Topic: Movement

Subtopics:

1. **Cyclosis**
2. **Organelles for Movement**
3. **Auxin-Regulated Growth Movement (Tropic Movements in Plants)**

Class: SS1

Term: First Term

Duration: 40 Minutes

Lesson Objectives:

By the end of this lesson, students should be able to:

1. Explain **cyclosis** and its role in cell movement.
2. Identify **organelles used for movement** in unicellular and multicellular organisms.
3. Describe how **auxins regulate plant movements** (tropic responses).

Introduction:

Movement is one of the basic features of living things.
Movement can happen:

- **Within the cell** (internal movement of substances)
- **Outside the cell** (movement of the entire organism or part of it)

Plants and animals have different ways of moving.
In this lesson, we will learn about **cyclosis, organelles for movement, and auxin-controlled plant movements**.

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1. Cyclosis (Cytoplasmic Streaming)

Definition:

Cyclosis, also called **cytoplasmic streaming**, is the **movement of cytoplasm and cell organelles within the cell**.

How Cyclosis Works:

- The **cytoplasm circulates** around the cell.
- This movement **transports nutrients, wastes, and organelles** to different parts of the cell.
- Helps the cell **maintain balance and perform metabolism**.

Examples of Cyclosis:

Organism/Cell	Description
Amoeba	Cyclosis helps in moving food particles and organelles inside the cell.
Elodea (Water Plant)	Chloroplasts are seen moving in the cell under a microscope due to cyclosis.
Paramecium	Uses cyclosis to distribute food particles in the cytoplasm.

Importance of Cyclosis:

- Helps in **transport of materials** inside the cell.
- Aids in **digestion, excretion, and movement of organelles**.
- Ensures that **nutrients reach all parts** of the cell.

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2. Organelles for Movement

Certain **organelles (structures inside or outside cells)** are specialized for **movement**.

A. Flagella

Definition:

Flagella are **long, whip-like structures** that help in **swimming movement** of some cells and microorganisms.

Examples:

Organism/Cell	Function of Flagella
Euglena	Moves using one long flagellum
Sperm cell	Uses flagellum to swim towards egg
Some bacteria	Use flagella to move in water

B. Cilia

Definition:

Cilia are **short, hair-like structures** that cover parts of the cell and **move in coordinated waves** to cause movement.

Examples:

Organism/Cell	Function of Cilia
Paramecium	Moves using many tiny cilia
Human respiratory tract	Cilia move mucus and dust out of airways

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C. Pseudopodia (False Feet)

Definition:

Pseudopodia are **temporary projections of the cell membrane and cytoplasm** used for **movement and feeding**.

Examples:

Organism	Use of Pseudopodia
Amoeba	Crawls by extending pseudopodia
White blood cells	Use pseudopodia to capture germs (phagocytosis)

Summary of Organelles for Movement:

Organelle	Structure	Example
Flagella	Long and whip-like	Euglena, Sperm cell
Cilia	Short and hair-like	Paramecium, human airways
Pseudopodia	Temporary projections	Amoeba, White blood cells

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3. Auxin-Regulated Growth Movement (Tropic Movements in Plants)

Definition of Tropic Movement:

Tropic movement is the **growth of plant parts in response to external stimuli**, controlled by **plant hormones** called **auxins**.

What are Auxins?

- **Auxins** are **plant hormones** that promote **cell elongation (growth)**.
- They are **produced in the tips of shoots and roots**.

How Auxins Work in Plant Movement:

- Auxins **move to the side of the plant away from light or gravity**.
- They cause **cells on one side to grow faster**, making the plant bend.

Types of Tropic Movements:

Type	Stimulus	Response
Phototropism	Light	Shoots bend **towards light** (positive phototropism), roots grow away (negative phototropism)
Geotropism	Gravity	Roots grow **downwards** (positive geotropism), shoots grow upwards (negative geotropism)
Thigmotropism	Touch	Tendrils of climbing plants wrap around objects

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Importance of Auxin-Regulated Growth:

- Helps plants **find light for photosynthesis**
- Anchors plants by growing roots deeper into soil
- Supports climbing plants in finding support structures

Diagram Suggestion (for student notebook):

- Draw a plant bending towards light showing **auxin concentration on the shaded side**.
- Draw roots growing downward in response to gravity.

Conclusion:

Movement is essential for **cells and organisms**:

- **Cyclosis** moves materials within the cell.
- **Flagella, cilia, and pseudopodia** help cells or small organisms move.
- **Auxins control growth movements** in plants (tropic responses).