Characteristics and Life Processes of Living Organisms
Science Four

Related SLO

Students' Learning Outcomes

- **Compare and contrast characteristics that distinguish major groups of living things (plants and animals)**

Living Organisms:

Living organisms are things that grow, change, and need food, water, and air to survive.

Examples:

- Plants
- Animals
- Humans

Groups of Living Organisms:

Living organisms are divided into two major groups.

- **Plants**

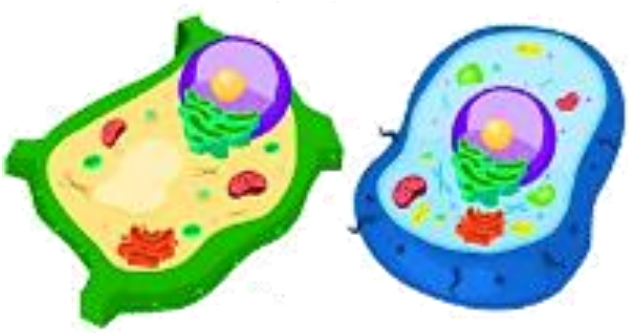
  Plants are living things that grow in soil and make their own food using sunlight.

- **Animals**

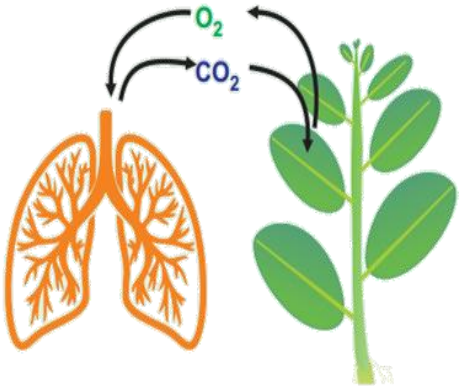
  Animals are living things that can move and eat food.

Characteristics of Plants and Animals:

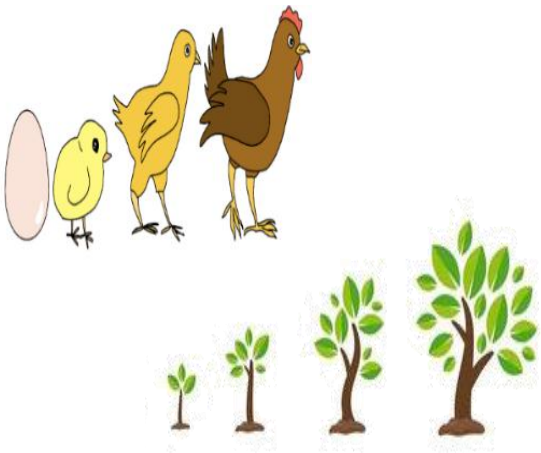
- **Similarities Between Plants and Animals**



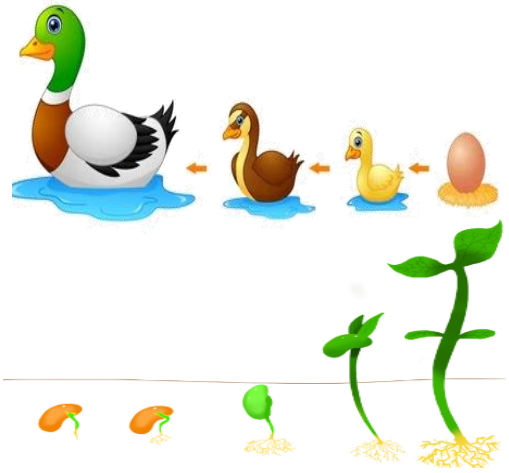
Both are made up of cells, which are the basic units of life



Both can respire



Both grow and develop over time, following a life cycle



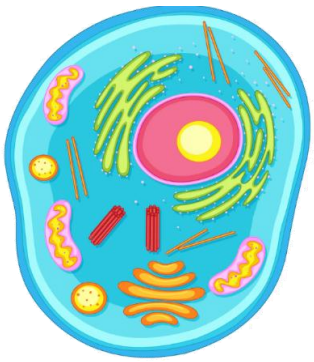
Both can reproduce

- **Differences Between Plants and Animals:**

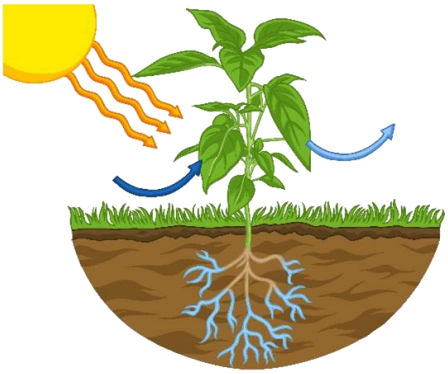
Plants cannot move

Animals can move

A plant cell has a cell wall



An animal cell does not a cell wall



Plants can prepare their own food

Animals cannot prepare their own food

Classification of Animals

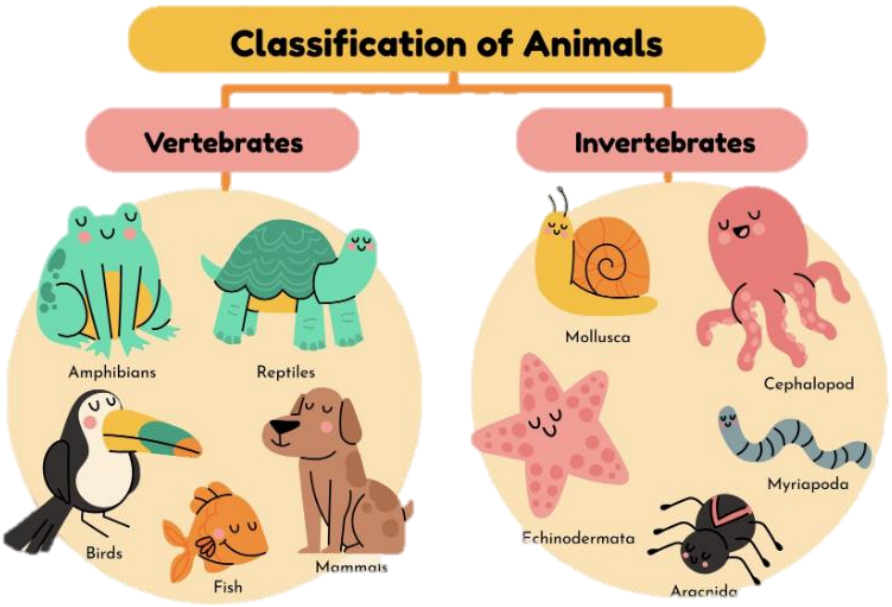
Classification is the process of arranging things into different groups. On the basis of backbone animals are divided into two groups.

- Vertebrates (With backbone)
- Invertebrates (Without backbone)

Related SLO

Students' Learning Outcomes

- **Classify animals in terms of vertebrates and invertebrates with examples and analyze the differences and similarities in vertebrates and invertebrates.**



Vertebrates:

- The animals with a backbone are called vertebrates.
- Most vertebrates have internal skeleton made of bones.
- They have well developed nervous system with brain and spinal cord.

Examples:

- Humans
- Elephant
- Eagle
- Fish
- Frog

Classification of Vertebrates:

The vertebrates are divided into five smaller groups.

- Birds
- Mammals
- Reptiles
- Amphibians
- Fish

1. Birds:

- Birds have wings to fly (not all birds can fly).
- All birds have feathers and beaks.
- They have hollow bones that reduce their weight.
- All birds are warm-blooded animals (They maintain a constant body temperature).

Examples

- Ostrich (Running Bird)
- Eagle
- Parrot

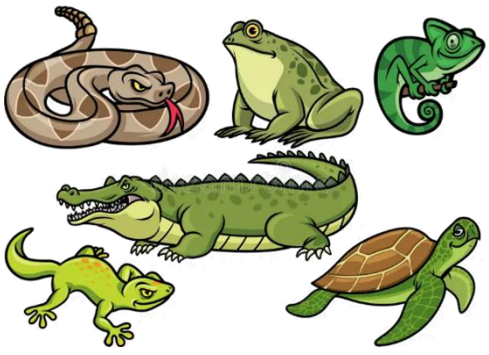
2. **Mammals:**
   - Mammals have hair and fur on their bodies.
   - They give birth to babies.
   - They feed milk to babies.
   - They have lungs to breathe.
   - They maintain a constant body temperature (Warm-blooded)
   - Bats dolphins and whales are also mammals.

Examples

- Humans
- Lions
- Elephant

3. **Reptiles:**
   - Reptiles are crawling animals.
   - They have dry, rough and thick skin.
   - They can change their body temperature. (Cold blooded)

Examples



- Snakes
- Lizards
- Turtles

4. **Amphibians:**
    - The animals which can live both on water and land are called amphibians.
    - Their skin is usually loose and moist.
    - Their body temperature changes with the environment. (Cold blooded)

Examples

- Frogs
- Toads
- Salamanders

5. **Fish**
    - The fish live in water.
    - Fish have special structures called fins which help them to move in water.
    - They have fins to help them move through the water.
    - As the temperature in their surrounding changes, their body temperature also changes, so fish are called cold blooded.

Examples

- Salmon
- Goldfish
- Sharks

Invertebrates:

- The animals without a backbone are called invertebrates.
- About **95% of all the animals** in the animal kingdom are invertebrates.
- They have exoskeleton (external skeleton) made up of chitin.
- There is no such advanced brain.

Examples

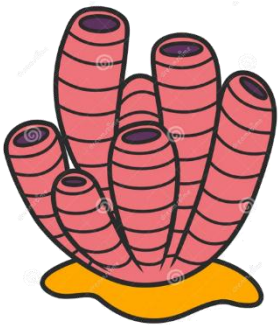
- Butterflies
- Earthworms
- Bees
- Snail
- Jelly fish

Classification of Invertebrates:

Invertebrates are classified into five major groups on the basis of their characteristics.

1. **Sponges**:

- Sponges look like plants but are animals.
- They have many tiny holes (pores) on their bodies.
- They live in water and stay in one place.
- Sponges do not have organs or tissues.

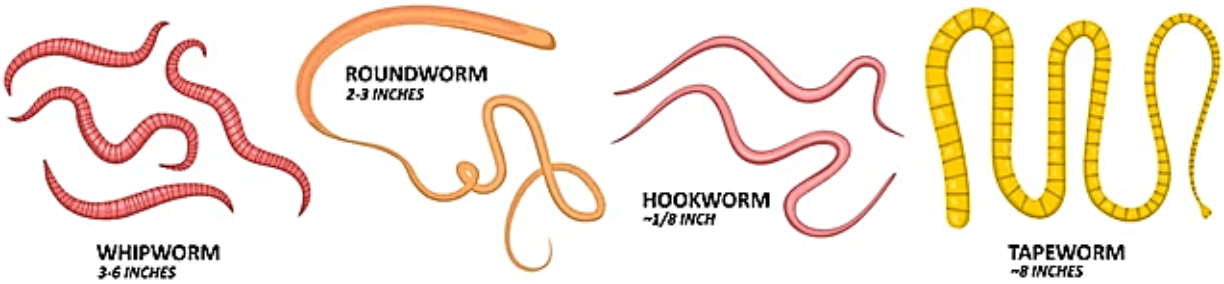


2. **Worms**:

- Worms have long, soft bodies with no bones.
- Worms have different shapes.
- They can live in soil, water, or inside other animals as parasites.

Examples:

- Earthworm
- Flatworm
- Roundworm
- Segmented worm



3. **Insects**:

- Insects have three main body parts: head, thorax, and abdomen.
- They have six legs and often have wings.
- They contain an outer shell called an exoskeleton.

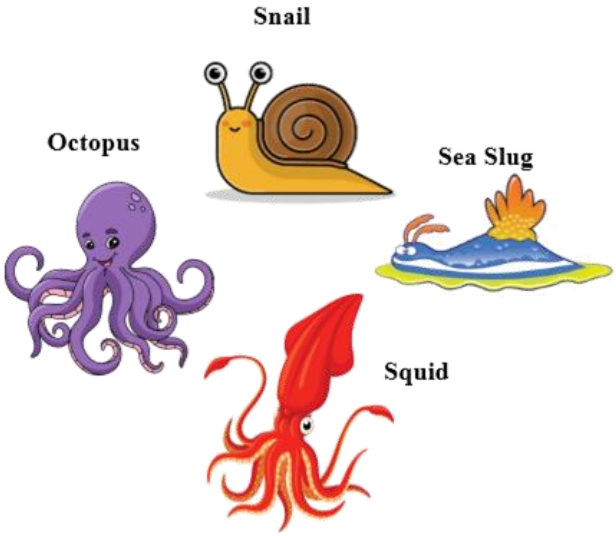
Examples:

- Butterfly
- Grasshopper
- Bee
- Ant

4. **Molluscs**:
    - Molluscs have soft bodies, often with a hard shell.
    - Most have a muscular foot to move.
    - Some have a tongue-like organ with tiny teeth called a radula.

Examples:

- Snail
- Octopus
- Sea slug
- Squid



5. **Echinoderms**:
    - Echinoderms have spiny skin and live in the ocean.
    - They have bodies that are often divided into five parts (like a starfish).
    - Echinoderms have a regenerative ability, allowing them to regrow lost body parts in some species.

Examples:

- Star fish
- Sea urchin
- Sea cucumber

Related SLO

Students' Learning Outcomes

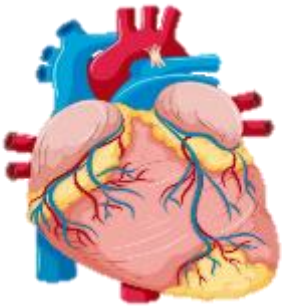
- **Identify major parts and organs in animals (teeth, bones, lungs, heart, stomach, muscles, and brain.**
- **Relate the parts and organs of the body of animals to their functions e.g. teeth breakdown food, bones support the body, lungs take air in, the heart circulates blood, the stomach helps to digest food, muscles move the body.**

Major Organs in Animals:

An organ is a group of tissues that perform a specific function in the body.

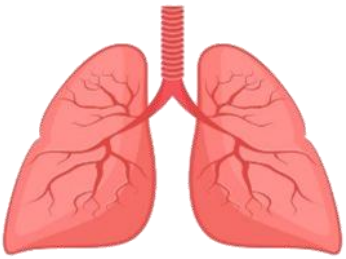
1. **Heart:**

   Heart is located in front of the chest on left side. The heart pumps blood and distributes oxygen and nutrients throughout the body.



2. **Lungs:**

   Lungs are located in chest, behind the heart. They help in breathing. by taking oxygen inside the body and gives the carbon dioxide out.

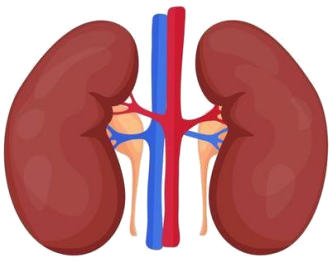


3. **Brain:**

   Brain controls all the activities of the body. It is located inside the head protected by skull.

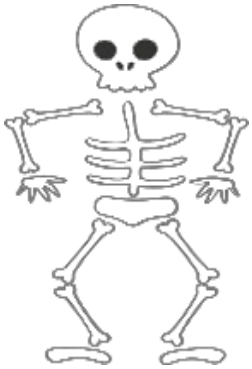
4. **Kidneys:**

   They are located just below the rib cage one of each side of spine. Kidneys remove waste and extra fluid from the body.



5. **Bones:**

   Bones are present in the whole body. Bones support and shape the body. Without bones you will not stand.



6. **Stomach:**

   Stomach stores the food we eat and releases digestive juices and acids. It breakdown the food into smaller pieces to get nutrients.

7. **Muscles:**

   Muscles are found in the whole body, attached to bones. Muscles support movement in our body.

8. **Teeth:**

Teeth are hard structures in mouth that help to chew food.

Functions of teeth

- Breakdown of food.
- Help us to speak.
- Shape the face.

Classification of Plants:

On the basis of flowers plants are classified into two types.

- Flowering Plants
- Non-flowering plants.

Related SLO

Students' Learning Outcomes

- **Classify plants in terms of flowering and non-flowering with examples and analyze the differences and similarities in flowering and non-flowering plants.**

Flowering plants:

Plants that produce flowers are called flowering plants. They produce seeds inside their flowers or fruits. These seeds can grow into new plants.

Examples:

Rose

Sunflower

Tulip

Daffodil

Non-flowering plants:

Plants that do not produce flowers are called non-flowering plants. Instead of seeds, they might use spores (tiny cells that can grow into new plants) or cones (like pine cones) to reproduce.

Examples:

Ferns

Mosses

Conifers

Liverwort

Parts of Plant and their Functions:

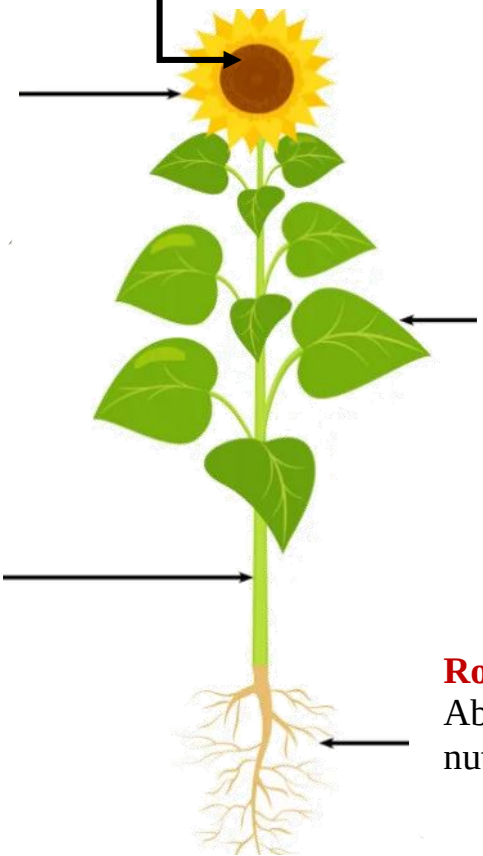
Related SLO

Students' Learning Outcomes

- **Identify parts of a plant body, (leaves, stem, flowers, seeds, roots)**
- **Relate structure s of plants to their functions i.e., roots absorb water and nutrition and anchor the plant, leaves make food the stem transport water and food, flowers produce seeds and seed produce new plants.**

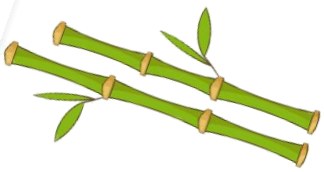
Seeds:
Seeds help plants grow new baby plants.

Flower:
Attracts pollinators and produces seeds.



Leaves:
Leaves are responsible for the process of photosynthesis which make food.

Stem:
Supports the plant and carries water and nutrients to the leaves.



Roots:
Absorb water and nutrients from the soil.

Diversity:

Diversity means the variety of different elements, such as plants, animals.

Related SLO

Students' Learning Outcomes

- **Recognize and appreciate diversity in life (both plants and animals) and identify ways to protect diversity.**

Diversity in Plants:

In the world of plants, there are tall trees like oak trees, colorful flowers like roses, small bushes like lavender, and soft grass that grows on the ground.

Diversity in Animals:

Animals are diverse too. There are pets like dogs and cats, farm animals like cows and chickens, wild animals like lions and elephants, and sea animals like fish and whales. Each animal has its own special traits that help it survive in its home,

Importance of Diversity:

Diversity in plants and animals keeps nature balanced. They are essential for a balanced ecosystem, providing food, clean air, and supporting each other. They help maintain nature's health and stability.

Ways to Protect Diversity:

Plant more trees

Stop hunting of animals

Stop cutting trees

Stop destroying habitats