

Chapter I: Terminology

Objectives

- Define terminology
- Understand its importance in biology
- Learn etymology
- Identify prefixes, roots, suffixes

1. Introduction

Terminology is the set of **specialized words and expressions** used in a particular field of knowledge, profession, or discipline to describe concepts, objects, processes, and relationships **precisely and unambiguously**.

In general, terminology:

- Provides a **common language** for people working or studying in the same field
- Reduces **misunderstanding and subjective interpretation**
- Facilitates **clear communication**, learning, and knowledge transmission
- Supports **accuracy and consistency** in writing, teaching, and research

Each scientific or professional domain (such as biology, medicine, law, or engineering) develops its own terminology to ensure that ideas are communicated **efficiently, objectively, and reproducibly**.

2. Terminology in biology

Biology, like all scientific disciplines, uses a **specific and precise terminology** to describe structures, processes, and interactions in living organisms. This specialized vocabulary allows scientists, researchers, and students to communicate clearly and efficiently, regardless of their language or country.

Using correct biological terminology:

- Reduces **ambiguity and subjective interpretation**
- Ensures **accurate understanding** of scientific concepts
- Allows **replication of experiments**, which is essential in science
- Facilitates learning across different biological sub-fields (cell biology, genetics, ecology, microbiology, etc.)

For a student of biology, mastering terminology is not optional-it is a **fundamental skill** that will be used throughout academic studies and professional life.

3. Importance of Terminology in Biology

Biology deals with complex systems and microscopic structures that cannot be described using everyday language. For example, saying “*small parts inside the cell*” is vague, whereas terms like **mitochondria**, **ribosomes**, or **nucleus** provide precise meaning.

Scientific terminology:

- Creates a **common language** among biologists
- Improves **reading comprehension** of textbooks and research articles
- Enhances **written and oral scientific communication**
- Helps students transition from basic to advanced biological concepts

Learning terminology early (L1 level) builds a strong foundation for future courses.

4. Etymology of Biological Terms

4.1 Definition of Etymology

Etymology is the study of the **origin and historical development of words**. Many biological terms come from **Greek and Latin**, languages traditionally used in science.

A word may:

- Originate with one meaning
- Evolve over time
- Acquire a more precise scientific definition

For example:

- *Cell* comes from the Latin **cellula**, meaning *small room*
- *Biology* comes from Greek **bios** (life) + **logos** (study)

Understanding etymology helps students:

- Guess the meaning of unfamiliar terms
- Remember definitions more easily
- Recognize relationships between different biological concepts

5. Word Structure (Morphology) in Biology

5.1. Definition of Morphology

In linguistics, **morphology** refers to the **structure of words** and how they are formed. Most biological terms are built from three main components:

- **Prefix:** appears at the beginning of the word
- **Root:** the core element that carries the main meaning
- **Suffix:** appears at the end and gives additional information

Studying word structure helps students decode complex biological terms.

5.2. Prefix

A **prefix** is added at the beginning of a word and often modifies its meaning.

Examples:

- **bio-** = life
- **micro-** = small
- **hyper-** = above, excessive
- **hypo-** = below, deficient

Example:

- **Microorganism** → *micro* (small) + *organism* (living being)

5.3 Root

A **root word** is the **most basic form of a word** and cannot be further divided into meaningful parts. It carries the essential meaning.

Examples:

- **cell** = cell
- **cyt** = cell
- **derm** = skin
- **neur** = nerve

Root words are used to form new terms by adding **prefixes** and/or **suffixes**.

5.3 Suffix

A **suffix** is added at the end of a word and often indicates:

- A process
- A condition
- A field of study

Examples:

- **-logy** = study of
- **-itis** = inflammation
- **-osis** = condition or disease
- **-ase** = enzyme

Example:

- **Biology** → *bio* (life) + *-logy* (study of)

II. Morphological Analysis of Biological Terms (Prefix – Root – Suffix)

In this section, each biological term is fully analyzed by identifying the **prefix**, **root**, and **suffix**, with the meaning of each component. This approach helps students understand how scientific terms are constructed and how their meanings can be logically deduced.

Table 1. General Biological Terms

Term	Prefix (meaning)	Root (meaning)	Suffix (meaning)	Global meaning
Biology	bio- (life)	log (study)	-y (field of study)	Study of life
Ecology	eco- (house/ environment)	log (study)	-y (science)	Study of organisms and their environment
Microbiology	micro- (small)	bio (life) + log (study)	-y (science)	Study of microscopic life
Anatomy	ana- (up, apart)	tom (cut)	-y (study)	Study of body structure
Physiology	physio- (nature/	log (study)	-y (science)	Study of biological

Table 2. Cell Biology Terms

Term	Prefix (meaning)	Root (meaning)	Suffix (meaning)	Global meaning
Cellule / Cell	—	cell (small chamber)	-ule (small)	Basic unit of life
Cytology	cyto- (cell)	log (study)	-y (science)	Study of cells
Cytoplasm	cyto- (cell)	plasm (formed substance)	—	Cell internal material
Nucleus	—	nucle (kernel/center)	-us (structure)	Central organelle
Mitochondrion	mito- (thread)	chondr (granule)	-ion (structure)	Energy-producing organelle
Ribosome	ribo- (ribose)	som (body)	-e (noun ending)	Protein synthesis structure

Table 3. Molecular Biology & Biochemistry Terms

Term	Prefix (meaning)	Root (meaning)	Suffix (meaning)	Global meaning
DNA	—	nucleic (nucleus- related)	acid (chemical group)	Genetic material
RNA	—	ribonucleic (ribose + nucleus)	acid (chemical group)	Genetic messenger molecule
Enzyme	en- (inside)	zym (ferment)	-e (noun ending)	Biological catalyst
Metabolism	meta- (change)	bol (throw)	-ism (process)	Total chemical reactions
Anabolism	ana- (build up)	bol (throw)	-ism (process)	Synthesis reactions
Catabolism	cata- (break down)	bol (throw)	-ism (process)	Degradation reactions

Table 4. Genetics Terms

Term	Prefix (meaning)	Root (meaning)	Suffix (meaning)	Global meaning
Genetics	gen- (origin)	et (birth)	-ics (field of study)	Science of heredity
Chromosome	chromo- (color)	som (body)	-e (structure)	DNA-carrying structure
Genotype	geno- (gene)	typ (model/form)	-e (noun ending)	Genetic constitution
Phenotype	pheno- (appearance)	typ (form)	-e (noun ending)	Observable traits
Mutation	mut- (change)	at (act)	-ion (process)	DNA sequence change
Meiosis	mei- (reduce)	os (state)	-is (process)	Reduction cell division

Table 5. Microbiology Terms

Term	Prefix (meaning)	Root (meaning)	Suffix (meaning)	Global meaning
Bacteriology	bacterio- (bacteria)	log (study)	-y (science)	Study of bacteria
Antibiotic	anti- (against)	bio (life)	-tic (related to)	Substance against bacteria
Pathogen	patho- (disease)	gen (produce)	—	Disease-causing agent
Virus	—	vir (poison)	-us (entity)	Infectious agent
Mycology	myco- (fungus)	log (study)	-y (science)	Study of fungi

Table 6. Ecology & Environment Terms

Term	Prefix (meaning)	Root (meaning)	Suffix (meaning)	Global meaning
Ecosystem	eco- (environment)	syst (organized whole)	-em (structure)	Living system
Population	popu- (people)	lat (spread)	-ion (process)	Group of same species
Biodiversity	bio- (life)	divers (variety)	-ity (state)	Variety of living organisms
Symbiosis	sym- (together)	bio (life)	-sis (condition)	Living together
Autotroph	auto- (self)	troph (nutrition)	—	Self-feeding organism
Heterotroph	hetero- (other)	troph (nutrition)	—	Organism feeding on others

Table 7. Botany Terms

Term	Prefix (meaning)	Root (meaning)	Suffix (meaning)	Global meaning
Photosynthesis	photo- (light)	synth (put together)	-esis (formation)	Light-driven synthesis
Chlorophyll	chloro- (green)	phyll (leaf)	—	Green plant pigment
Germination	germ (seed)	in (begin)	-ation (process)	Seed development
Transpiration	trans- (across)	spir (breathe)	-ation (process)	Water loss through leaves

Table 8. Zoology & Physiology Terms

Term	Prefix (meaning)	Root (meaning)	Suffix (meaning)	Global meaning
Zoology	zoo- (animal)	log (study)	-y (science)	Study of animals
Respiration	re- (again)	spir (breathe)	-ation (process)	Breathing process
Circulation	circum- (around)	lat (carry)	-ion (process)	Transport of substances
Homeostasis	homeo- (constant)	stat (stand)	-sis (state)	Internal balance

III. Conclusion

Understanding the prefix, root, and suffix of biological terms allows L1 SNV students to decode unfamiliar vocabulary, improve comprehension, and develop scientific reasoning. Morphological analysis transforms terminology from memorization into logical interpretation, forming a strong foundation for all biological disciplines.