Unit 1

Describing the Basic Concepts of Biology

Introduction

Dear Learner, welcome to the first unit of Biology. As the study of life, Biology is a fascinating subject that you can enjoy and explore with ease.

In this unit you will learn about the meaning of biology, basic biological terminologies and branches of biology. Lastly, you will examne how biology relates to other disciplines that impact our daily lives, such as Medicine, Pharmacy, Agriculture, Forestry, and Nutrition. I hope you find this journey engaging and enjoyable.

Learning Outcomes

Upon completion of this unit you should be able to:

- Explain the basic meaning and terminologies of biology;
- Discuss the branches of biology;
- Describe relationship of biology with other disciplines;
- Carry out microscopic observation of a cell;
- Describe common biology laboratory equipment and apparatus and;
- Apply scientific processes in carrying biological experiments.

Basic Concepts and Terminologies of Biology

Dear learner, do you remember that you learnt about science at primary school? You likely learned that science is a body of knowledge acquired through investigations and experimentation. You also discovered that science has three main branches: Biology, Chemistry, and Physics. Each branch focuses on a distinct area of study, which is why we are exploring Biology as a standalone subject. The person who studies science is called a **scientist.**

Therefore, Science is a *systematic study that follows established procedures to* reach a reliable conclusion.

Activity 1:

Dear learner**,** utilize library resources or reliable internet sources to search the basic concepts of biology. Then, relate the information you find to the discussions that follow below.

Meaning of Biology

Dear learner, the term "Biology" is derived from two Greek words: "bios," meaning "life," and "logos," meaning "study of." When combined, these words form the word Biology. Thus, Biology can be defined as a branch of science that focuses on the study of life. A person who studies biology is called a **Biologist**.
Biology is a science that employs systematic procedures to investigate living organisms.

Dear learner, life is exclusive to living things or organisms. These include plants, animals, fungi, and microscopic organisms like bacteria and protozoans that are too small to be seen with the naked eye but can be observed using a microscope. There are varieties of plants and animals that are found in our environment. Examples of these include trees, grasses, shrubs, cats, dogs, fish, birds, giraffes, elephants, humans, lions, and many more.

Biology plays a crucial role in today's world, as it helps us understand how living organisms' function. By exploring the branches of biology, we can gain deeper insights into organisms, comprehend and combat the spread of new diseases, and more.

Branches of Biology

Dear learner, there are many branches of Biology, but the major ones are Botany, Zoology and Microbiology.

Botany is the study of plants. A person specializing in this field is called a **Botanist**. **Zoology** focuses on the study of animals. An individual who studies animals is known as a **Zoologist**. **Microbiology** is a branch of biology that involves the study of microorganisms (microbes), which are organisms too small to be seen with the naked eye, including bacteria, viruses, and fungi. A person who studies microorganisms is called a **Microbiologist**.

Other branches of Biology

Dear learner, there are many sub-branches of Biology that deal with different aspects of living things. Here below are sub-branches of biology:

(i) **Mycology**: This branch deals with the study of fungi.

(ii) **Bacteriology:** This branch deals with the study of bacteria

(iii) Virology: This branch deals with the study of viruses

(iv) **Taxonomy**: It is branch which deals with the study of classification, nomenclature and identification of the living things.

(v) **Parasitology:** It is **a** branch which deals with the study of parasites. Parasites are organisms that live and feed on or in the body of other organisms.

(vi) **Cytology:** This branch deals with the study of structure, function and behavior of cells. As we know, all living organisms are made up of cells. Therefore, this branch studies the structural and functional units of cells.

(vii) **Anatomy:** It is a branch of biology which deals with the study of internal structure of organisms and their parts (examples; kidney, heart, liver). This branch allows an individual to understand the structure and the parts of organisms internally.

(viii) **Physiology**: This branch deals with the study of how an organism's body parts function.

(ix) **Genetics:** This branch deals with the study of heredity and variations.

(x) **Entomology:** This branch deals with the study of insects.

(xi) **Immunology:** This branch deals with the study of the immune system.

(xii) **Ecology:** This branch deals with the study of the interaction of living organisms and their environment. It studies the relationships between living organisms, how they interact with each other and their environment.

Dear learner, Observing the branches of Biology mentioned above, you can conclude that biology intersects with a wide range of fields, including Botany, Ecology, Genetics, Medicine, Microbiology, Physiology, Zoology, and many others.

Importance of Studying Biology

Dear learner, take a moment to reflect on why we study biology and why it is important. Simply saying that biology is the study of all life might not be enough to convince someone of its significance. Let's think critically about the reasons for studying biology.

Dear learner, studying biology helps us understand our surroundings, including how the human body functions, environmental dynamics, and how living organisms operate in various contexts. Take a moment to pause and reflect on these aspects before joining our discussion below.

One of the most important reasons to study biology are that its knowledge is applicable in many aspects of our daily lives that include the following:

a. Biology helps us to understand how our bodies function and the changes that occur within them

b. It helps us understand nature, including how plants and animals grow and reproduce to increase production for our needs.

c. Biology improves agricultural production, specifically in crop production and livestock breeding. Biological research enhances crop yields, develops pestresistant plants, and improves livestock breeding. It helps to identify and group living organisms based on their similarities and differences, making it easier to learn more about them.

d. Biology knowledge helps us to understand and conserve our environment properly. It helps us understand ecosystems, biodiversity, and the impact of human activities on nature. This knowledge is essential for conservation efforts and sustainable resource management.

e. Biology helps improve the standard of living for human beings, and promote care for animals and plants. The knowledge and skills gained from biology enable us and scientists to understand the cause, symptoms, and transmission methods of infections or diseases and finally come up with ways to prevent, treat and cure diseases

f. Biological knowledge helps to answer various questions that arise in our daily lives, such as how plants feed, how people conditions like diabetes and blood pressure and how plants move.

g. Biology offers a diverse range of career opportunities, such as teaching, nursing, medicine, environmental science and agriculture.

Dear learner, I hope you are now familiar with the concepts of Biology. Before proceed to, take a moment to pause and reflect on what you learned in the previous sessions. If there are any areas that remain unclear, feel free to consult your facilitator for further clarification or discuss them with your fellow learners

Dear learner let us share together the characteristics that differentiate living things from non-living things.

Characteristics of Living Things/Organisms

Dear learner, in the previous section, we discussed that life is exclusive to living things and serves as a way to distinguish them from non-living things. Can you list five characteristics that differentiate living things from non-living ones? Congratulations if you attempt this!

Living organisms are characterized by several key features: nutrition, respiration, excretion, growth, sensitivity, movement, and reproduction. For more details on these characteristics, join our discussion below.

a) Nutrition or Feeding

Imagine spending a day without eating or drinking. How would you feel? You would likely feel weak and unhappy. This illustrates that living things require food to survive.
The process by which organisms obtain essential nutrients is called **Nutrition**. For instance, humans consume proteins, carbohydrates, and lipids (fats and oils) for nutrition. In contrast, plants produce their own food through photosynthesis.

b) Respiration

Dear learner, try to cover your nose and mouth for five minutes. You will quickly feel the effects because no air can enter or leave. If air is blocked from entering and exiting, you will suffocate and become weak. If this continues for too long, you will die

This exercise highlights the crucial role of air in our survival. The process that uses the oxygen we breathe to produce energy for life activities is called *Respiration*. We use this energy to perform various tasks such as reading, running, playing, digging, and chopping firewood.

c) Excretion

Dear learner, suppose you meet a person who has been running. What do you notice about their body? You might observe that they are sweating and breathing quickly. Have you ever wondered where sweat comes from? ? When the foodwe eat is utilized by the body, it results in the formation of metabolic wastes, which must be eliminated to keep the body free from toxic substances. *The process of removing unwanted metabolic wastes (toxins) from the body is called Excretion.* Examples of waste products include carbon dioxide, nitrogenous waste, excess water and mineral salts.

d) Reproduction

Dear learner, imagine growing maize on your farm; you would naturally expect to harvest maize. Similarly, if you keep ducks and let their eggs hatch, you will get ducklings. Do you understand why this happens?

You might have realized that living things produce offspring of their own kind. The ability of organisms to produce young ones similar to themselves is known as Reproduction.

e) Sensitivity/ Irritability

Dear learner, if you prick your finger with a needle or touch a hot iron, you will feel or get pain sensation and immediately react to avoid further harm. action against those changes. All living organisms have poseess the ability to detect changes in their surroundings, such as heat, light, gravity, or chemicals and respond to them. Therefore, the ability of organisms to detect and respond to changes (stimulus) is called Sensitivity or irritability.

f) Movement

Dear learner, movement is an action of changing position. All living things have the ability of moving. The action whereby organisms move from one place to another is called **Locomotion** and such action occurs in most animals. In plants, a different type of movement occurs where only certain parts, such as shoots and roots, change position. This is often referred to as **Movement of Curvature or Tropism**.

g) Growth

Growth refers to *an irreversible increase in size and weight of an organism.* When you compare your body size and weight that you have today with what they were when you were in standard one. You will notice a significant change: your body has grown larger and heavier. This change is precisely what we mean by growth.

Dear Learner, let's explore together the connections between

Biology and other disciplines.

Relationship between Biology and other Disciplines

Dear learner, Biology is not an isolated field of study; it is interconnected with many other disciplines. Biologists have opportunities to work in a variety of fields, including Agriculture, Medicine, Pharmacy, Nursing, Veterinary Medicine, Nutrition, Environmental Conservation, and more.

Activity: Apart from the fields mentioned in the above section, identify and explain other fields of science that are related with Biology

Dear Learner, now let us discuss together the relationship of biology with just few others of science fields.

1. Agriculture

Agriculture is the field of study that deals with crop growing and animal keeping. Understanding Biology sets a foundational knowledge base for comprehending key aspects of agriculture, such as suitable conditions for crop growth, livestock health, and effective soil management.

The study of genetics and biotechnology is instrumental in developing disease-resistant crops and improving livestock breeds. These innovations significantly enhance agricultural productivity and suitability. Figure 1.3 provides an example of improved animal breeding achieved through these advancements.

Figure1.3 Improved animal breeding

2. Medicine and Pharmacy

Medicine is a broad field that deals with the practice of prevention, diagnosis and treatment of diseases. Pharmacy is a science and practice of discovering, preparing and administering drugs. Anatomy, Bacteriology and Immunology form an important part of the study of medicine.

Dear learner, through Anatomy, medical doctors gain a deep understanding of the body's structure and function. This knowledge enables them to identify problems within the body and provide appropriate treatments.

As many human diseases are caused by bacteria, Bacteriology plays a crucial role in studying the characteristics and forms of bacteria. This helps scientists identify specific bacteria responsible for certain infections.

In Immunology, researchers investigate how the body responds to disease-causing agents. This understanding is essential for developing vaccines and drugs against pathogens. Figure 1.4. shows examples of drugs that are used for treatment of diseases.

Figure: 1.4 Drugs

3. Nutrition

Nutrition is the study of nutrients in food, food, how they are used by the body, and their relationship with health and disease. Nutrition also focuses on how people can use dietary choices to reduce the risks of disease. The knowledge of biology is used by dieticians to determine the kind of diets that are suitable for people with different health needs.

Biologists have also developed breeds of livestock and crops that yield products with higher nutritional values. Examples include varieties of fruits, and vegetables rich in vitamin and other essential nutrients as well as milk with low butterfat content.

4. Forestry

Forestry is the science and practice of managing forests, trees and associated resources sustainably to meet various goals and needs. It involves establishing, managing and conserving forests. Forests are sources of fuel, building materials and medicinal plants. They also serve as water catchments. Biologists have developed varieties of trees that grow well in dry area and fast-growing trees that are planted in deforested areas. Forests also prevent desertification See figure 1.5

Figure 1.5 A Forest (planted trees)

Basic skills for Conducting Biological Investigations

Dear learner, there are basic skills that are crucial in scientific studies. Biology as a science also uses those skills to investigate or study the living things. Among those scientific skills or processes are observation, measurement and experimentation.

Scientific procedures are often used in daily life without us even realizing it. When studying biology, it is important to be aware that certain skills are essential, such as observation skills, measurement skills, and the ability to carry out experiments. These skills are crucial in studying biology as they enable us to gather data, analyze phenomena, and draw conclusions about the natural world. For further clarification on how these scientific processes work in biology, join our discussion below.

a) Observation

This refers to carefully and closely examining objects or events using our sense organs, such as our eyes, ears, skin, nose, and occasionally the tongue. We can study biology by observing various things, conditions, or situations in our surroundings using these senses. For instance, we can observe by seeing, smelling, touching (feeling), tasting (in some cases), and hearing. Additionally, observations are often made in laboratory settings during experiments. Figure 1.6 illustrates the use of the sense of smell in observation.

Figure 1.6: Smelling

Dear learner, before you proceed, takes a moment to relax and engage in the following activity: First, collect a variety of living and non-living things fromyour Surroundings. Use your senses (touch, hearing, sight and smell) toeach item.

- Then,
- List examples of both living and non-living things you collected.

  Record what you observed about each item.

b) Measurement

As biologists, you need to be able to use appropriate instruments to measure a variety of factors such as mass, length, temperature, pulse rate, and time. These measurements are made using suitable measuring instruments and units.

Dear learner, I hope you are familiar with different measuring instruments commonly found in your surroundings. Please match the instruments shown in Figure 1.7 with the places where they are typically found

Figure 1.7 Instruments used for measurement

c) Carrying out experiments

Another way you can study biology is through conducting experiments. An experiment can be designed specifically to prove or disapprove a particular hypothesis. Figure 1.8 show the student conducting experiment in the laboratory.

Figure 1.8 Conducting Experiments

In biological investigations and experiments, we apply scientific methods as described in the next section.

Dear learner, take a moment to pause for a while before proceeding with another discussion. Reflect on what you have learnt in this part.

Scientific Methods of Studying Biology

Dear learner, I hope you are now aware of the different ways to study biology. Do you think there are any other methods for studying biology? If so, what are they? Please share your thoughts with your friends nearby.

In biological investigations, as in other scientific inquiries, scientific procedures and methods are employed. Let's discuss these scientific procedures together

(i) Problem identification

This stage involves identifying a problem or issue by carefully observing objects or phenomena in detail using our senses. This process often leads to defining a hypothesis based on those observations.

Hypothesis formulation

This is an intelligent guess or tentative explanation for the observations made. It attempts to predict the possible cause of the problem. A hypothesis can be either true or false. To determine whether a hypothesis is true or not, an experiment must be conducted.

(ii) Experimentation

Experimentation involves a series of investigations designed to discover relationships or establish certain facts, which ultimately lead to the acceptance or rejection of a hypothesis.

(iii) Observations and data collections

After setting up an experiment, a researcher once again makes a careful observation and records of all events that he/she thinks are important.

(iv) Data analysis

Data analysis means transforming raw data into meaningful information related to the purpose of the experiment. This information can be presented in various forms, such as tables or graphs.

(v) Conclusion

The conclusion is either a confirmation or rejection of the hypothesis being investigated . If the hypothesis is rejected, another hypothesiscan be formulated and tested.

Before proceeding conduct the following experiment:

- Observe the life of two rats.
- Problem identification – can a rat survive without breathing?
- Hypothesis – "The rat cannot live if not breathing or the rat can live only if is breathing".
- Experiment – Place one rat in well-ventilated bottle or container Place another rat in a different container that does not allow any air to get in or out. Leave both rats in their respective containers for 10 minutes.
- Observation and data collection:
  Observe and record what happens to both rats during this time.
- Data analysis (interpretation): Interpret the results from both rats—what do they indicate about survival without air?
- Conclusion: Have both rats survived? Does this confirm or reject your hypothesis?

Based on the experiment, you can conclude that the rat in a closed bottle where air was not allowed to enter dies. This suggests that "The rat cannot live if not breathing." Our hypothesis appears to be true, and thus we accept it. However, if no rats die or all rats die under different conditions, further research could be conducted to explore these outcomes more thoroughly.

Laboratory equipment and chemicals

Dear learner, biology laboratory has its own equipment and chemicals including;

i. Measuring instruments: Examples include measuring cylinder, beam balance.

ii. Glass and plastic containers: Examples include flasks, beakers, test tubes.

iii. Handling Instruments: Examples include spoons, spatulas, pipettes, syringes, and droppers.

iv. iv. Magnifying Equipment: Examples include microscopes and hand lenses.

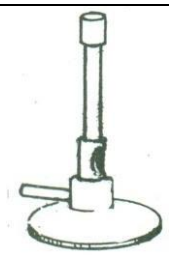
v. Cleaning Equipment: Examples include brushes, steel wire, soap, and disinfectants.vi.

vi. Safety and Emergency Equipment: Examples include eye and nose protection gear, fire extinguishers, safety blankets, and first aid kits.

vii. Solutions and Reagents: Examples include Benedict's solution, Methylene blue dye, iodine solution, Sudan III solution, 1% copper sulfate solution, sodium hydroxide (NaOH), and hydrochloric acid (HCl).

viii. Other Essential Items: Working desk/plate, water tape, sink, electricity and gas jet connection.

Dear learner, let us observe some of the laboratory apparatus and equipment asshown in figure 1.9

 Bunsen burner	 Spirit burner	 Test tube
 Test tube rack	 Test tube holder	 Beaker

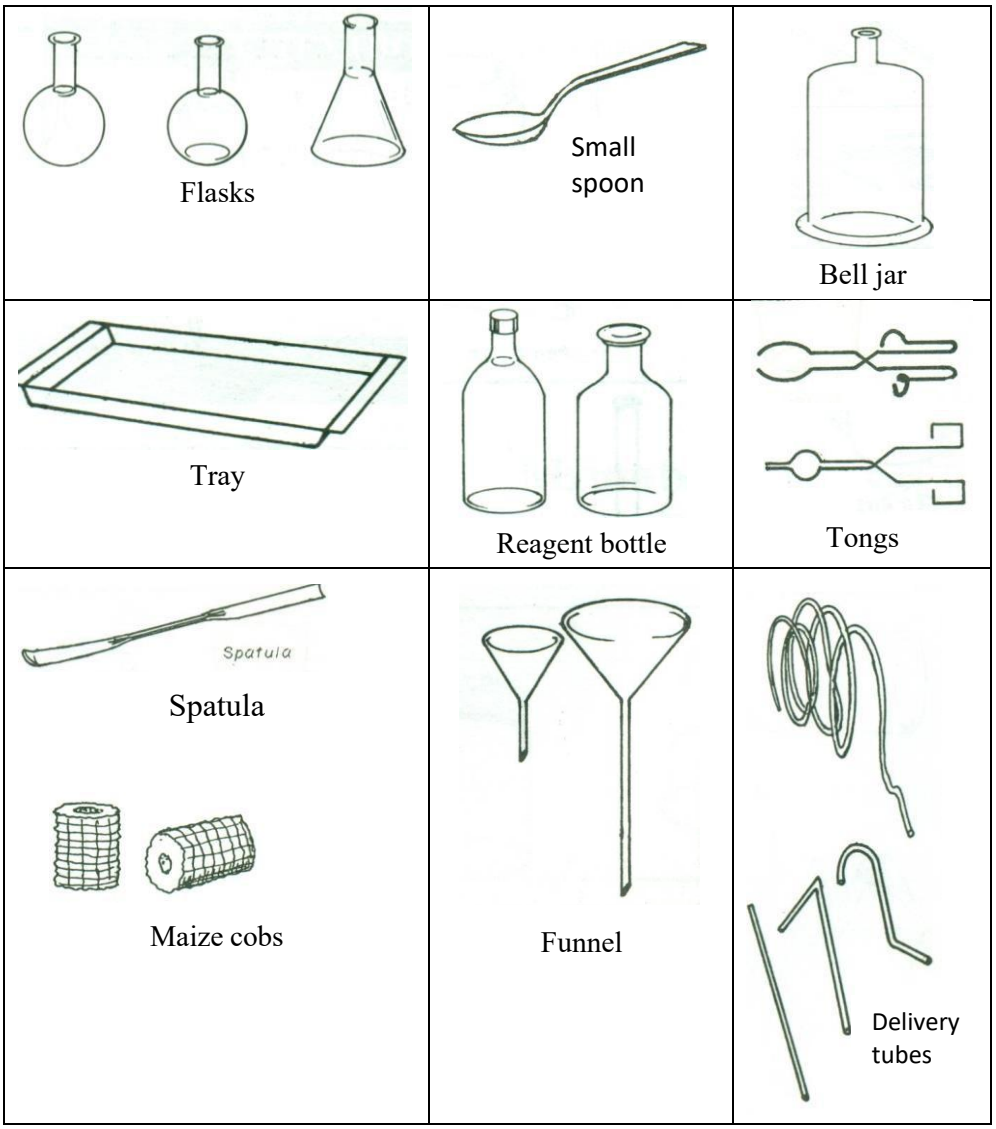


Figure 1.9 Some Laboratory Apparatus

Share with your nearby friends the use of each laboratory apparatus observed in the figure1.9.

Dear learner, you have observed some of the laboratory apparatus, now let us see some common heat sources and laboratory equipment used in biological investigations asshown in the following figures.

Heat sources

Apart from using Bunsen burners and spirit burners, there is also gas and kerosene burners, which are also used in heating purposes during experiments. See figure 1.10

Figure 1.10 Heat sources

A hand lens

This is used to magnify specimens under observations. It enables scientists to magnify small organisms or their parts, enabling clear observation and detailed study. It allows scientists to enlarge small organisms or their parts, enabling clear observation and detailed study. See figure 1.11

Figure 1.11 A hand lens

Sweep nets

A sweep net is used for catching small flying organisms such as butterflies, grasshoppers and other small animals. See sweep net in figure 1.12

Figure 1.12 Sweep net

Scoop nets

These are used for catching fish and other aquatic animals. An example of scoop net is shown in figure 1.13

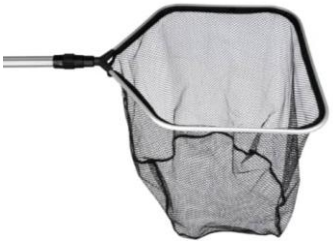


Figure 1.13 Scoop net

Quadrat

This is a wooden square or metallic grid which is used to estimate the number of organisms in a given area. See figure 1.14

Figure 1.14 Quadrat

A dissecting Kit
This is a kit containing tools for dissection of specimens. See figure 1.15

Figure 1.15 Dissecting Kit

A thermometer
It is an instrument used to measure temperature. An example of a thermometer is shown in figure 1.16

Figure 1.16 Thermometer

Biological models
These representations help scientists to understand and study biological systems or organisms. Example of models that are commonly used in teaching and learning Biology include organs like skeleton, eye, ear, liver, kidney and heart. See figures 1.17(a) and (b)

Figure 1.17(a) model of eye *Figure 1.17(b) human skeleton*

Preserved specimens

These are collected or parts of organisms that are preserved for learning purposes. Examples of preserved specimen includes, plant leaves, roots, fruits as well as insects and other small animals. See figure 1.18

Figure 1.18 Preserved specimens

How to keep live specimen

The study of biology often requires live specimens, which necessitates their storage in the laboratory. The following are some common places where live specimens are typically kept:

Cages

This is an enclosure often made up of wire mesh or bars of wood in which birds, rats, rabbits and other small animals are kept, as shown in figure 1.19

Figure 1.19 Cage

Aquarium

This is a special pond or vessel that is used in the laboratory for keeping live aquatic organisms such as fish as shown in figure 1.20

Figure 1.20 Aquarium

Dear learner, a lens cannot magnify organisms that are too small to be observed with it. In such cases, a microscope is used to magnify these tiny organisms.

The Microscope

Have you seen a microscope? If not, consider visiting a hospital or health center to observe one. What is the function of a microscope? Compare your answer with the following discussion.

What is a microscope?

The microscope is an instrument used to observe organisms and structures that are too small to be seen with the naked eye. It has the ability to magnify (enlarge) images of small objects, making them larger than their natural sizes. Refer to Figure 1.21 for a diagram of a microscope.

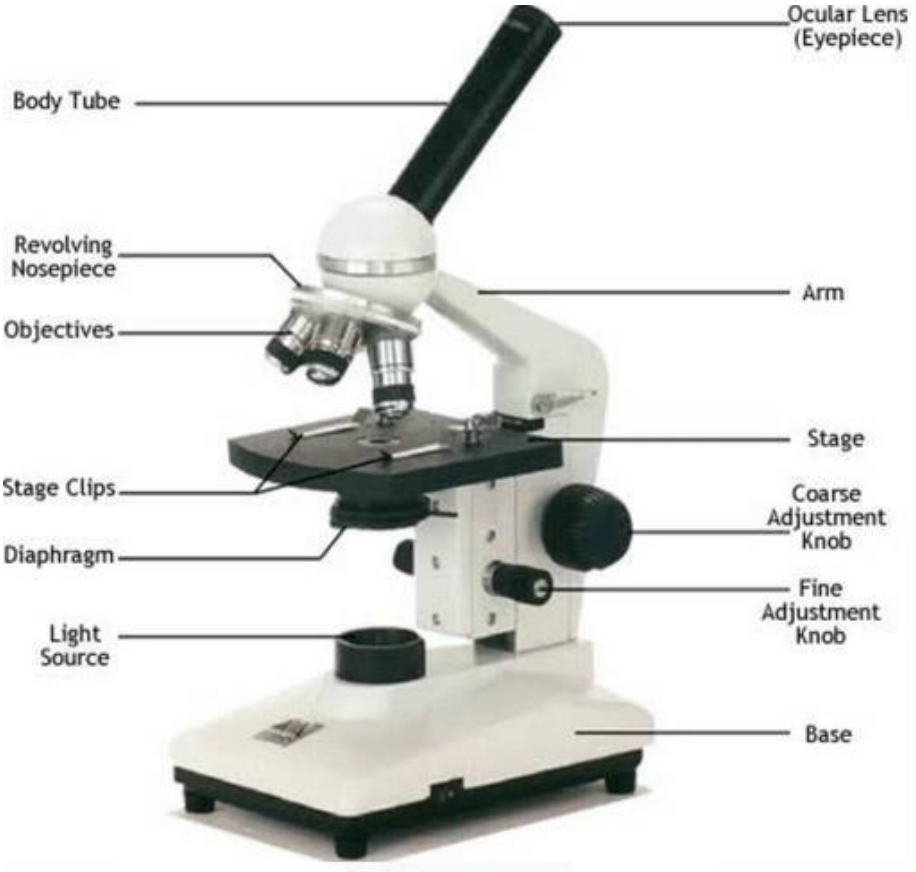


Figure 1.21: Light microscope

Parts of Microscope and their Functions

The light microscope comprises of the following most important parts:

Mirror: The mirror is used to direct light to the objects under observation.

Stage: This is the part on which the object to be observed is placed. The object is placed at the hole found at the centre of the stage. Light from the mirror passes through this hole to reach the object.

Adjustment: There are two types of adjustment knobs: **coarse** and **fine** adjustments. These knobs are used to move the stage up and down, allowing you to obtain a clear image of the object.

Eyepiece: This is where you place your eyes when observing an object. Eyepieces vary in their magnification power; examples include x5, x10, and x20 magnifications. The eyepiece is fitted with magnifying lenses that enhance the view of the specimen being examined.

Objective lens: The objective lens is also used for magnifying the object under observation. It is also fitted with magnification, x 5, x 10, x 40 and x 50.

There are two types of objective lens

(i) Low power objective lens of magnification x 5 and x 10.

(ii) High power objective lens of magnification x 40 and above.

The total magnification of an object under observation involves both the eyepiece and objective lenses. For example, if the eyepiece lens has a magnification power of x5 and the objective lens has a magnification power of x20, then the object under observation is magnified 100 times. This is calculated as follows:

Eyepiece Lens × Objective Lens = Total Magnification.

Dear learner, I hope you are now familiar with the meaning of microscope and its parts. The next section explains about the use and care of the microscope.

How to use a light microscope

(i) Mount the object to be observed on a clean microscope *slide* containing a few drops of water.

(ii) Place the microscope on a table/bench so that the mirror is opposite to you.

(iii) Tilt the mirror while observing through the eye piece to ensure light passes through the hole of the stage.

(iv) Place your slide on the stage.

(v) Adjust the knobs to get a clear image.

(vi) Draw and label your object.

Figure 1.22: How to use a microscope

How to handle and care a microscope

Dear learner, a microscope is a delicate and expensive instrument; so, it should be handled with great care. To ensure proper care of a microscope, the following guidelines must be noted:

i. Turn the adjustment knobs slowly.

ii. Keep the microscope in a case or box when it is not in use.

iii. Always clear the mirror, objective and eyepiece lenses with only soft cloth, tissue or cotton wool to avoid scratching.

iv. Always hold the microscope with both hands; your one hand should hold the arm of the microscope while the other hand holds the base in upright position.

v. When using the microscope, do not place it at the edge of the table; instead, position it at the center of the table

vi. Cover the microscope with a piece of cloth when not in use.

vii. Store the microscope in dry place.

viii. Avoid touching the mirror with bare hand.

Before proceeding do the following experiment:

Activity: Using the Light microscope

Materials: light microscope, slide and cover slip, razor blade, knife or scalpel, onion bulb, forceps, mounting needle or glass rod, iodine solution and blotting paper

Procedure:

1. Use the knife to cut the onion bulb vertically into four pieces
2. Obtain a fresh leaf from one of quarters
3. Use a pair of forceps to peal a thin layer from a leaf
4. Trim a thin layer to approximately 5mm x 5mm using the scalpel or knife
5. Put a drop of water on the microscope slide, place a trimmed thin layer of the onion leaf in the drop of water using a grass rod.
6. Gently cover the specimen with a coverslip, ensuring that no air bubbles are trapped inside.
7. Dry any excess water from the sides of the coverslip using a blotting paper.
8. Mount the slide on stage of the light microscope. Hold it in place with the stage clips.
9. Observe the specimen under the low power objective lens, then observe under the medium power objective lenses.
10. Remove the slide from the microscope stage. Then. remove the specimen from the slide and put a new specimen. Put a drop of iodine on the specimen. Repeat the procedures. *Iodine makes the specimen clear.* Use blotting paper to eliminate any excess iodine.
11. Observe the specimen again under low power and medium power objective lenses
12. What did you observe?

Unit Reflection

Reflect on the following to check if you have understood the unit:

1. Do you believe that what you learned in this unit is important to you?
2. Are you equipped to help your community solve problems that may arise from neglecting the study of biology?
3. Which part of this unit was most challenging for you, and why did you find it difficult?
4. What did you find to be the most interesting part of this unit, and why did it capture your interest?

Unit Assignment

After completing reading this module, do the following questions, make sure you put your work in your portfolio.

1. Collect the following items: a stone, a grasshopper, a chair, a maize plant, earthworm, and a piece of charcoal. Then answer the following questions
   - (i) Try to categorize these items into two groups based on what you have learnt from this unit.
   - (ii) In which group do you belong?
   - (iii) What is the term used to describe the study of the group in which you belong?
   - (iv) What are the differences betweenthe two groups?
   - (v) Briefly explain the characteristics of the group you belong to

2. Write down the branch of biology which deals with the following studies:
   - (a) Study of animals …….
   - (b) Study of plants ……....
   - (c) Study of fungi ……..
   - (d) Study of bacteria ……..
   - (e) Study of viruses …….....

3. (a) Give reasons to why a stone is termed as a non-living thing and a hen is grouped as living-thing (five reasons).

   (b) Write down any other five non-living things you know.

4. Biology is one of science subjects which most people like. What are the reasons which make people to study this subject?

5. Plants and animals are living organisms, but they are not the same. According to your experiences give four differences between them?

6. Describe the ways of handling the microscope.

7. Draw any five-laboratory apparatus used for measuring purpose.