Diversity in the Living Organisms

Classification of Plants based on Height of Stems

What is it?

Plants show a great variety in their size, shape and structure. Based on the height of their stems, plants can be grouped into five types: **herbs**, **shrubs**, **trees**, **creepers** and **climbers**.

Herbs

- Small plants with soft, green and tender stems.
- Usually short in height.
- Live for a short period (annual or biennial).



Spinach Coriander Grass

Examples: Spinach, coriander, grass, mint, wheat, rice.

Shrubs

- Medium-sized plants.
- Stems are woody and hard (not very thick).
- Many branches arise from the base.



Hibiscus Rose Jasmine

Examples: Hibiscus, rose, jasmine, cotton, tea.

Trees

- Tall plants with a single, thick, hard woody stem (trunk).
- Branches arise much higher from the ground.
- Live for many years.



Mango Coconut Neem

Examples: Mango, coconut, neem, peepal, banyan.

Creepers

- Weak, slender stems.
- Cannot stand upright.
- Spread on the ground with the help of support or by their own tendrils.



Pumpkin Watermelon Money plant

Examples: Pumpkin, watermelon, strawberry, money plant.

Climbers

- Slender, weak stems.
- Take support to grow upwards.
- Use tendrils, hooks or twining stems to climb.

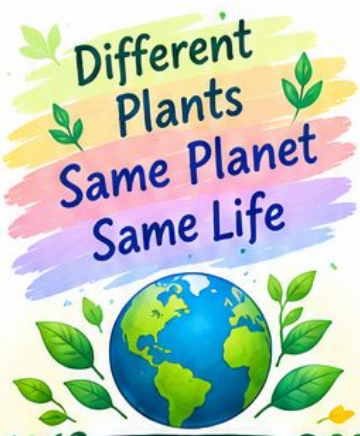


Bean Grapevine Morning glory

Examples: Bean, grapevine, money plant, morning glory.

Remember!

- ✓ Plants can be classified based on the height of their stems.
- ✓ Each type has unique features and adaptations to survive.
- ✓ All plants are important for our life and environment.



Did You Know?

- **Herbs** are usually found in kitchen gardens and fields.
- **Shrubs** help prevent soil erosion with their dense roots.
- **Trees** provide oxygen, shade, food and shelter.
- **Creepers** and climbers help plants reach sunlight.

LEAVES HAVE DIFFERENT VENATION

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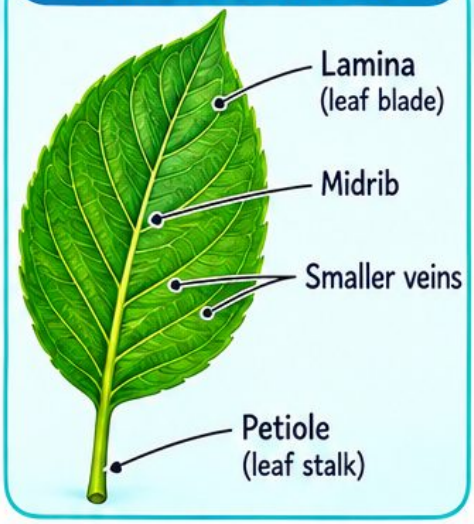
WHAT IS VENATION?

Venation is the arrangement of veins and veinlets in the leaf lamina.

TWO MAIN TYPES

1. Reticulate venation
2. Parallel venation

PARTS OF A LEAF



TYPES OF VENATION

1 Reticulate venation

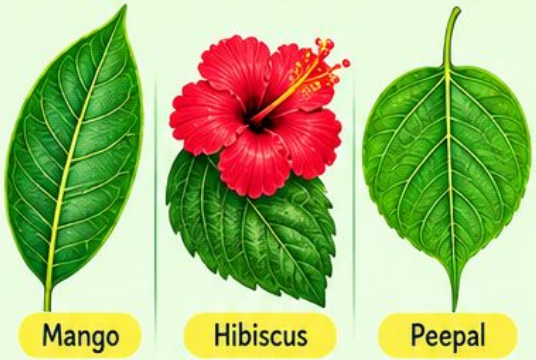
- Veins form a net-like pattern.
- Common in mango, hibiscus and peepal.

2 Parallel venation

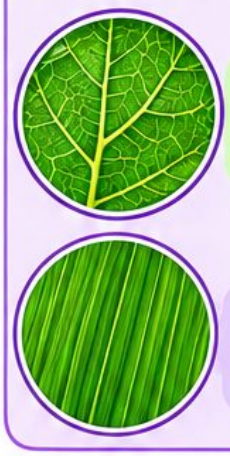
- Veins run parallel to one another.
- Common in grass, banana and maize.

RETICULATE VENATION

Examples: Mango, Hibiscus, Peepal



LET'S COMPARE



Net-like veins (reticulate)

Parallel veins (parallel)

PARALLEL VENATION

Examples: Grass, Banana, Maize



TRY IT!

1. Observe leaves around you.
2. Trace their veins.
3. Group them by venation (reticulate or parallel).



OBSERVATION (Usually)

Plants with reticulate venation **usually** have a taproot system, while plants with parallel venation usually have a fibrous root system.



Taproot system (reticulate venation)

Fibrous root system (parallel venation)

REMEMBER

Venation is the pattern of veins in a leaf.

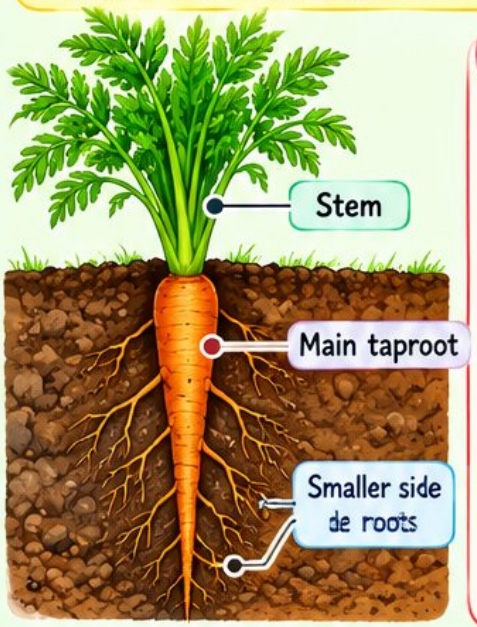


TYPES OF ROOTS

Roots anchor the plant • Absorb water and minerals

TAPROOT

A taproot is a single, thick main root that grows deep into the soil. It has smaller side branches.



Examples


Carrot


Radish

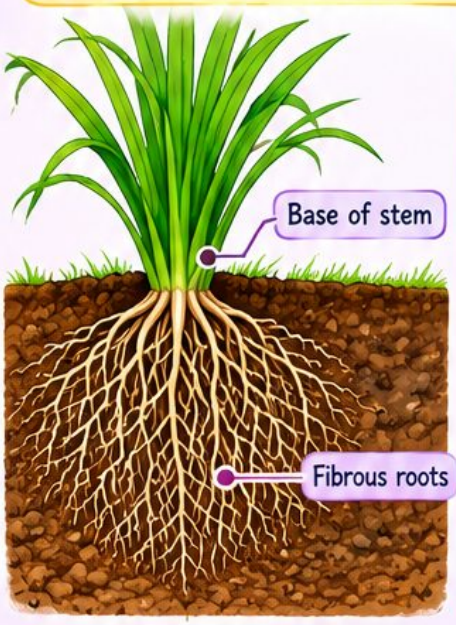

Beetroot

Key features

- One main root, larger than the others.
- Grows deep into the soil.
- Helps in storage of food (in some plants).
- Examples: carrot, radish, beetroot, turnip.

FIBROUS

A fibrous root system has many thin roots of almost equal size. They grow near the surface of the soil.



Examples


Grasses


Onion


Wheat

Key features

- Many thin roots of similar size.
- Spread near the surface of the soil.
- Help in absorption of water and minerals from a large area.
- Examples: grasses, onion, wheat, maize.

Quick Comparison

	Taproot	Fibrous
1 Main root	Single, thick main root	Many thin roots
2 Growth	Grows deep into the soil	Grows near the surface
3 Examples	Carrot, radish, beetroot, turnip	Grass, onion, wheat, maize
4 Function	Absorption and storage (of food in some plants)	Absorption of water and minerals from a large area

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TYPES OF COTYLEDONS

AND RELATION BETWEEN LEAF VENATION, ROOTS AND COTYLEDONS

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WHAT ARE COTYLEDONS?

- Cotyledons are the seed leaves present in the seed of a plant.
- They contain stored food for the developing embryo.
- They are the first leaves to appear when the seed germinates.

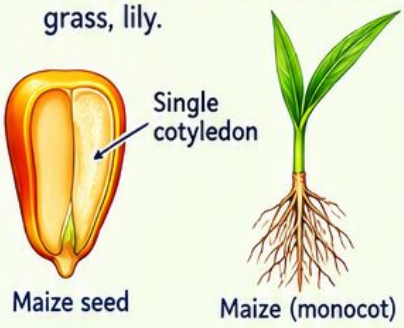
COMPARISON

Feature	Monocotyledons	Dicotyledons
Number of cotyledons	One	Two
Example	Maize, rice, wheat, grass	Bean, pea, groundnut
Leaf venation	Parallel	Reticulate
Root system	Fibrous	Tap root

TWO TYPES OF COTYLEDONS

1 MONOCOTYLEDONS

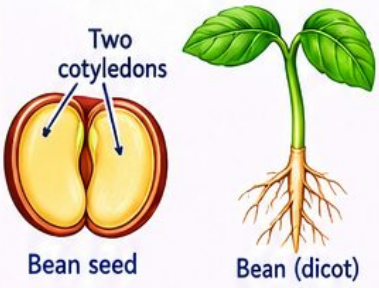
- Have one cotyledon.
- Example: Maize, rice, wheat, grass, lily.



Fibrous root system

2 DICOTYLEDONS

- Have two cotyledons.
- Example: Bean, pea, groundnut, sunflower, tomato.



Tap root system

TYPES OF LEAF VENATION

Parallel venation



- Veins run parallel to each other.
- Seen in monocots (e.g., maize, grass).

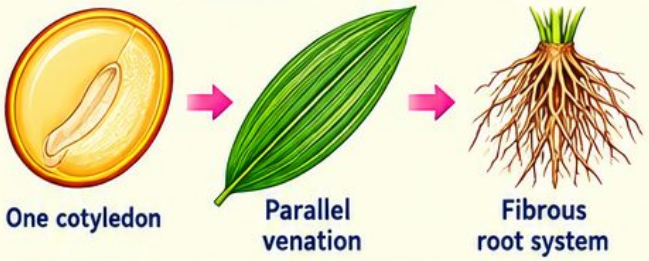
Reticulate venation



- Veins form a network (net-like pattern).
- Seen in dicots (e.g., bean, mango).

RELATION BETWEEN LEAF VENATION, ROOTS AND COTYLEDONS

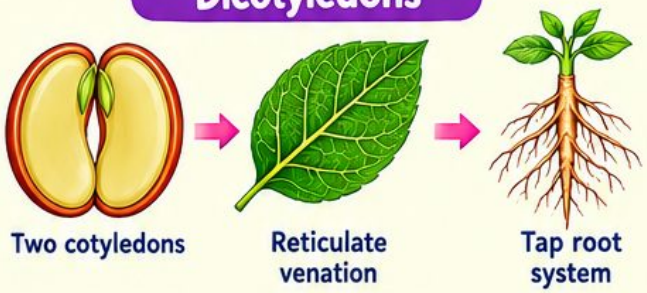
Monocotyledons



- Have one cotyledon.
- Show parallel venation in leaves.
- Have fibrous root system.

Example: Maize, rice, wheat, grass, lily.

Dicotyledons



- Have two cotyledons.
- Show reticulate venation in leaves.
- Have tap root system.

Example: Bean, pea, groundnut, sunflower, tomato.

DIVERSITY IN ANIMALS

Different kinds • Different features • One wonderful world

What is Diversity in Animals?

- Animals are found in almost every habitat on Earth – land, water and air.
- They show a great variety in their body structure, shape, size, colour and habits.
- This variety is called **diversity in animals.**



Animals Live in Different Habitats



Terrestrial (land) – lion, elephant, deer



Aquatic (water) – fish, whale, octopus



Amphibian (land and water) – frog, toad



Aerial (air) – bird, bat, butterfly

Grouped by Body Structure



Vertebrates – backbone present (e.g., fish, frog, lizard, bird, mammal)



Invertebrates – no backbone (e.g., insects, spiders, worms, molluscs)

Different Groups of Animals

Mammals (warm-blooded, give birth to young ones)



Elephant, dolphin

Birds (feathers, lay eggs)



Peacock, sparrow

Reptiles (dry scaly skin, lay eggs)



Snake, lizard

Amphibians (moist skin, live in water and land)



Frog, salamander

Fishes (live in water, use gills)



Rohu, tuna

Variety in Body Features



Size From tiny insects to large whales.



Shape Streamlined, flat, round, long, etc.



Colour Helps in camouflage, warning or attraction.



Special features Webbed feet, sharp claws, long beaks, wings, etc.

Adaptations for Survival



Camouflage Helps to blend with surroundings.



Mimicry Looks like another organism for protection.



Sharp features Helps in hunting and defence.



Special organs Helps to survive in extreme conditions (e.g., camel's hump, kangaroo's pouch).

Why is Diversity Important?

- Keeps the balance in nature (maintains food chains and food webs).
- Helps in different ecological roles (e.g., pollination, seed dispersal, soil fertility).
- Provides resources for humans (food, medicine, clothing, transport).
- Makes our planet more colourful, beautiful and resilient.



Different animals... Different lives... Same planet... Our home!

Habitats and Types

A habitat is the natural home of an organism where it gets food, water, shelter and space to live.

Key Points

- Different organisms live in different habitats.
- Habitats provide the basic needs for living.
- Each habitat has unique physical conditions like climate, water, soil, light and temperature.

Types of Habitats

Broadly, habitats are of two types:

1. Terrestrial habitats
2. Aquatic habitats



Terrestrial Habitats

Terrestrial habitats are land habitats. They are found on the earth's surface.

Examples of terrestrial habitats



Ferest
(deer, tiger, squirrel)



Grassland
(lion, zebra, grasshopper)



Desert
(camel, lizard, cactus)



Mountains
(yak, mountain goat, plants)

Aquatic Habitats

Aquatic habitats are water habitats. They are found in water bodies.

Examples of aquatic habitats



Ocean
(fish, sea turtle, shark)



Rivers and Lakes
(fish, frog, water plants)



Ponds
(frog, insects, plants)



Wetlands
(crab, water birds, reeds)

Remember!

- Terrestrial habitats are on land.
- Aquatic habitats are in water.
- All living things depend on their habitat for survival.

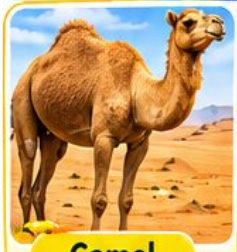


ANIMALS AND PLANTS FOUND IN DESERTS

(Class 6 – NCERT Science)

ANIMALS OF DESERTS

- Desert animals have adaptations to survive in extreme heat and lack of water.
- They get water from food, store fat and stay cool in different ways.



Camel

- Stores fat in hump.
- Can go long without water.
- Has broad feet to walk on sand.



Fennec fox

- Large ears help in losing heat.
- Nocturnal (active at night).



Desert lizard

- Conserves water.
- Can live in high temperatures.
- Blends with the surroundings.



Sand grouse

- Gets water from seeds.
- Can go long without water.



Scorpion

- Nocturnal.
- Lives in burrows.
- Has a hard outer covering to prevent water loss.



Rattlesnake

- Avoids extreme heat by staying in burrows.
- Has venom for prey and protection.

PLANTS OF DESERTS

- Desert plants have special adaptations to survive with little water.
- They store water, have small leaves or spines, and deep roots.



Cactus

- Stores water in stem.
- Leaves are modified into spines.
- Reduced water loss.



Date palm

- Deep roots.
- Provides food, shade and water for desert life.



Acacia

- Deep roots.
- Small leaves.
- Provides gum, food and shade.



Aloe vera

- Stores water in fleshy leaves.
- Helps in healing and survival.



Desert grass

- Long roots.
- Survives in low rainfall.



Mesquite

- Deep roots.
- Small leaves.
- Grows in dry areas.

KEY ADAPTATIONS

- ✓ Conserve water
- ✓ Stay cool (shade, burrows, nocturnal)
- ✓ Store fat or water
- ✓ Have special body features (spines, broad feet, long roots)

REMEMBER

Deserts are home to unique animals and plants that have amazing ways to survive in harsh conditions.

DID YOU KNOW?



Deserts receive very little rainfall, but life still thrives there!

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ADAPTATION IN CAMEL

Living in Desert vs Living in Cold Desert (Ladakh)

Camel in Hot Desert (e.g., Rajasthan)



Camel in Cold Desert (e.g., Ladakh)



Camel in Hot Desert (e.g., Rajasthan)		Camel in Cold Desert (e.g., Ladakh)
 • Long legs • Help to keep the body away from hot sand and ground.	HEIGHT OF LEGS	 • Shorter legs • Help to conserve body heat and move easily on rocky, cold terain.
 • One hump • Stores fat, which provides energy and helps to survive for long periods without food and water.	HUMP	 • Two humps • Store more fat to provide extra energy and help in cold conditions.
 • Short, thin hair • Helps to release heat and stay cool in hot climate.	HAIR	 • Long, thick, woolly hair • Provides insulation and keeps the body warm in cold climate.

Both are camels...

But they have different adaptations to survive in different environments.