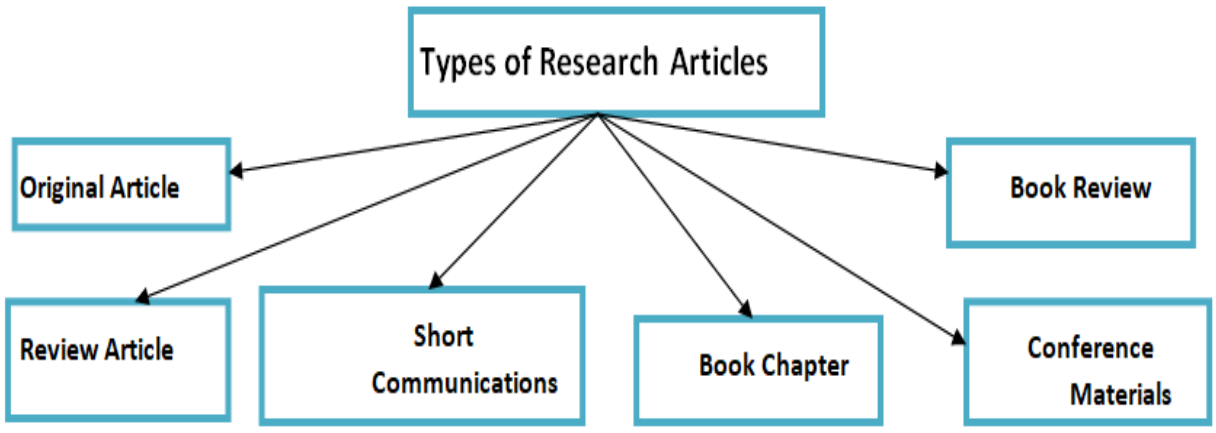

Figure 9. Most Common Types of Research Papers

5.3. Plagiarism:

Plagiarism is a form of academic misconduct in which the authors represent someone else's phrases as their own. It is acceptable to incorporate someone else's idea in your paper only if you clearly indicate that the words are someone else's and this by putting them in quotation marks and citing the source (s). Plagiarism can be detected on two forms:

- **Plagiarism of words**: when authors present someone else's exact words as if they were their words without quotation marks or documentation.
- **Plagiarism of ideas**: If the authors put someone else's ideas into their own words and then present the ideas as theirs.

Figure 10. Plagiarism types in scientific English language

5.3.1. How do i avoid plagiarism?

To produce original and credible work, students and researchers must develop the ability to recognize, prevent, and avoid plagiarism by adopting the following practices:

a) Keep track of sources

- Compile a list as you go
- Be organized
- Label ideas and corresponding sources
- If possible, use primary source

b) Quote and paraphrase correctly

- Fully rewrite the source text when you paraphrase

- Use quotation marks for quotes
- Always add a correct citation
- Don't take information out of context

c) Add correct citations

- Follow the guidelines of your citation style
- Always add a shortened in-text citation or footnote
- Always add a full citation on the reference page
- Use a reliable citation generator, such as Scribbr's

d) Use a plagiarism checker

- Detect accidental plagiarism
- Fix mistakes
- Add forgotten sources
- Choose a reliable plagiarism checker, such as Scribbr's

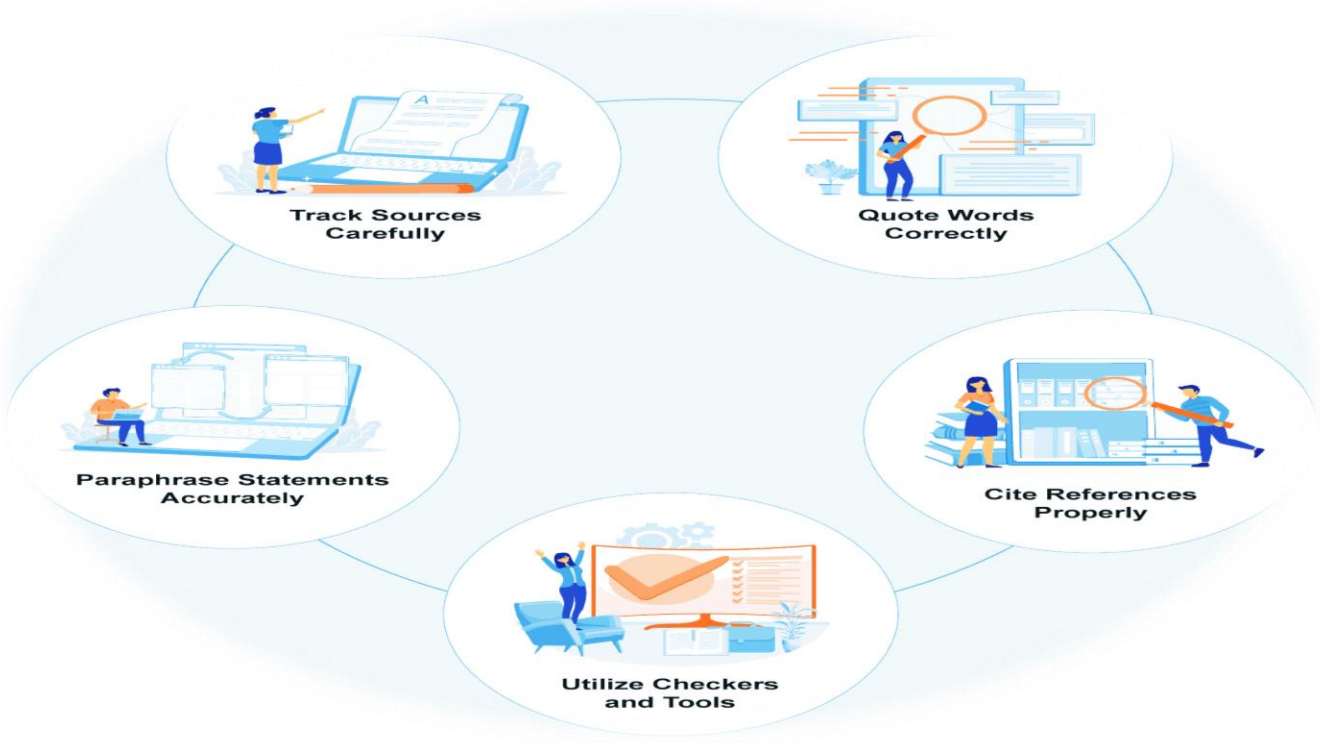

Figure 11. How to avoid Plagiarism

5.4. Scientific vulgarization:

Also known as popularization of science or science communication, is the practice of transforming complex scientific information into simple, accessible language for non-specialists. While scientific articles are usually written for researchers and professionals, vulgarization adapts the same knowledge so that the general public, students, or policymakers can understand it. This process is essential because science often deals with technical terms, complex data, and advanced methods that are difficult for people outside the field to grasp.

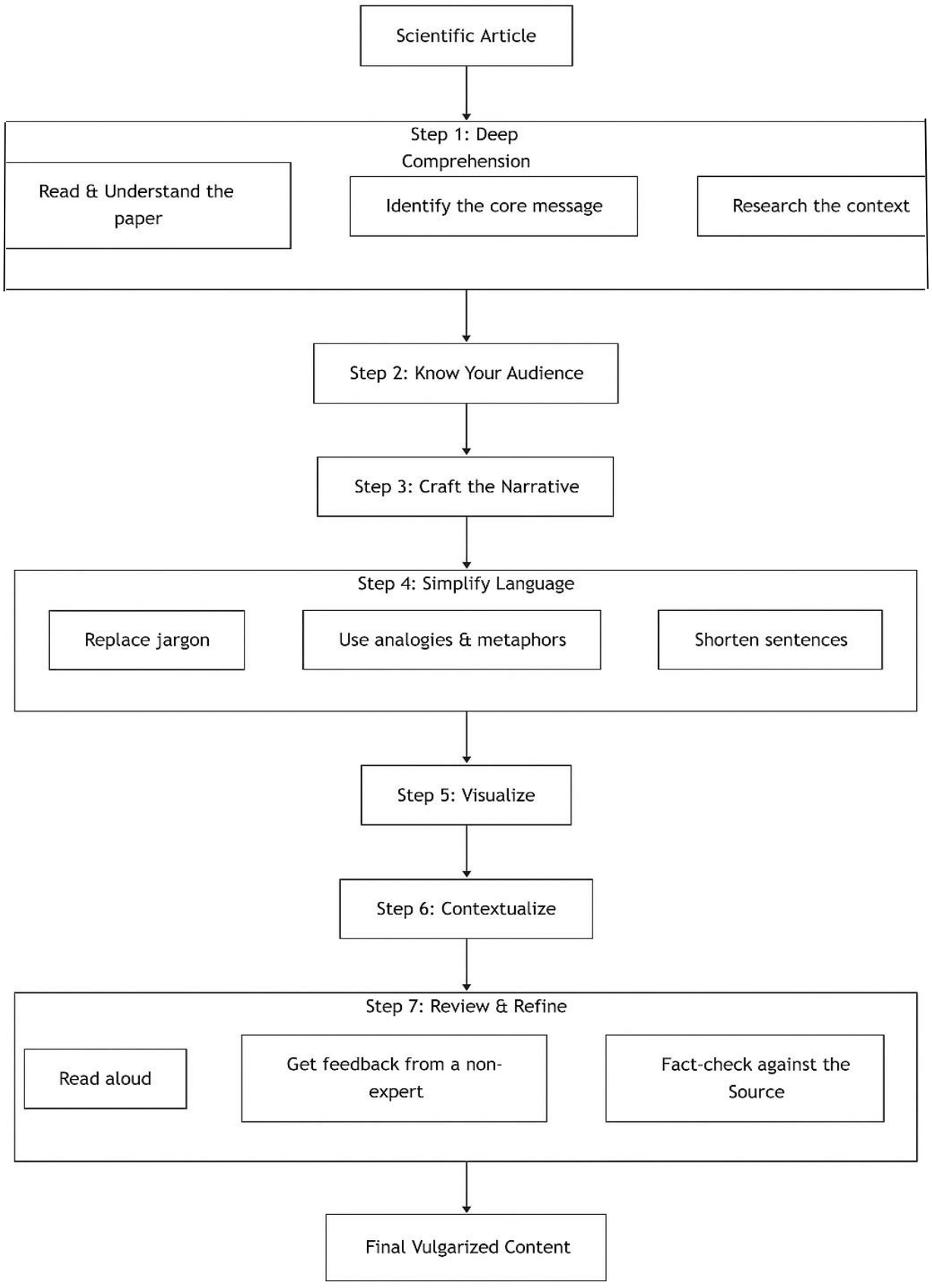

Figure 12. Principal steps for reading a scientific article

5.5. How to analyze a scientific paper?

Scientific texts are those written papers that contain information about concepts, theories or other series of topics based on scientific knowledge, which is why they are written in a special technical language for the audience to which they are addressed. The purpose of a scientific text is to inform, or to provide an explanation in a framework that holds all the different parts together. For analyzing scientific texts, we have to follow some steps and to answer the questions on the table below:

Table 04. Table questions for analyzing articles

Reference details	Author: Title: Year: Other bibliographic details:	
Background	Why did they do this research?	
Research Aims	What were their questions?	
Research Method	How did they investigate the questions? (e.g. experiments, surveys)	
Data Collection	How did they collect their data? (e.g. soil samples, species counts, mapping)	
Data Analysis	What did they do with their data? How did they analyse the data?	
Results/Findings	What did they *expect* to find and what *did* they find?	
Discussion	How does this research contribute to the field?	
Conclusion	What recommendations are provided for future research?	

The Role of Bees in Pollination and Crop Productivity

Authors: Dr. A a ; B b; C c
University of Abdelhafid boussouf Mila
Biodiversity journal 20 (04) (2025)

Pollination is a critical ecosystem service that directly affects biodiversity, food security, and global agriculture. Among animal pollinators, bees are considered the most efficient due to their specialized body structures and foraging behaviors **(Klein et *al.*, 2007)**. It is estimated that about 75% of the world's leading crops benefit from animal pollination, either through increased yield, quality, or both **(Garibaldi et *al.*, 2013)**. Tomatoes (*Solanum lycopersicum*) are partially self-pollinating, but bee visitation has been shown to increase fruit set and improve fruit quality through buzz pollination, which enhances pollen release. Despite their importance, bee populations are in decline worldwide due to habitat fragmentation, pesticide use, pathogens, and climate change (Potts et al., 2010). Understanding the measurable impact of bees on crop productivity is crucial to highlight their role in sustainable agriculture. The aim of this study was to assess the effect of bee pollination on fruit set and quality of tomato plants grown under Mediterranean conditions.

The study was carried out in June 2024 on a small-scale organic farm located 20 km outside Madrid, Spain. Fifty tomato plants of the same variety were randomly assigned into two treatments: An Open-pollinated group of flowers were left exposed to natural bee visitation. And an Exclusion group of flowers were covered with fine mesh bags to prevent any insect visitation while still allowing air circulation and self-pollination. A total of 100 flowers (50 per group) were marked at the start of the experiment. Observations were conducted daily to confirm bee activity in the open-pollinated group. After three weeks, the proportion of flowers that developed into fruits (fruit set) was recorded. Additionally, harvested fruits were weighed using a digital scale, and seed counts were performed to evaluate quality differences. Statistical comparisons between groups were made using chi-square tests for fruit set and t-tests for fruit weight and seed number, with significance accepted at $p < 0.05$.

The results revealed substantial differences between the two treatments. In the open-pollinated group, 41 out of 50 flowers (82%) developed into fruits, while in the exclusion group, only 17 out of 50 flowers (34%) formed fruits. The chi-square test confirmed that this difference was highly significant ($p < 0.001$). Fruit quality parameters also showed marked improvements in bee-visited flowers. Average fruit weight was 120 g ± 8.5 in the open-pollinated group compared to 96 g ± 7.2 in the exclusion group (t-test, $p < 0.01$). Similarly, seed counts were higher in bee-pollinated fruits, with an average of 64 seeds per fruit, compared to 54 seeds per fruit in the exclusion group ($p < 0.05$). Furthermore, bee-pollinated tomatoes exhibited more uniform shape and fewer deformities, whereas bagged fruits were often irregular and smaller.

This study demonstrates that bees play a crucial role in enhancing both the quantity and quality of tomato production. The significantly higher fruit set observed in the open-pollinated group confirms that bee visitation greatly increases reproductive success compared to self-pollination alone. The increase in fruit weight and seed number suggests that bee-mediated pollination leads to more complete fertilization, which improves fruit development. These findings are consistent with previous research showing that bee pollination boosts yield in tomatoes and other partially self-pollinating crops **(Garibaldi et *al.*, 2011; Klein et *al.*, 2007)**. The results also support global evidence that pollination by bees contributes not only to agricultural productivity but also to food quality, which has direct economic implications for farmers and markets. However, the ongoing decline of pollinator populations poses a serious risk to crop yields worldwide (Potts et al., 2010). Strategies such as reducing pesticide use, conserving floral habitats, and promoting biodiversity-friendly farming practices are therefore critical to safeguard pollination services. Future research should expand this study to field-scale experiments, evaluate the contribution of wild pollinators versus managed honeybees, and assess long-term impacts on agricultural sustainability

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- Buchmann, S. L. (1983). Buzz pollination in angiosperms. *Handbook of Experimental Pollination Biology*, 73–113.
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Exercise 01:

1- Divide the different parts of the text into the principal article sections.

2- Answer the comprehension questions bellow.

3- Analyze the different parts of the article using the table questions for analyzing articles.

4- Indicate the position of the plagiarism and its type.

Comprehension questions :

1. According to the article, what percentage of global crops rely on animal pollinators for improved yield and quality?
2. What was the main objective of the experiment conducted?
3. How were the tomato flowers divided into groups for the experiment?
4. What was the fruit set percentage in the open-pollinated group compared to the exclusion group?
5. How did the average weight of bee-pollinated tomatoes differ from that of bagged tomatoes?
6. Besides fruit quantity, what other quality traits improved in bee-pollinated tomatoes?
7. What global issues are contributing to the decline of bee populations, according to the article?
8. What conservation measures are suggested to protect bee pollination services and ensure long-term food security?

Chapter 04

Examples for Oral and written scientific communications

V-Chapter 04: Examples for Oral and written scientific communications.

1. Communication:

A communication is the process of transmitting information, ideas, or knowledge between a sender and a receiver through verbal or written channels, with the purpose of creating understanding. In a scientific context, communication refers specifically to the structured exchange of research findings, hypotheses, methods, and interpretations within the scientific community and with society at large. It ensures the dissemination, verification, and application of knowledge, thereby contributing to the advancement of science. It can be divided into:

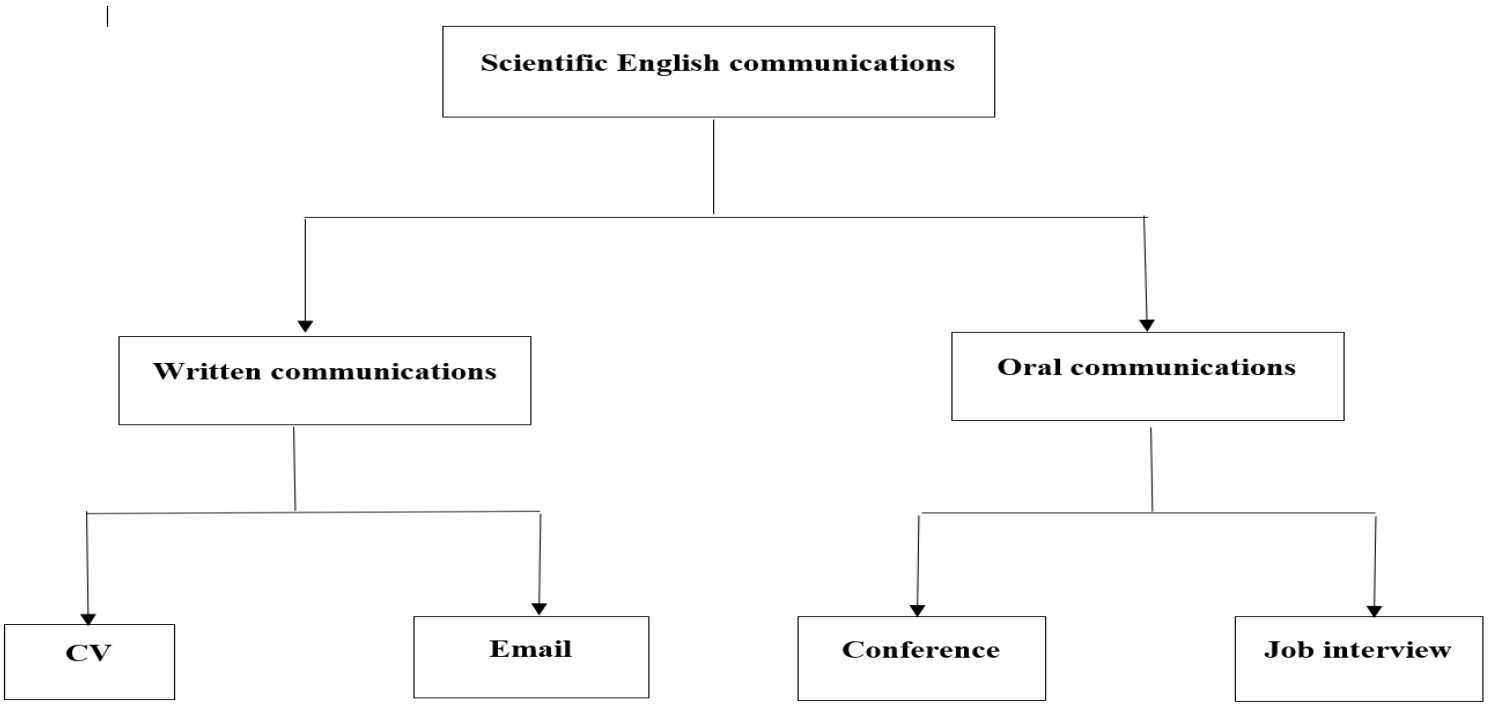
1.1.Written scientific communication:

The most recognized form is the scientific article published in peer-reviewed journals, but many other formats exist. These include research reports submitted to institutions, theses and dissertations prepared for academic degrees, and conference proceedings that document presentations given at scientific meetings. Laboratory notebooks and technical reports play a crucial role in recording experimental procedures and results, while books provide comprehensive treatments of specific subjects. Reviews and meta-analyses synthesize existing knowledge, whereas popular science articles, blogs, or outreach publications aim to reach the general public in simpler language.

1.2. Oral scientific communication:

It refers to spoken presentations that allow direct interaction between the speaker and the audience, including conference presentations, seminars, and lectures where researchers share their findings with peers. Other important forms are thesis defenses, where students defend their work before a committee, and workshops or training sessions that emphasize both presentation and demonstration. Oral communication can also extend beyond academic circles, such as media interviews and public talks aimed at popularizing science communications.

Examples:



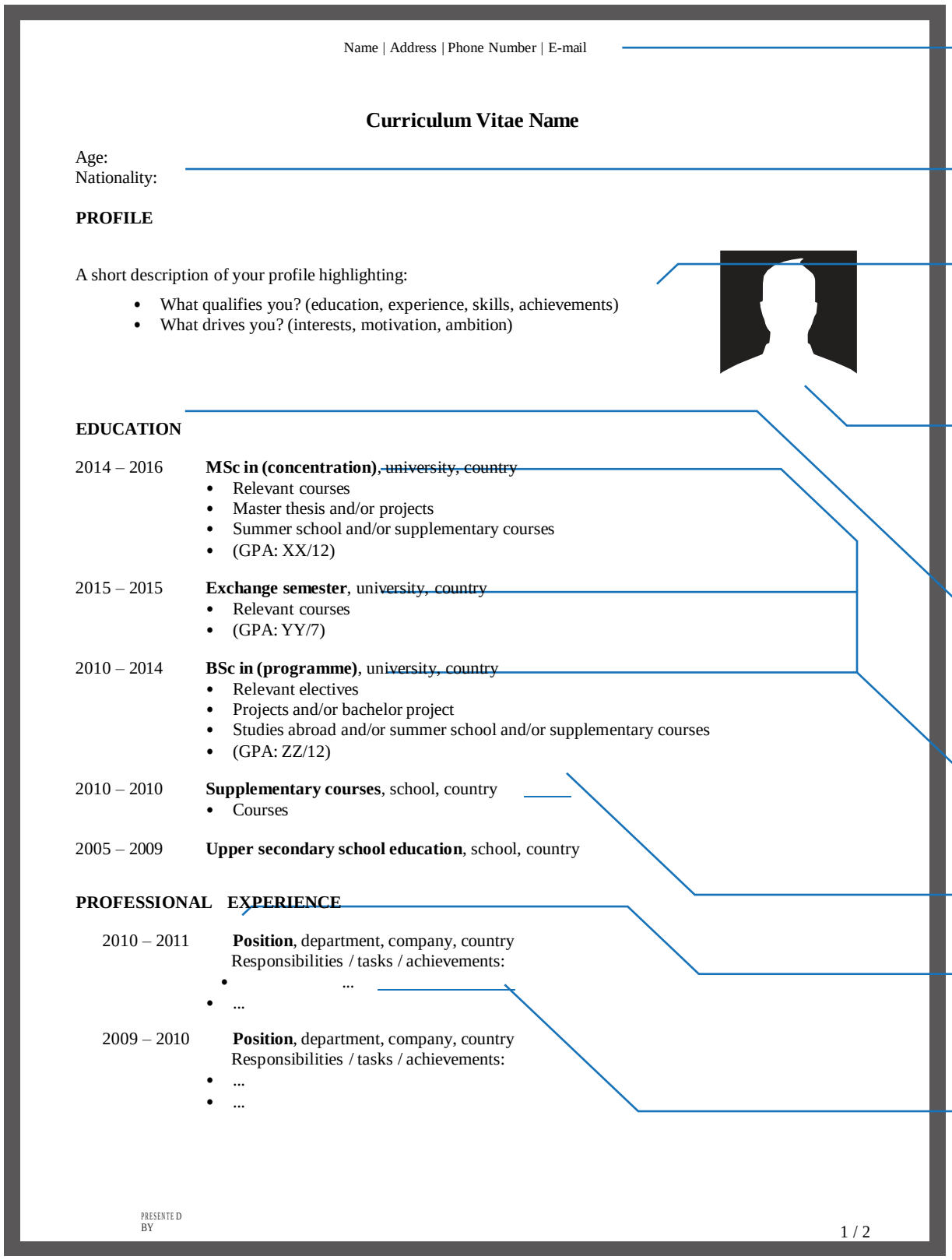
2. How to prepare a professional CV?

Curriculum Vitae (CV)

- A CV is a structured presentation of your professional profile targeted a specific job or company.
- The purpose of the CV is to get you to a job interview.
- You have approximately 30 sec. to make an impression – choose your key words strategically.

Form of CV

- A CV should be well-structured, consistent and concise – maximum 2 pages.
- Avoid long and complex sentences – use important points.
- Make a difference between headline and subheading typography.
- Choose academic language.



Name | Address | Phone Number | E-mail

Curriculum Vitae Name

Age:
Nationality:

PROFILE

A short description of your profile highlighting:

- What qualifies you? (education, experience, skills, achievements)
- What drives you? (interests, motivation, ambition)

EDUCATION

2014 – 2016 **MSc in (concentration)**, ~~university, country~~
- Relevant courses
- Master thesis and/or projects
- Summer school and/or supplementary courses
- (GPA: XX/12)

2015 – 2015 **Exchange semester**, university, country
- Relevant courses
- (GPA: YY/7)

2010 – 2014 **BSc in (programme)**, university, country
- Relevant electives
- Projects and/or bachelor project
- Studies abroad and/or summer school and/or supplementary courses
- (GPA: ZZ/12)

2010 – 2010 **Supplementary courses**, school, country
- Courses

2005 – 2009 **Upper secondary school education**, school, country

PROFESSIONAL EXPERIENCE

2010 – 2011 **Position**, department, company, country
Responsibilities / tasks / achievements:
- ...
- ...

2009 – 2010 **Position**, department, company, country
Responsibilities / tasks / achievements:
- ...
- ...

PRESENTE D BY

1 / 2

Contact information
Place your name, your address, your phone number and your E-mail on the head of the page.

Basic information
Details such as civil status, nationality, and age are optional supplements to the contact information above.

Profile
A summary of elements in the profile targeted the specific position or company. Focus on education, experience, qualifications, interests, motivation and ambitions.

Picture
Choose a picture adapted for a CV. A Passport photo size with a white or neutral background.

Education
Education should always come before experience. Describe your studies, or projects in relation to the job you are applying for.

Relevant courses and projects
Describe your studies (Relevant courses and projects) in relation to the job you are applying for.

Other education / courses
Provide details about other education if it is a supplement to your primary education.

Job title
Choose a job title that says something about your responsibilities and tasks.

Job description
Describe the job in 4 or 5 sentences and focus on what you will be able to use in your "new job".

Name | Address | Phone Number | E-mail

OTHER EXPERIENCE

2015 – **Position/role**, organisation, country
- Responsibilities / tasks / achievements

2013 – 2016 **Position/role**, organisation, country
- Responsibilities / tasks / achievements

2009 – 2011 **Position/role**, organisation, country

COURSES

2015 Project Management, course provider, (country)

2014 social media, course provider, (country)

2012 Trading course (country)

LANGUAGES

Language: Native

Language: Proficiency level, oral and written

IT

Programme: Proficiency level

Programme: Proficiency level

INTERESTS

Describe your interests and show who you are outside of work and studies (3to 5 lines).

REFERENCES

Available on request.

Other experience
Do not underestimate the knowledge you have obtained through volunteer work and positions of trust. Described int he same way as your job experience.

Languages
Indicate all relevant languages including both oral and written proficiency.

IT
State your IT (Information technology) proficiency level (Computer systems).

Interests
It does matter! Keep in mind that you may have acquired several competences from being a competitive swimmer or playing the piano.

References
You should only give references, if the job ad requires you to do so.

3. How to write a professional email?

3.1. Definition:

An Email is defined as the exchange of computer-stored messages (Digital world), from one user to one or more recipients via the internet. Emails are a fast, inexpensive and accessible way to communicate for business or personal use. Users can send emails from anywhere as long as they have an internet connection.

3.2. In which case use an Email:

Even though there are multiple communication modes, Email is still considered as the most reliable and formal mode of communication, especially in some cases:

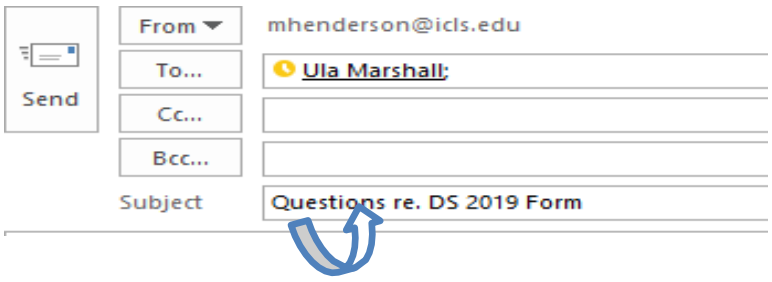
- Needing to reach someone not typically via telephone or in person.
- Information which is not time sensitive: a response may take a few days.
- Sending someone an electronic file such as images, a paper, or materials for a course.
- Needing to send information to a large number of people, such as a group of projects.
- Keeping a record of written communication that is easier to refer back to.

3.2. Email Format:

After specify the name and the address of the receiver of the Email, we have to attend the following steps:

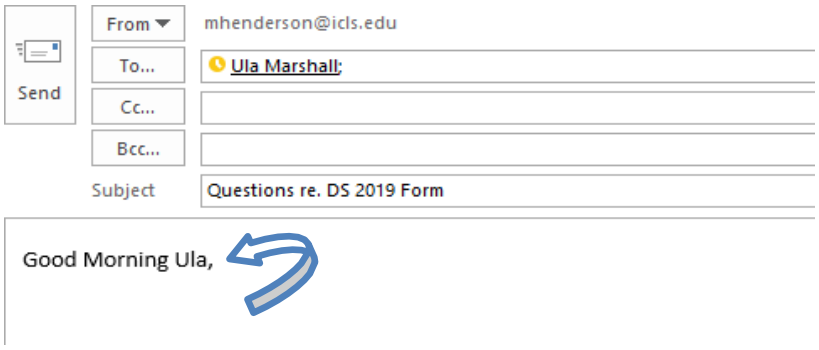
a) Subject line:

It's the first thing the recipient will see; it needs to be clear and informative and resume the global goal of the Email text. Examples: "**Meeting on Monday**" "**information request**"



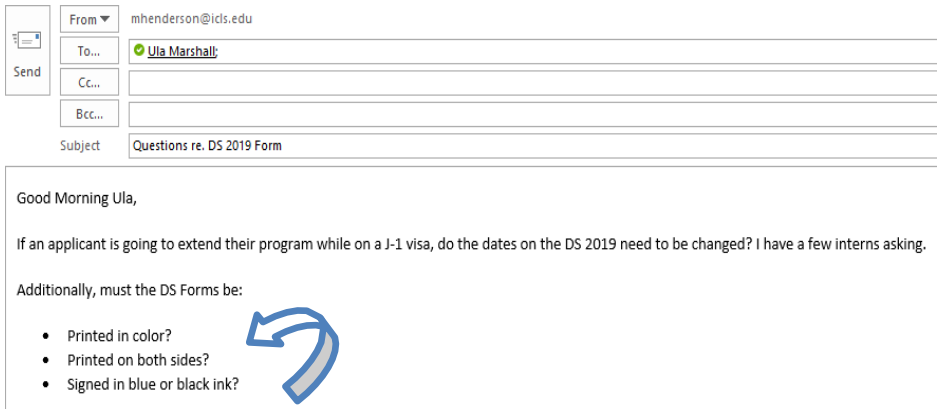
b) Greeting:

Form of salutations: When writing to someone you do not know by name, you put "**To Whom it May Concern**." When applying for a job, you use "**Dear Hiring Manager**." If you do know the recipient's name, you write "**Dear Mr./Ms. Smith**." For formal salutation, you use "**Hello**" or "**Hey**."



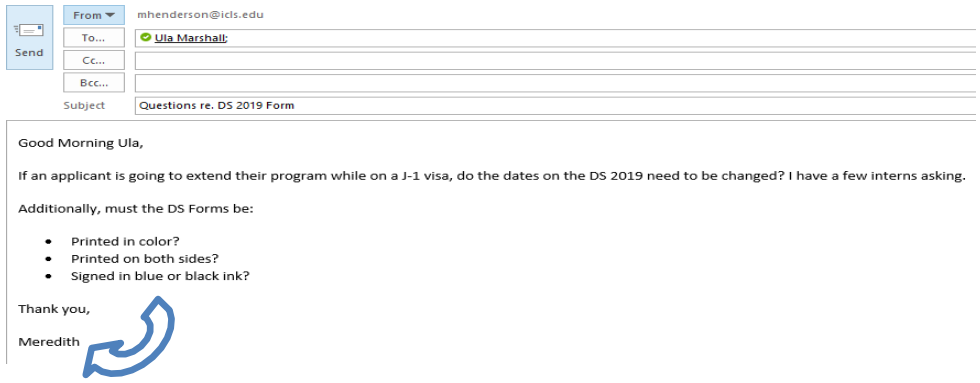
c) Email Statement:

Most of the time, emails have to be presented in form of short paragraphs, and each paragraph should contain a single precise point. It is also important to provide questions in order to have a quick response. You can support your email text with attached documents (**Papers, pictures or videos……**) in connection with the subject discussed.



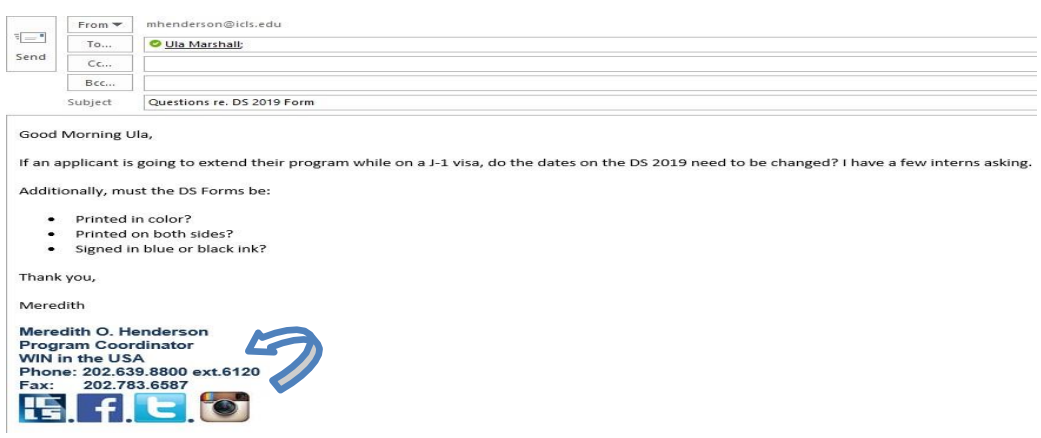
d) Closing:

It's a short formal salutation to end the text of the email. Examples: "**Best wishes**", "**Sincerely regards**", "**Thank you**". The closing part has to be followed by the name of the sender.



e) Contact information:

Make sure you include your contact information at the end of your Email. Consider creating a signature that has your full name, phone number, company website (Skype, Facebook or instagram.…) address.



4. How to prepare and present a scientific conference:

4.1. Definition:

A scientific conference is a formal meeting where researchers, scholars, and professionals gather to present, discuss, and exchange knowledge about recent studies, findings, and developments in a specific scientific field. It provides a platform for sharing original research, networking with other experts, receiving feedback, and fostering collaborations. Scientific conferences usually include oral presentations, poster sessions, keynote lectures, and panel discussions, allowing participants to communicate their work, learn from others, and stay updated with the latest scientific progress.

4.2. In which cases scientific conference is presented:

A scientific conference is usually presented on occasions where researchers, academics, and professionals come together to share and discuss new knowledge in their field. Common occasions include:

- **Annual or international scientific meetings**: organized by professional associations or research societies.
- **University or institutional conferences**: where faculty, researchers, and students present their work.
- **Specialized symposiums or workshops:** focusing on a specific scientific problem or research area.
- **Research project dissemination events**, where results of funded projects are shared with the scientific community.
- **Graduate or doctoral seminars**: often organized for students to present their research progress.
- **Multidisciplinary conferences**: where scientists from different fields exchange knowledge on broad themes like climate change, health, or technology.

4.3. How to prepare a scientific presentation:

Preparing a scientific presentation requires organizing your research in a clear, concise, and engaging way for your audience. Here are the principal steps to prepare and success a scientific presentation:

a) **Understand the event**: Check the type of presentation (oral, poster, keynote) and read the conference guidelines.
b) **Know your audience**: Identify whether they are specialists, general scientists, or mixed participants.
c) **Organize your content**: Structure your presentation into introduction, objectives, methods, results, discussion, and conclusion.
d) **Design your visuals**: Create clear slides or a poster with simple text, large fonts, and effective figures/graphs.
e) **Practice your talk**: Rehearse several times, manage your timing, and prepare smooth transitions between sections.
f) **Anticipate questions**: Think of possible questions and prepare clear answers.
g) **Handle logistics**: Register on time, prepare travel materials, and review the conference program.
h) **Prepare networking materials**: Bring business cards or contact information to share.
i) **Take care of yourself**: Rest well before the presentation and arrive early to get comfortable with the room or poster space.

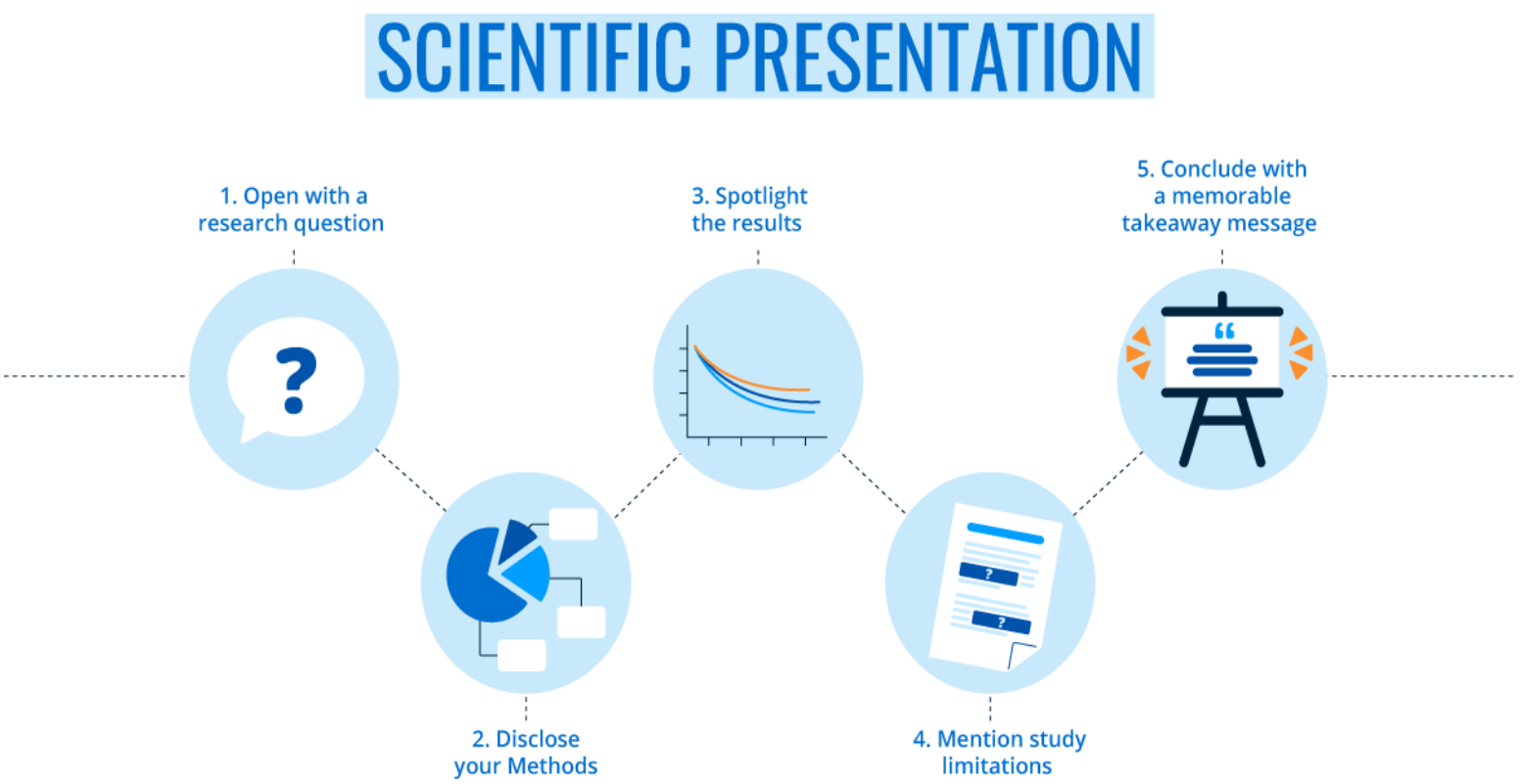


Figure 13. Principal steps for preparing a scientific presentation

4.4. How to present a scientific conference:

Presenting at a scientific conference is an opportunity to share your research findings, receive feedback, and build professional connections. The key to a successful presentation lies in preparation, clarity, and engagement.

1- First, begin by introducing yourself, your institutional affiliation, and the title of your research.
2- Then, briefly set the context by explaining why your study is important and what specific problem or question it addresses. This provides the audience with a clear understanding of the relevance of your work.
3- When moving to the main part of the presentation, focus on the core sections of your research: methods, results, and discussion. Keep explanations concise, avoiding unnecessary technical details, and support your points with well-designed visuals such as graphs, tables, or images.
4- Emphasize the most significant results, interpreting them in relation to the objectives you presented earlier and always maintain logical flow so that the audience can follow your reasoning step by step.
5- During the presentation, speak slowly and clearly, using a confident tone. Maintain eye contact with your audience and avoid reading directly from your slides or notes. Use body language naturally to reinforce your points, and manage your timing carefully to stay within the allocated slot.
6- At the end, summarize your findings and highlight their implications for the field, suggesting possible directions for future research.
7- Finally, be prepared for questions. Listen attentively, respond respectfully, and if a question is unclear, politely ask for clarification. Handling questions with openness shows your command of the subject and your willingness to engage in scientific dialogue. A professional and confident presentation will not only make your research more impactful but also leave a positive impression on your audience.

5. How to plan and conduct a job interview:

5.1. Definition:

An interview is at the most fundamental level, a meeting between strangers. It is worth bearing this in mind at all times when you are preparing for an interview. You have a very limited amount of time to make a good impression, so preparation is key. An interview should be a two-way process, but in reality, particularly early on in your career, it can often feel that all the power is in the hands of the interviewer. It can feel like you, as the candidate, are being judged and weighed in the balance, whereas an interview really should be a two-way process. You need to be sure the job and the organization is right for you too.

5.2. In which cases, job interview is requested:

A job interview is requested when an employer or recruiter wants to meet with a candidate to evaluate their suitability for a position. It usually happens in the following cases :

- **Application Stage**: After you submit your CV or application, if your profile matches the job requirements.
- **Pre-selection Screening**: When recruiters want to verify details (skills, experience, motivation) before shortlisting.
- **Hiring Decision**: When the company needs to assess several qualified candidates face-to-face (or online) to choose the best fit.
- **Internal Promotion or Transfer**: Sometimes current employees are interviewed for a higher role or new department.
- **Competitive Programs**: For scholarships, internships, or training programs, an interview may be requested to assess motivation and potential.
- **Clarification**: If the employer wants to explore points from your CV, cover letter, or test results in more detail

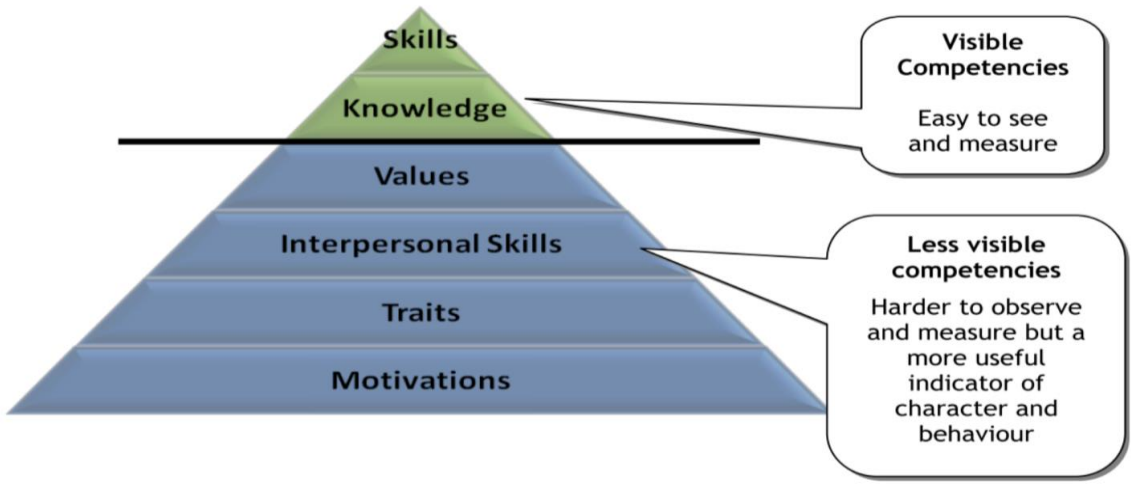


Figure 14. Competencies needed in a job request

5.3. How to be prepared for a job interview:

To be well prepared for a job interview, a candidate should begin by:

1. **Researching the company**: learning about its mission, values, products, services, and any recent achievements or projects. Equally important is reviewing the job description carefully and matching personal skills and experiences with the role's requirements.
2. **Practicing common interview questions**: preparing answer questions such as Tell me about yourself; What are your strengths and weaknesses? and why do you want to work here?
3. **Playing on behavior:** choosing professional and appropriate clothing reflects seriousness, while practicing good communication clear speaking, active listening, and confident body language helps build credibility.
4. **Respecting interview timing:** candidates need to know the exact location and plan to arrive 10 to 15 minutes early. For online interviews, testing internet connection, camera, and microphone in advance avoids last-minute issues. Bringing necessary materials (CV, notebook, pen …)
5. **Being relaxed:** Candidates should remain calm, breathe deeply to reduce nervousness. Confidence, combined with genuine interest and preparation, leaves a lasting positive impression on employers.

5.4. How to conduct a successful job interview:

A successful job interview begins with careful preparation. The interviewer should review the candidate's CV, cover letter, and any pre-screening notes in advance to understand their background. For a candidate, conducting themselves well in a job interview means showing preparation, professionalism, and confidence.

1. First, they should greet the interviewer politely, offer a firm handshake if appropriate, and maintain eye contact with a natural smile. Starting with a positive and respectful attitude helps set the right tone.
2. Throughout the interview, the candidate should listen carefully to each question and answer clearly, using specific examples to demonstrate their skills and experiences. The **STAR method** (Situation, Task, Action, Result) is a helpful way to structure responses, making them precise and convincing. It is also important to stay honest; if the candidate does not know something, it is better to admit it and show willingness to learn rather than guess.
3. Professional communication goes beyond words. Candidates should sit upright, avoid distracting habits (like playing with hands or checking their phone), and use body language that shows attentiveness. Speaking with enthusiasm and maintaining a calm, steady tone reinforces confidence and credibility.
4. At the same time, the candidate should show genuine interest in the role and the organization. Asking thoughtful questions about the job, the team, or the company's future demonstrates motivation and engagement. This transforms the interview into a two-way conversation rather than a one-sided interrogation.
5. Finally, at the end of the interview, the candidate should thank the interviewer for the opportunity and express enthusiasm about the role. A polite closing statement, combined with a follow-up thank-you email, leaves a lasting positive impression. By being prepared, respectful, and engaged, a candidate can conduct themselves in a way that maximizes their chances of success.

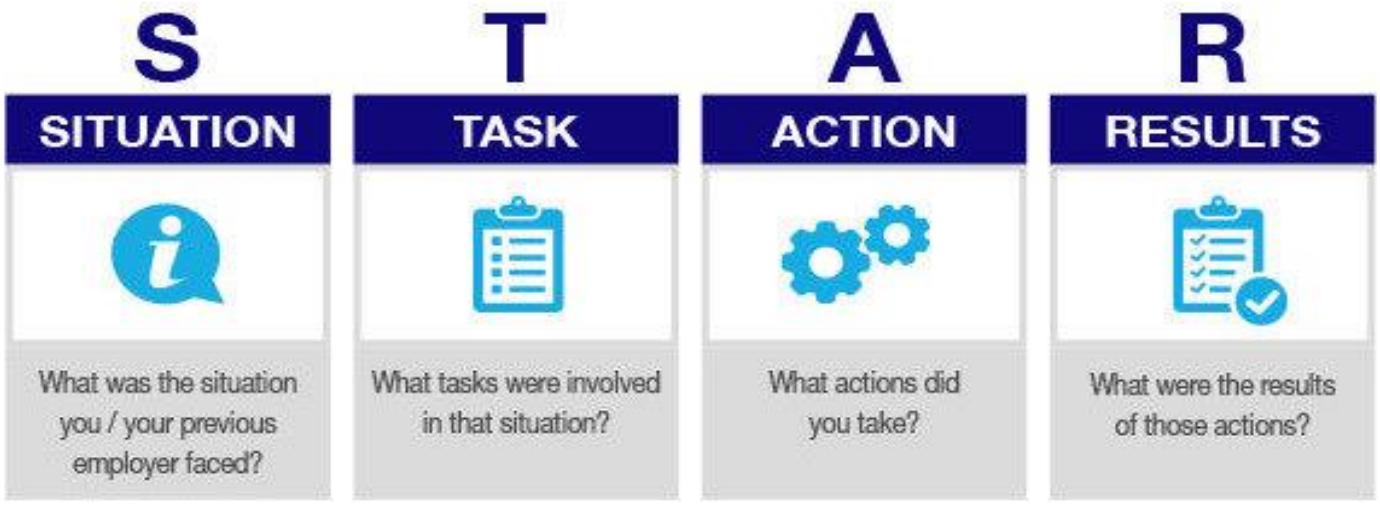


Figure 15. The STAR Method for a job interview

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Web links:

- https://fotisedu.com/ecosystem-and-its-components/
- https://6thclass.deltapublications.in/index.php/s-1-d-what-do-animals-eat/
- https://es.pinterest.com/mathumithardhar/
- https://www.taxmann.com/post/blog/all-about-biodiversity-conservation-in-biology/.
- https://vitoli.ca/en/scientific-research-what-you-need-to-know-article-1-of-4/.
- https://testbook.com/question-answer/which-type-of-plagiarism-occurs-when-a-person-comb--67a1ec04b390030d4d1a183f.
- https://slidemodel.com/poster-presentation/.
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