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PLANT AND ANIMAL TISSUES
PD 1

SUBJECT : (SCIENCE-BIOLOGY)
CHAPTER NUMBER:1
CHAPTER NAME : PLANT AND ANIMAL TISSUES

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SUBTOPICS

- Levels of organization in organisms
- Tissues: definition
- Types of plant tissues
- Meristematic and Permanent tissues

LEARNING OUTCOMES

Students will be able to :

- Levels of organisation
- define histology.
- define tissues and state its function.
- familiarize themselves with the importance of tissues in acomplex organism
- differentiate the types of plant tissues and describe meristematic tissue

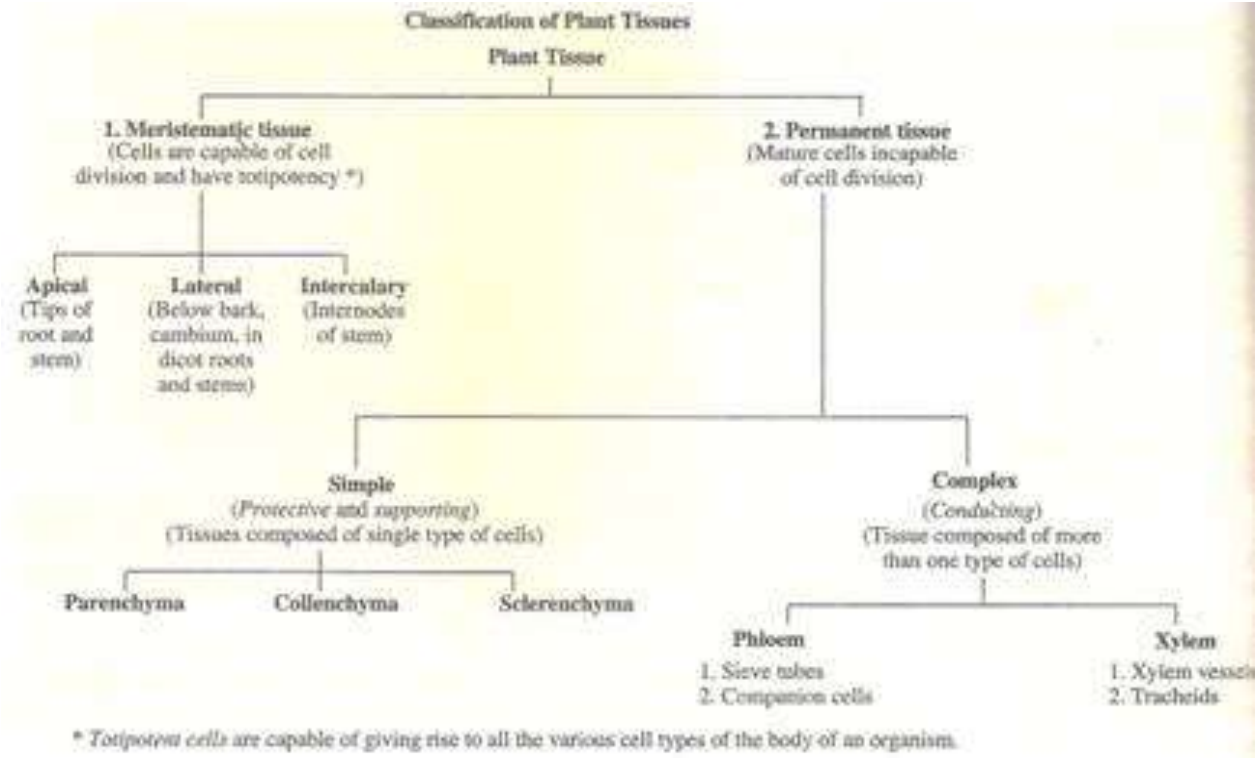
LEVELS OF ORGANISATION

LEVELS OF ORGANISATION

TISSUES:DEFINITION AND IMPORTANCE

- A group of cells similar in origin that are specialized to perform a particular function forms a tissue.
- The branch of science that deals with study of tissues is known as Histology.

CLASSIFICATION OF PLANT TISSUES



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MERISTEMATIC TISSUES: CHARACTERISTICS

- Capable of dividing and redividing
- Have dense and active cytoplasm
- Thin cell wall
- Prominent nuclei
- Lack vacuoles

MERISTEMATIC TISSUES: CHARACTERISTICS

- Capable of dividing and redividing
- Have dense and active cytoplasm
- Thin cell wall
- Prominent nuclei
- Lack vacuoles

MERISTEMATIC TISSUES: TYPES

- Apical meristematic tissue-present in root and shoot tips and help in increasing length of the stem
- Lateral meristematic tissue- present in lateral sides of stems and roots
- Intercalary meristematic tissue-present in base or nodes and internodes of twigs or leaves and helps in longitudinal increase of length.

MERISTEMATIC TISSUES: TYPES

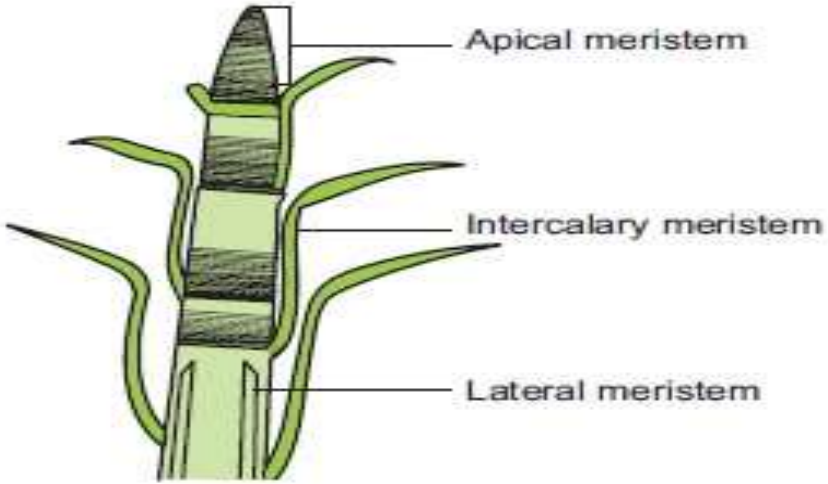

Figure 9.1: Different types of meristems on the basis of position in plant body

HOME ASSIGNMENTS

Following questions are to be worked out

Q1. Write the importance of tissues in a living organism.

Q2. Explain the cellular organization in a multicellular organism. How is it helpful to the organisms?

Q3. How do you rank the following with respect to cell, tissue, organ or organ system?

a) Amoeba b) Euglena c) Skin d) Lungs e) Neuron f) Cardiac muscles

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CLASSIFICATION OF PLANTS
PD 2

SUBJECT : (SCIENCE-BIOLOGY)
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CHAPTER NAME : CLASSIFICATION OF PLANTS

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SUBTOPICS

1. Kingdom Monera:
   - Structure of Bacterium cell, common forms with examples
   - Useful and Harmful Bacteria.

LEARNING OUTCOMES

Students will be able to :

- Describe the characteristics of kingdom Monera
- Detail structure of bacterium cell
- Explain types of bacteria
- List the usefulness and harmfulness of bacteria with examples of few.

MONERA

- These organisms do not have a defined nucleus or organelles and are unicellular.
- Cell walls present in some organisms of this group.
- Nutrition: Autotrophic or heterotrophic
- Examples: Bacteria and blue-green algae

TYPES OF BACTRIA

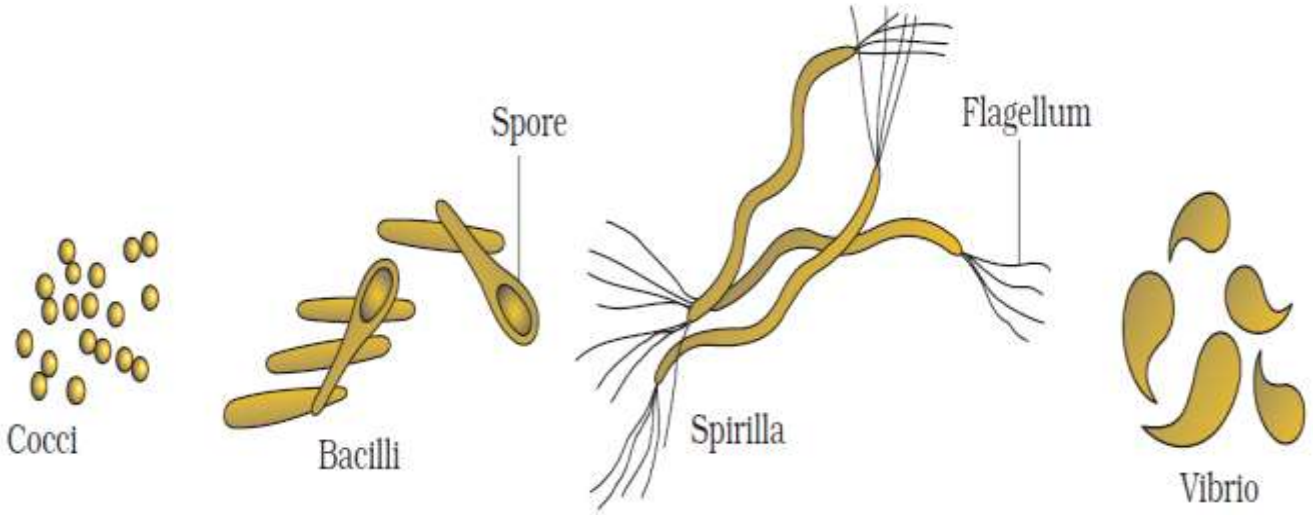
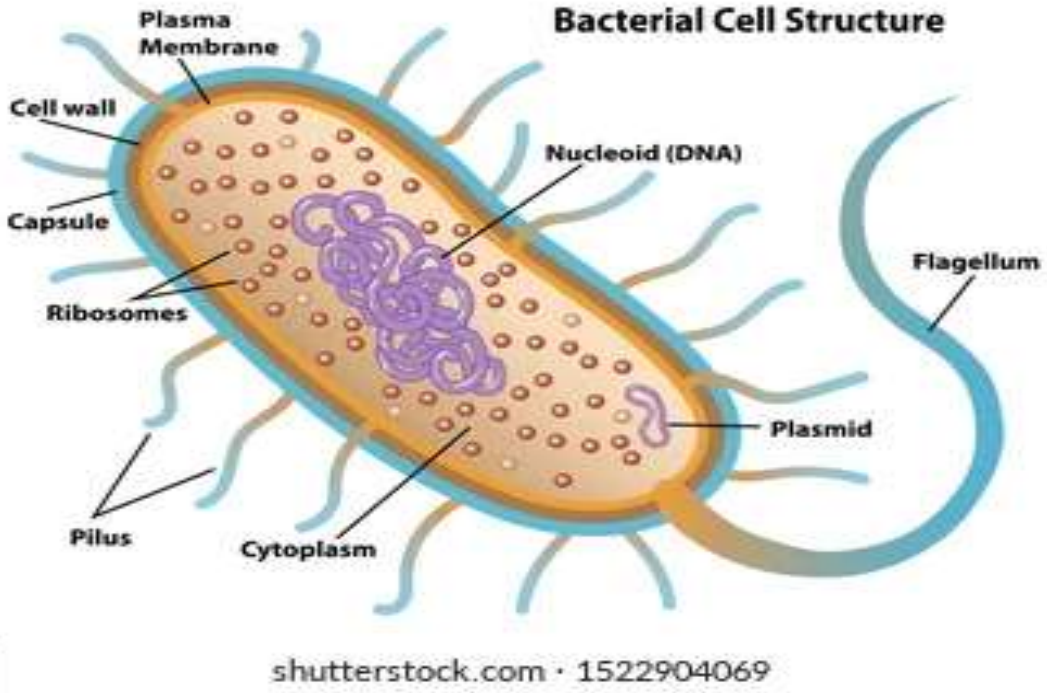


Figure 2.1 Bacteria of different shapes

STRUCTURE OF A BACTERIUM CELL



STRUCTURE OF A BACTERIUM CELL

USEFUL BACTERIA

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USEFUL BACTERIA

- **Medicines**

Some useful bacteria are used in making of medicines known as antibiotics which stops the growth of other harmful microbes.

- **Curdling of milk and cheese formation**

Lactobacillus help in conversion of milk to curd.

- **Conversion of fruit juices**

Acetobacter converts fruit juice to vinegar(acetic acid)

- **Retting of fibres**

Separating fibres of jute.

USEFUL BACTERIA

- **Composting**

Bacteria can be used to convert biodegradable wastes to used as manures.

- **Production of Biogas**

Can be used for cooking, lighting etc.

- **Bacteria in humans and herbivores**

E.Coli in human intestine help in digestion and produce Vit B and Vit K in our body.

- **Nitrogen fixation**
- **Rhizobium bacteria** lives in root nodules of leguminous plants (Symbiosis) and help in conversion of nitrogen into nitrites and nitrates which are soluble forms and are absorbed by plants.

USEFUL BACTERIA

USEFUL BACTERIA AND NITROGEN CYCLE

https://vimeo.com/161008545

HARMFUL BACTERIA

Beneficial and harmful bacteria

BENEFICIAL	HARMFUL
Lactobacillus converts milk to yoghurt and cheese	Pathogenic Bacteria can cause diseases in humans and animals.
Antibiotics can be formed by some microorganisms	Pathogenic Bacteria can cause diseases in plants.
Bacteria in the colon help produce vitamins	Bacteria can cause food spoilage
G.M.O.'s are used to make insulin and other useful compounds	Bacteria can cause tooth decay.
Bacteria are active in the Carbon and Nitrogen Cycles	

HARMFUL BACTERIA

Common Diseases Caused by Bacteria

Disease	Pathogen	Prevention
Tooth decay	*Streptococcus mutans*	Regular dental hygiene
Lyme disease	*Borrelia burgdorferi*	Protection from tick bites
Tetanus	*Clostridium tetani*	Current tetanus vaccination
Tuberculosis	*Mycobacterium tuberculosis*	Vaccination
Salmonella food poisoning	*Salmonella enteritidis*	Proper food-handling practices
Pneumonia	*Streptococcus pneumoniae*	Maintaining good health
Cholera	*Vibrio cholerae*	Clean water supplies

HOME ASSIGNMENTS

Following questions are to be worked out

Q1. Define retting.

Q2. Name the causative bacteria of a) typhoid b) Cholera c) TB.

Q3. Name the bacteria which helps in nitrogen fixation. How they do that function?

Q4. List in a tabular form different category of bacteria and their shape with examples.

Q5.a) What is nucleoid?

b) How bacterial cell wall differs from that of plant cell?

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CLASSIFICATION OF PLANTS
PD 3

SUBJECT : (SCIENCE-BIOLOGY)
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SUBTOPICS

- Kingdom Protista:
- Structure of Amoeba: its locomotion, nutrition, excretion and reproduction

LEARNING OUTCOMES

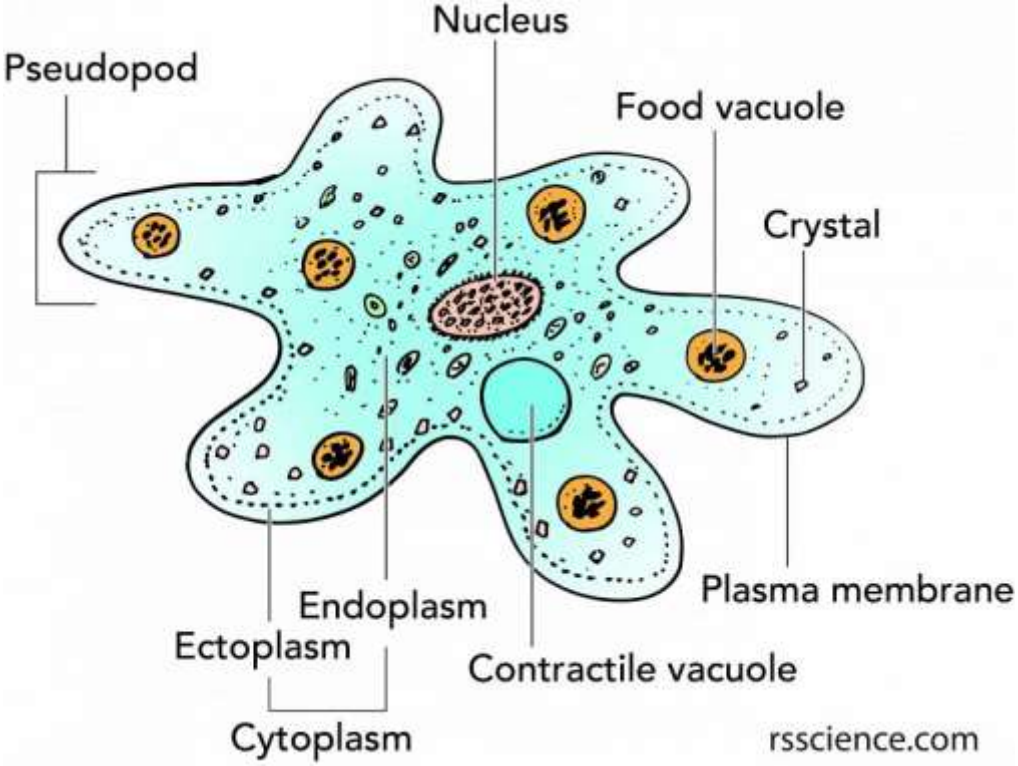
Students will be able to :

- List the characteristics of kingdom Protista.
- Describe Amoeba as an example with its
  - nutrition
  - Locomotion
  - Reproduction
  - Respiration
  - Excretion

GENERAL CHARACTERISTICS OF PROTISTA

- Unicellular eukaryotic organisms(nucleus is surrounded by nuclear membrane)
- Locomotion: By hair-like cilia or whip-like flagella for moving around in some members.
- Nutrition: Autotrophic or heterotrophic.
- Examples: Algae, protozoans (Plasmodium, amoeba)

AMOEBA as a detail example of Protista



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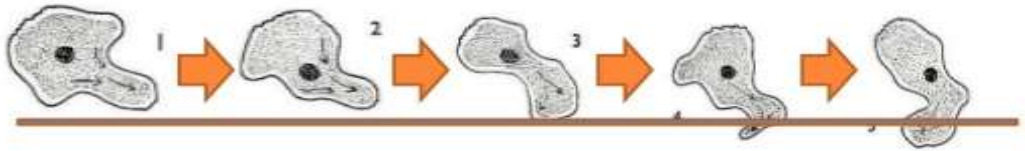
LOCOMOTION IN AMOEBA

Movement of *Amoeba* sp.



- Move by **extending temporary pseusopodia** or 'false foot'
- The rest of **cytoplasm flow slowly** into this extension, hence move the organism along

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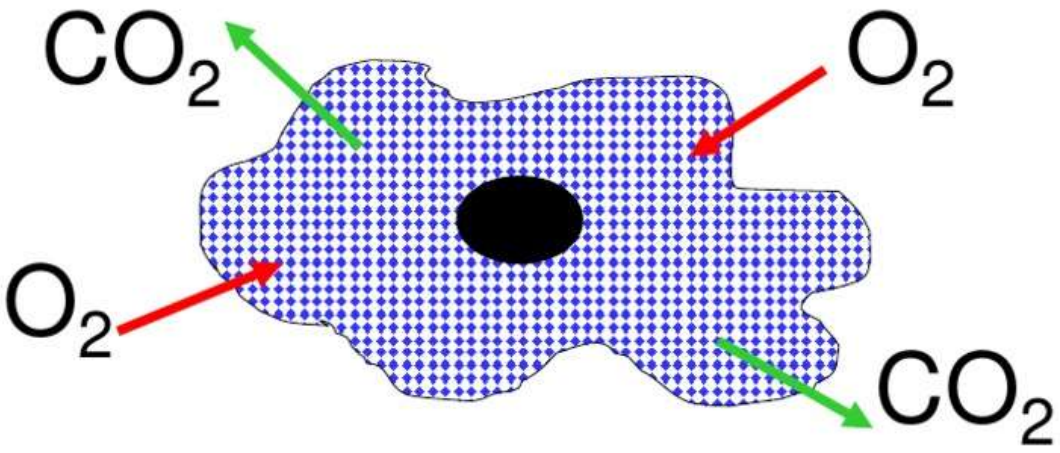
LOCOMOTION IN AMOEBA

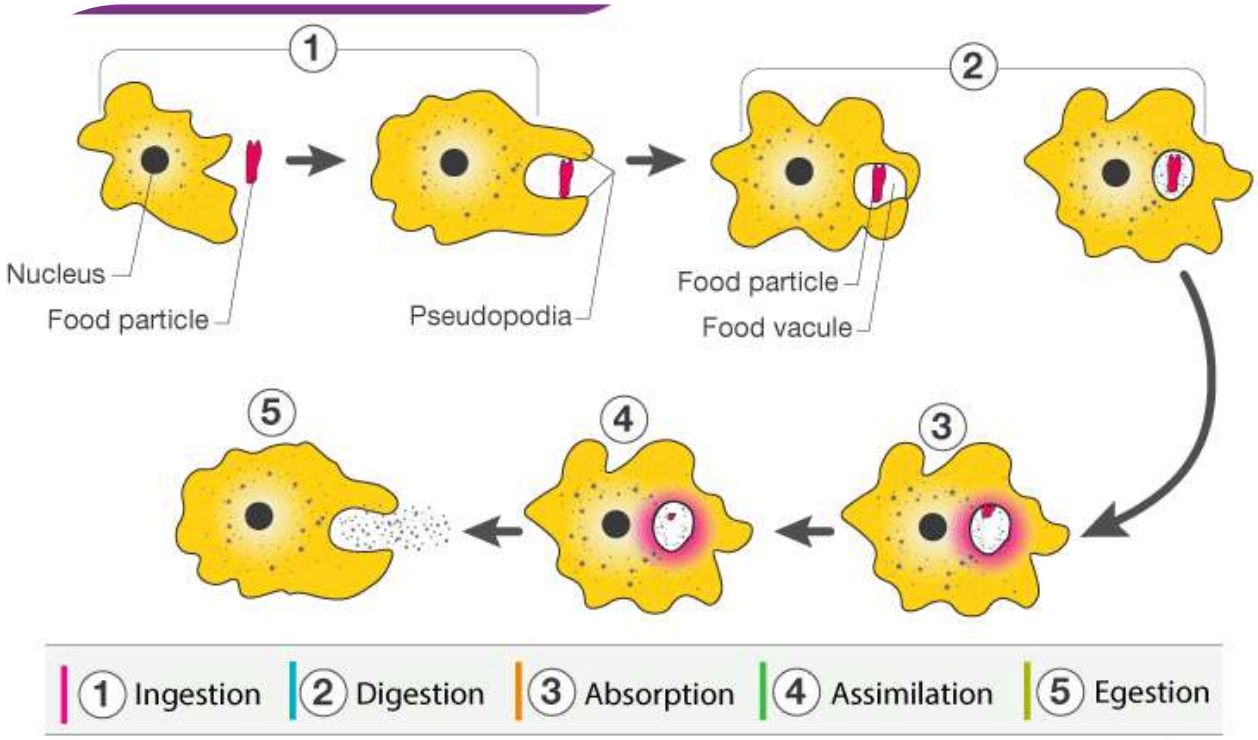
RESPIRATION IN AMOEBA

Respiration of Amoeba sp.

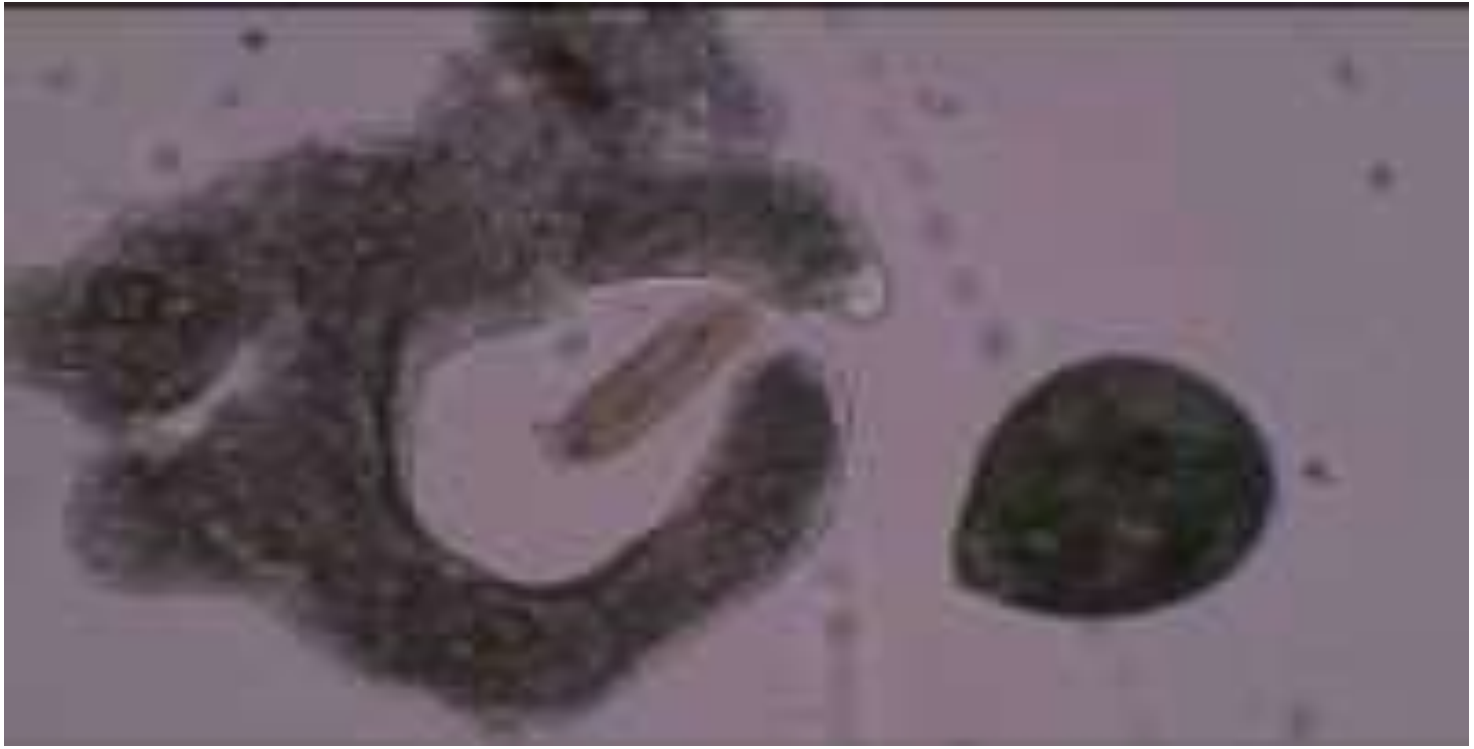


- Exchange of oxygen and carbon dioxide occurs through the plasma membrane.

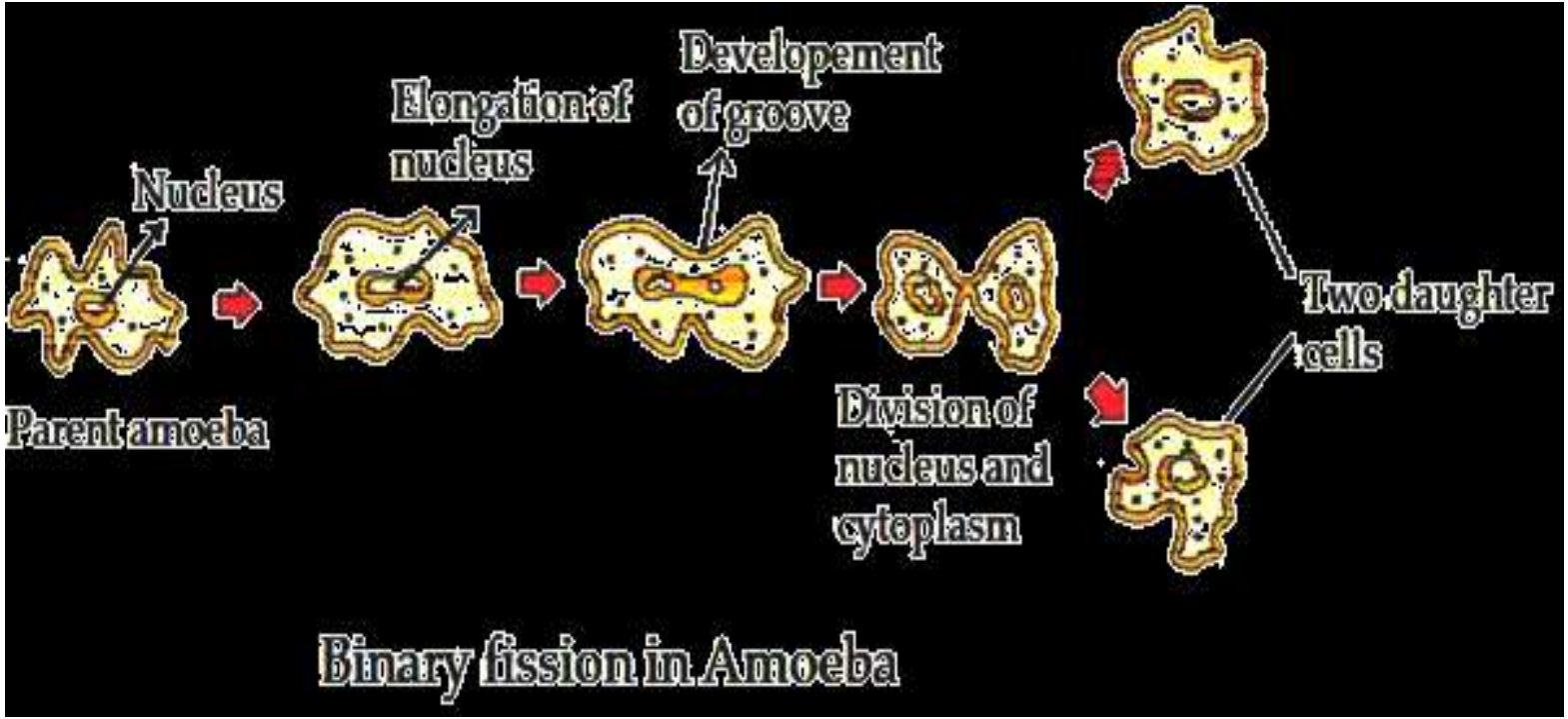
NUTRITION IN AMOEBA



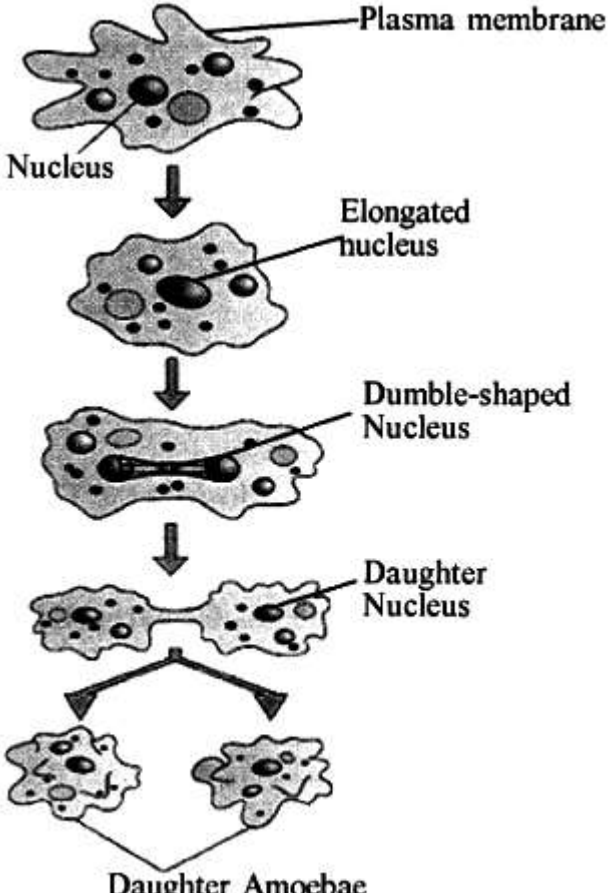
NUTRITION IN AMOEBA



REPRODUCTION IN AMOEBA



REPRODUCTION IN AMOEBA

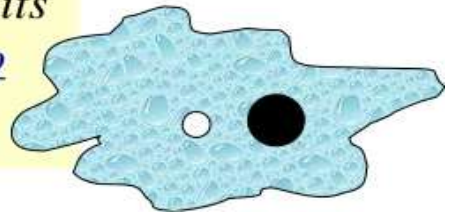


REPRODUCTION IN AMOEBA

EXCRETION IN AMOEBA

Excretion of Amoeba sp.

- *The **contractile vacuole** is involved in osmoregulation.*
- *Water diffuses into the cell and fills the contractile vacuole.*
- *When the vacuole is filled to its maximum size, it contracts to expel its contents.*



HOME ASSIGNMENTS

Following questions are to be worked out

Q1. Briefly describe binary fission in amoeba. How it differs from multiple fission? Explain.

Q2. Give three characteristic features of Protista.

Q3. Differentiate between food vacuole and contractile vacuole on the basis of their function in amoeba.

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CLASSIFICATION OF PLANTS
PD 4

SUBJECT : (SCIENCE-BIOLOGY)
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SUBTOPICS

- Kingdom Fungi:
- Structure of Rhizopus or Bread Mould,
- Useful and Harmful Fungi with suitable examples

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LEARNING OUTCOMES

After completion of the topic students will be able to:

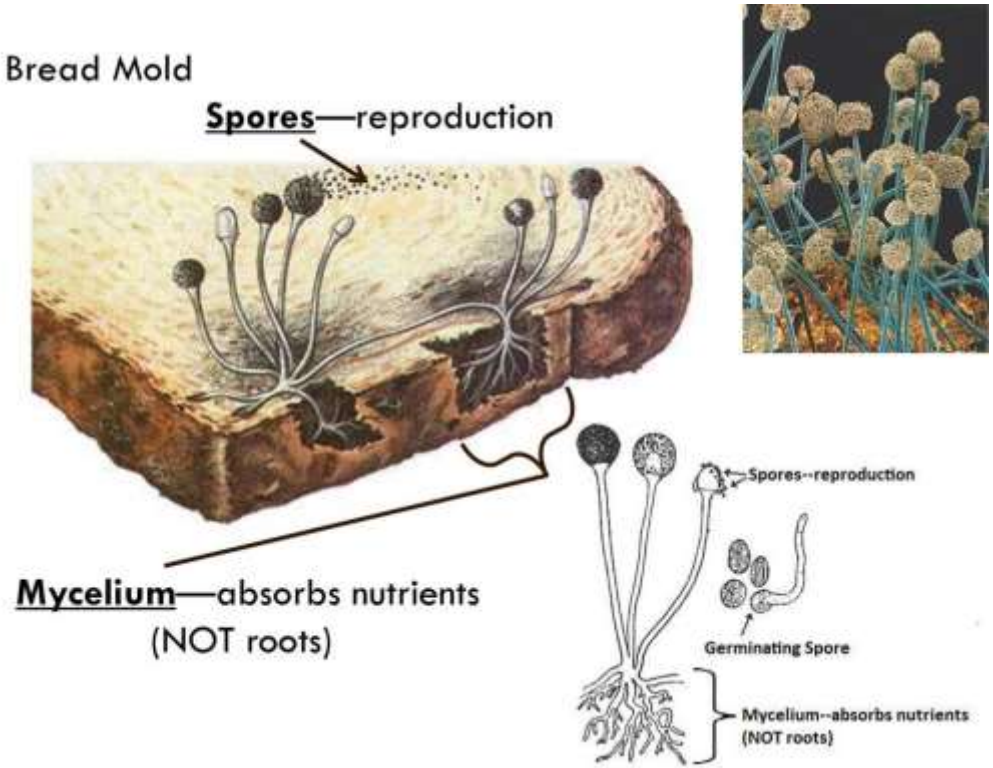
- Identify fungus with their general characteristics.
- Explain the structure of Bread Mould or Rhizopus.

Describe characteristics of Rhizopus in detail

GENERAL CHARACTERISTICS

- They are unicellular or multicellular organisms.
- Mode of nutrition is Saprophytic i,e. they depend on dead and decaying organisms to derive their nutrition.
- They possess cell wall.
- Mostly reproduce by asexual reproduction .eg. Spore formation.

DETAILS OF BREAD MOULD(RHIZOPUS)



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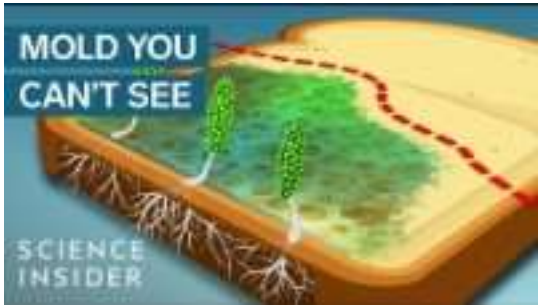
STRUCTURE OF RHIZOPUS

•The body of Rhizopus consists of branched mycelium. It is composed of three types of hyphae(thread like body structure) : stolon, rhizoids and sporangiophores
•**Stolon** is the internodal region, it is aerial, forms an arch and touches the substratum (the substance on which bread mould grows, like bread slices)
•**Rhizoids** are branched, anchor the mycelium(the network of hyphae) to the substratum and absorb food
•**Sporangiophores** are the aerial and reproductive parts.They are branched and consist of sporangiospores at the end.
•The cell wall is made up of chemical chitin.

REPRODUCTION IN BREAD MOULD ,USFUL AND HARMFUL FUNGI



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USEFUL FUNGI

- Used in baking industries- yeast
- Source of food- Morchella, Agaricus
- Vitamin B is produced by Yeast.
- First antibiotic Penicillin was made from fungus. Penicillium.

- Help in ripening of cheese=Mucor and Penicillium
- Act as decomposers and replenish soil nutrients.
- Making of alcohol- Yeast

HARMFUL FUNGI

- Spoilage of food
- Leather good
- Destroys fibers
- Many lungs and skin disease

HOME ASSIGNMENTS

Q1. Explain the structure of Rhizopus in detail.

Q2. Explain the process of digestion in Bread Mould.

Q3. Name the following: a) two edible fungi b) two fungi used in ripening of cheese.

Q4.Name any two diseases caused by fungus.

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CLASSIFICATION OF PLANTS
PD 5

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SUBTOPICS

- Kingdom Plantae: General characteristics as well as division into cryptogams and phanerogams
- a) Thallophyta
- b) Bryophyta
- c) Pteridophyta (general characteristics with examples)

LEARNING OUTCOMES

After completion of the topic students will be able to:

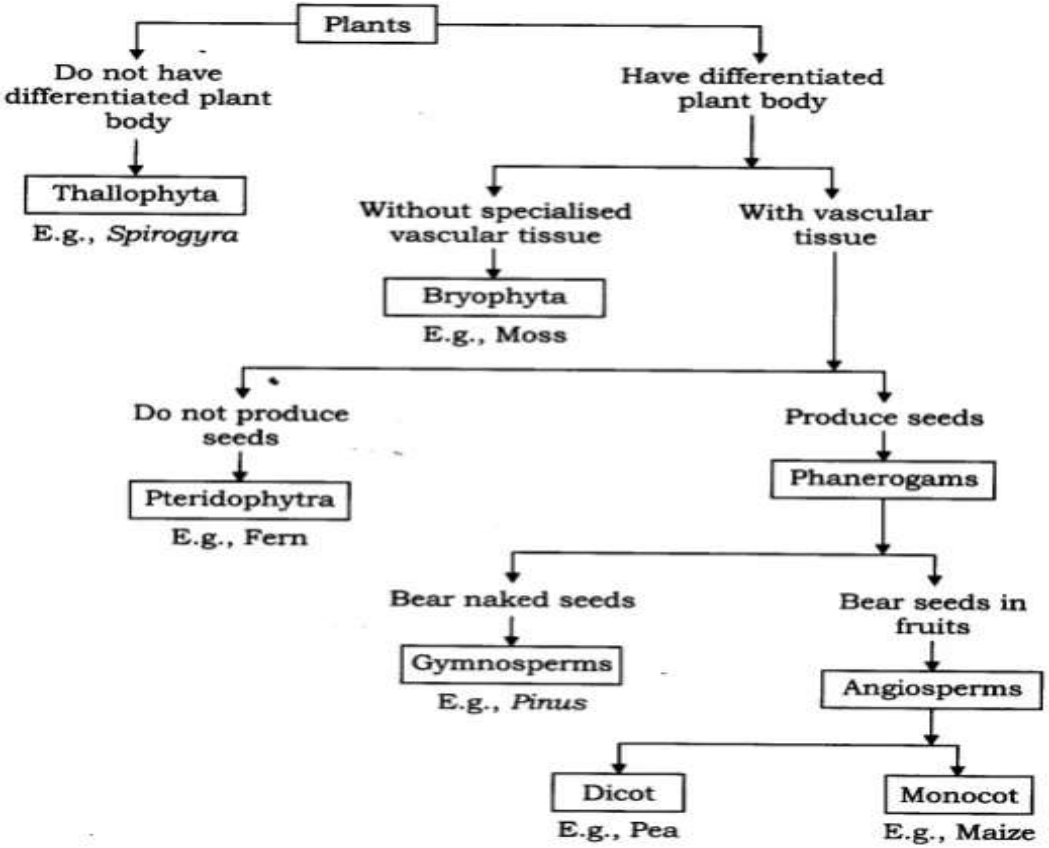
- Describe the plant kingdom in detail ,idea about phanerogams and cryptogams.
- Explain the basis of classification
- List the characteristics of Thallophyta, Bryophyta and Pteridophyta.

CLASSIFICATION IN PLANTS

KINGDOM PLANTAE

- All plants and trees we see around us come under this Kingdom.
- All of them are autotrophic with chloroplast in their cell.
- Their cell wall is made up of cellulose.
- The plant kingdom is classified into two major divisions as Cryptogams(non flowering plants) and Phanerogams(flowering plants)

CLASSIFICATION IN PLANTS



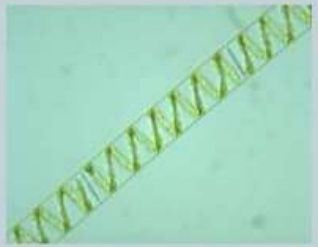
THALLOPHYTA

- They are usually found in moist or wet places.
- Don’t have true roots, no stem or leaves. The whole body is thallus.
- They are autotrophic in nature i.e. prepare their own food by photosynthesis.
- Reserve food is generally starch.
- They have a cell wall composed of cellulose around their cells.
- Unlike other plants, xylem and phloem are absent. etc

THALOPHYTA

EXAMPLES OF TYALLOPHYTA – ALGAE

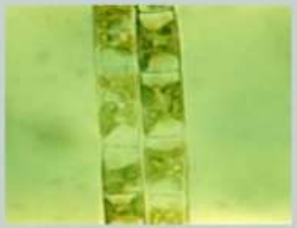
ULVA



SPIROGYRA

CHARA

CLADOPHORA



ULOTHRIX

NEXT

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BRYOPHYTA

- These are the first plants to have differentiated roots(known as rhizoids) and shoots(stem and leaves)
- Known as Amphibians of the plant kingdom as at some stages of life they need water to reproduce, so they grow on moist areas or damp areas.

BRYOPHYTA

BRYOPHYTES

plants

Liverworts

Hornworts

Mosses

PTERIDOPHYTA

- These plants have proper differentiation of roots, stem and leaves.
- They have conducting tissue.
- Do not produce flowers or seeds.
- Reproduce by spores.

PTERIDOPHYTA

HOME ASSIGNMENTS

Q1. How Ferns differ from Mosses? Explain.

Q2. Describe the general characteristics of Pterydophyta.

Q3. How do Ferns reproduce? Explain.

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CLASSIFICATION OF PLANTS
PD 6

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SUBTOPICS

Plant kingdom:

- d) Gymnosperms
- e) Angiosperms (general characteristics with examples)

LEARNING OUTCOMES

After completion of the topic students will be able to:

- Describe the general characteristic of Gymnosperms and Angiosperms with examples.
- Differentiate between Phanerogams and Cryptogams.
- Explain about types of Angiosperms with their division.

Differentiate between dicots and monocots

FLOWERING PLANTS OR PHANEROGAMS: GYMNOSPERMS

Gymnosperms

- Gymnosperm stands for naked seed.
- They are the first phanerogams since they produce seeds, which is not enclosed in a fruit.
- Shed their leaves at one time ,thus are evergreen.

Angiosperms

- They bear flowers and fruits, inside which the seeds are found.
- They are of two types- Monocots or Monocotyledons
  -Dicots or Dicotyledons.

GYMNOSPERMS VS ANGIOSPERMS

Gymnosperms	Angiosperms
Gymnosperms are seed-bearing, non-flowering plants	Angiosperms are flowering plants.
They are more primitive than angiosperms.	They are the most recent and highly evolved group of plants.
Seeds are produced naked i.e., they are not enclosed inside the fruit. Vessels are absent in xylem and companion cells are absent in phloem.	seeds are enclosed inside the fruit. Vessels and companion cells are present.

MONOCOTS VS DICOTS

	Embryos	Leaf venation	Stems	Roots	Flowers
Monocots	 One cotyledon	 Veins usually parallel	 Vascular bundles usually complexly arranged	 Fibrous root system	 Floral parts usually in multiples of three
Dicots	 Two cotyledons	 Veins usually netlike	 Vascular bundles usually arranged in ring	 Taproot usually present	 Floral parts usually in multiples of four or five

HOME ASSIGNMENTS

Following questions are to be worked out

Q1. With reference to number of seeds, venation in leaves and type of roots, differentiate between monocotyledons and dicotyledons plants.

Q2. Give the general characteristics of Gymnosperms and Angiosperms.

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CLASSIFICATION OF PLANTS
PD 7

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SUBTOPICS

RECAPITULATION OF

- Plant kingdom classification

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LEARNING OUTCOMES

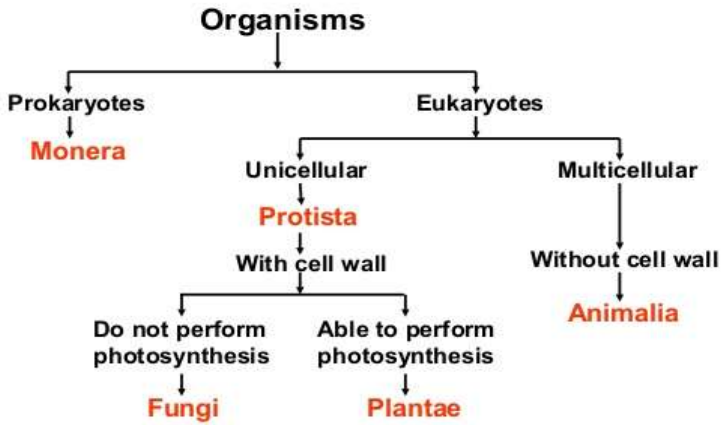
Students will be able to:

- Recall the basis of classification and need of classification of organisms.
- Explain the basis of 5 kingdom of classification.
- General characteristics of different groups.
- Describe plant kingdom in detail.
- Identify the organisms from their features and classify them accordingly.

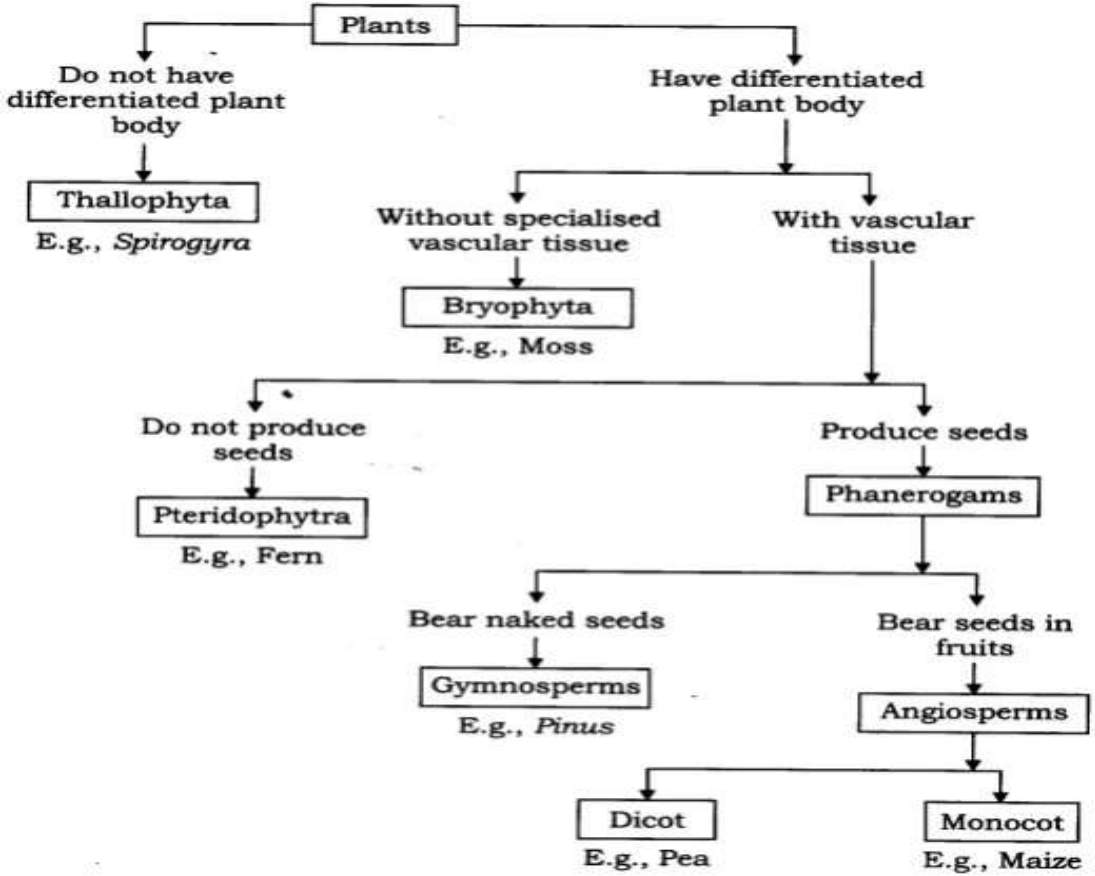
Describe different features of amoeba in detail.

5 KINGDOM CLASSIFICATION IN BRIEF

5) The Five Kingdom classification of living organisms :-



CLASSIFICATION OF PLANTS



CLASSIFICATION IN BRIEF

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CLASSIFICATION IN BRIEF

HOME ASSIGNMENTS

Following questions are to be worked out

Q1. Write the importance of tissues in a living organism.

Q2. Explain the cellular organization in a multicellular organism. How is it helpful to the organisms?

Q3. How do you rank the following with respect to cell, tissue, organ or organ system?

a) Amoeba b) Euglena c) Skin d) Lungs e) Neuron f) Cardiac muscles

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