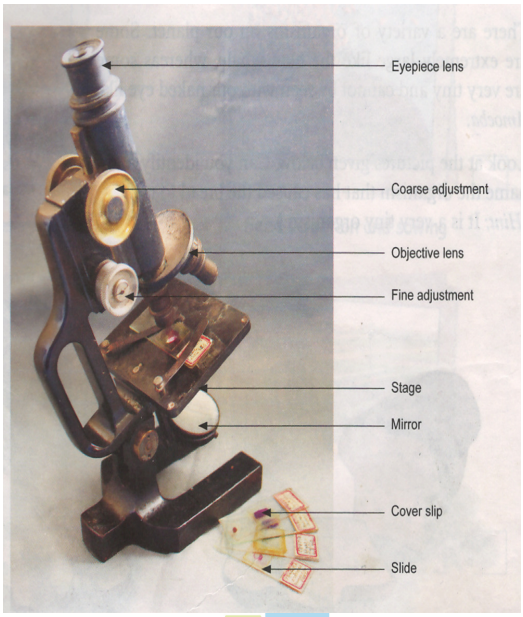
8th – Micro Organism - I

There are a variety of organisms on our planet. Some are extremely large like the blue whale, whereas some are very tiny and cannot be seen with our naked eye like Amoeba. Such extremely tiny organisms known as **microorganisms** can be seen with the help of an instrument called **microscope**. The study of such microorganism is called **microbiology**.



MICROSCOPE: A microscope is an instrument that magnifies smaller objects with the help of lenses. It is also known as a compound microscope. The different parts of a microscope are shown in the figure. The object to be viewed is generally referred to as the specimen.

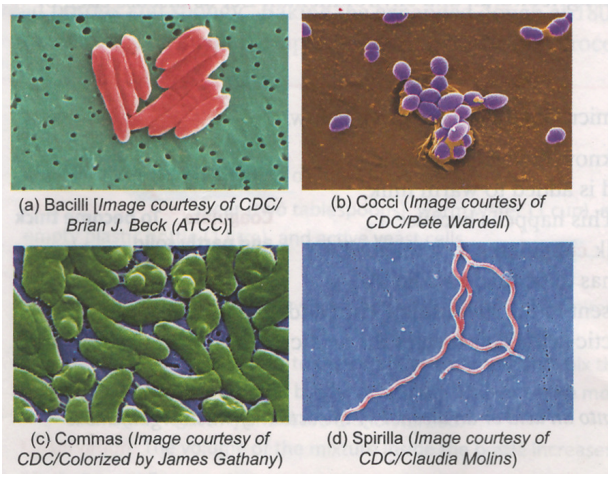
A thin sheet of glass called a microscopic slide is used to hold a small sample of the specimen. A second, much thinner, sheet of glass called cover slip is placed over the sample. The cover slip protects the microscope's objective lens by preventing it from coming into contact with the specimen sample. It also helps to create an even thinness for the sample.

The basic steps to use a microscope are as follows.

1. Clean the mirror using a soft, clean cloth, if required.
2. Place the slide (with the specimen) on the stage.
3. Adjust the focus of the eyepiece and the objective lens.
4. View the slide through the eyepiece

Types of Microorganisms: Organisms that are visible only through a microscope are called microorganisms (micro means very small) or microbes.

Micro-organisms are found in almost in all kinds of environment. They are found almost everywhere in ice-cold regions, hot springs and desert, and even inside the bodies of animals and human beings. Some live alone, while others grow in groups called colonies. They survive in extreme climatic conditions by forming a hard outer covering called **cyst.**


(a) Bacilli [*Image courtesy of CDC/ Brian J. Beck (ATCC)*]
(b) Cocci (*Image courtesy of CDC/Pete Wardell*)
(c) Commas (*Image courtesy of CDC/Colorized by James Gathany*)
(d) Spirilla (*Image courtesy of CDC/Claudia Molins*)

Microorganism car be divided into five major groups:

1. Bacteria
2. Protozoa
3. Fungi
4. Algae
5. Viruses.

Bacteria: They are among the smallest and oldest organisms on our planet and are found in four different shapes: rod-shaped (bacillus), spherical (coccus), curved (commas), and spiral (spirillum). Lactobacillus and Streptococcus are examples of bacteria. Some bacteria like saprophytic bacteria are useful which breakdown dead plants and animals. They are called decomposers. Some bacteria grow in the presence of oxygen and are called **aerobic bacteria**, those which grow in the absence of oxygen are called **anaerobic bacteria**. **Uses of Bacteria**:

1. Fixation of nitrogen: Rhizobium bacteria change the nitrogen present in air into nitrate. This process is known as fixation of nitrogen.

2. Decay of plants and animals wastes: some bacteria use dead plants and animals as their food, and thus break them down to produce humus which use as fertilizer.

3. Food Production: Making curd and cheese: curd is made at home by adding a spoonful of curd to warm milk, which turns into curd overnight. This happens because a protein called casein present in milk coagulates to form curd, for conversion of casein to coagulate; the milk has to be made acidic. A bacterium called Lactobacillus, present in the spoonful of curd added to the milk, converts the lactose sugar present in milk to lactic acid. This creates the acidic environment needed for casein coagulation. The process of conversion of a sugar into an acid or an alcohol by the action of microorganisms is called fermentation.

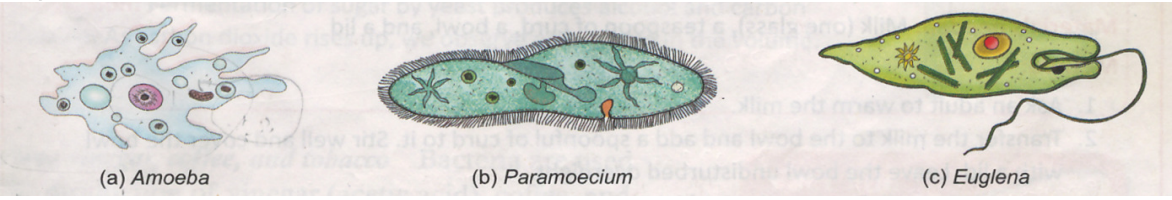
4. Digestion in animals: Escherichia coli bacteria are present in the intestines of humans and herbivorous animals which helps in digestion of food.

5. Comercial use or industrial use:

1. Helps in the production of wine and vinegar.
2. Helps in tanning of skins to make leather.
3. The bacteria enter the stem of flax plant to loosen the fibers which used to make linen thread this process is known as retting.
4. Helps in production of some vitamins and antibiotics.
5. Helps in production in chemicals and citric acid.

Harmful bacteria: They are generally parasites and cause large number of diseases in animals and plants. The disease caused in humans are tuberculosis, typhoid, tetanus, whooping cough, cholera and leprosy. Food spoiled by bacteria gives foul smell and bad taste.

Protozoa They are a group of animal-like, single-celled organisms. They can move from one place to another. They have different shapes. Some live in fresh or salty water and some live in the soil. Amoeba, Paramecium, and Euglena are examples of protozoa.



Amoeba: It is a simplest unicellular organism and lives in fresh water. Movement occurs with the help of finger like structure called pseudopodia. Amoeba eats tiny parts of plants like algae. The pseudopodia surround the food particle and takes it inside.

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Paramecium: it is slipper shaped and lives in fresh water. There are minute hair like structures on the body called cilia, which help in movement and catching food.

Plasmodium: It causes malaria. It lives as parasite in two place (a) In RBC and liver of man (b) In the saliva and stomach of female anopheles mosquito.

Useful Protozoa

1. Degradation of waste.
2. The digestion of cellulose as they are present in the alimentary canal of animals.
3. Formation of food chain as they are the food for the aquatic animals like fish mollusks.

Harmful Protozoa:

1. Entamoeba histolytica in human intestine causes amoebic dysentery.
2. Entamoeba gingivalis found in tartar on teeth causes pyorrhea.
3. Malaria is caused by the protozoan Plasmodium.

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