The Shoot System

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The shoot system is the aerial part of the plant body that enables a plant to grow taller, receive sunlight, and prepare food. It consists of erect stems to which leaves, flowers, fruits, branches, and buds are attached. The points where leaves attach to the stem are called nodes.

The Stem

The stem is an essential part of the plant that supports the upper plant structures. It performs multiple vital functions:

- Support: Provides structural support to the plant.
- **Transport:** Carries water and nutrients from the roots to the leaves and transports food from the leaves to other parts of the plant.
- **Storage:** Some underground stems store food (e.g., sugarcane, potato, ginger).

Types of Stems:

- i. **Strong, thick, and woody stems:** Found in large trees such as neem, mango, and peepal. The main stem of such trees is called the trunk.
- ii. Thin and hard stems: Found in bushes like rose and hibiscus.
- iii. Thick but soft stems: Found in plants like banana.
- iv. Soft and green stems:
 - Herbs: Examples include tomato and mint.
 - Climbers and Creepers:
 - **Creepers:** Spread on the ground (e.g., watermelon, strawberry, pumpkin).
 - **Climbers:** Require support to grow upwards (e.g., money plant, cucumber, pea plant).

Interesting Fact:

The tallest tree recorded was an Australian eucalyptus, which reached 435 feet in height (measured in 1872).

Functions of the Stem

• Provides support to the plant above the ground.

- Bears branches, leaves, buds, flowers, and fruits.
- Transports water and minerals from roots to the rest of the plant.
- Distributes food produced by the leaves to different plant parts.
- Some stems store food, such as in sugarcane, potato, and ginger.

The Leaf

Leaves come in various shapes and sizes and are crucial for food production in plants. Due to this function, they are called the kitchen of the plant. Leaves are green because of the presence of chlorophyll, which absorbs sunlight for photosynthesis. The outer surface of a leaf has a waxy coating that protects it.

Parts of a Leaf:

Lamina (Leaf Blade): The flat surface of the leaf with veins running across it.

Midrib: The main vein running through the center of the leaf.

Side Veins: Thinner tubes branching from the midrib to distribute water and food.

Leaf Stalk (Petiole): Attaches the leaf to the stem or branch.

Stomata: Tiny openings on the leaf surface that help in gas exchange (visible under a microscope).

Functions of the Leaf:

- **Photosynthesis:** Leaves manufacture food for the plant by converting sunlight into energy.
- Oxygen Release: Leaves release oxygen as a byproduct of photosynthesis, which is essential for living beings.
- Food Storage: Some leaves store food, such as mint and cabbage.

Did You Know?

Plants need minerals from the soil to grow:

- Nitrogen helps plants grow and make leaves.
- Phosphorus promotes strong root development.
- Potassium aids in fruit production and overall plant health.