

## SS1 Biology – First Term

### WEEK 1: The Science of Living Things

#### PART 1: What is Biology?

##### ◆ Definition

**Biology** is the branch of science that deals with the **study of living organisms**, including their structure, function, growth, evolution, interaction with their environment, and origin.

- The term “**Biology**” is derived from two Greek words:
  - **Bios** – meaning *life*
  - **Logos** – meaning *study* or *discourse*

Thus, **Biology = Study of Life**.

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##### ◆ Scope of Biology

Biology covers all life forms — from the smallest bacteria to the largest animals — and how these organisms:

- **Survive**
- **Reproduce**
- **Respond to their environment**
- **Evolve over time**

It also investigates **non-living factors** that affect living things, such as climate, water, soil, and light.

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##### ◆ Branches of Biology

Biology is a broad subject with several sub-disciplines. These include:

Branch	Area of Study
<b>Botany</b>	Study of plants

Branch	Area of Study
<b>Zoology</b>	Study of animals
<b>Microbiology</b>	Study of microscopic organisms
<b>Genetics</b>	Study of heredity and DNA
<b>Ecology</b>	Study of organisms in relation to their environment
<b>Physiology</b>	Study of how living systems function
<b>Anatomy</b>	Study of internal structure of organisms
<b>Taxonomy</b>	Classification and naming of organisms

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## PART 2: Biology as a Science

### ♦ Why is Biology considered a science?

Biology is a science because it:

- Relies on **observation and experimentation**
- Uses **empirical evidence** (real, measurable data)
- Follows a **systematic process** (scientific method)
- Produces **testable and repeatable** results
- Generates **hypotheses** and **theories** based on facts

Like all sciences, Biology aims to answer questions about life using evidence and reason.

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## PART 3: Scientific Methods

The **scientific method** is a structured, logical process scientists use to investigate natural phenomena. In Biology, it is essential for discovering and proving new ideas.

### Steps of the Scientific Method

Step	Explanation
1. <b>Observation</b>	Notice a phenomenon or problem. E.g., a plant grows better in sunlight.
2. <b>Question</b>	Ask “why” or “how.” E.g., Why does the plant grow faster in sunlight?
3. <b>Hypothesis</b>	Make an educated guess. E.g., The plant grows faster because it gets more light.
4. <b>Experiment</b>	Design and perform tests to confirm the hypothesis.
5. <b>Data Collection</b>	Record measurements or results.
6. <b>Analysis</b>	Interpret the data and determine trends.
7. <b>Conclusion</b>	Decide whether the hypothesis was correct or not.
8. <b>Reporting</b>	Share results with others for review or duplication.

#### **Example in Biology:**

- A student observes that fish in cooler water swim more actively.
- Hypothesis: Fish are more active in cold water.
- Experiment: Two aquariums at different temperatures.
- Observation: Fish in the cold tank swim more.
- Conclusion: Hypothesis supported.

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#### **PART 4: Usefulness / Importance of Biology**

Biology has **real-world applications** in many aspects of human life:

Field	Application of Biology
<b>Medicine</b>	Understanding diseases, producing vaccines and drugs, surgery techniques
<b>Agriculture</b>	Improved crops and livestock through selective breeding and biotechnology

<b>Field</b>	<b>Application of Biology</b>
<b>Pharmacy</b>	Discovery and testing of drugs, understanding drug effects on the body
<b>Food Industry</b>	Fermentation (e.g., yoghurt, cheese), preservation methods
<b>Environmental Management</b>	Conservation of endangered species, pollution control, climate research
<b>Public Health</b>	Understanding how diseases spread and how to prevent them
<b>Genetics</b>	DNA testing, prevention of genetic disorders, forensic science
<b>Education</b>	Training scientists, doctors, and agriculturists

Biology helps us improve our health, protect the environment, grow more food, and live better lives.