



## **Plant Environment Abiotic Factors:**

# **Sunlight and Its Effects on Plants**

**Second lecture**

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## Plant Environment Abiotic Factors:

### Introduction to Abiotic Factors

- **Definition:** Sunlight is the primary energy source for photosynthesis, and it is a critical abiotic factor influencing plant life.

- **It affects** photosynthesis, growth, flowering, and overall plant health.

**Different plants require** varying levels of sunlight for optimal growth.



## Plant Environment

### Abiotic Factors:

## Importance of Sunlight for Plants

- 1. Primary Energy Source:** Provides energy for photosynthesis.
- 2. Regulates Growth:** Affects plant height, leaf size, and stem development.
- 3. Influences Reproduction:** Triggers flowering and seed germination.
- 4. Impacts Plant Distribution:** Determines where plants can grow successfully.



## Plant Environment Abiotic Factors:

### Photosynthesis

❖ **Definition:** The process by which plants convert sunlight into energy.

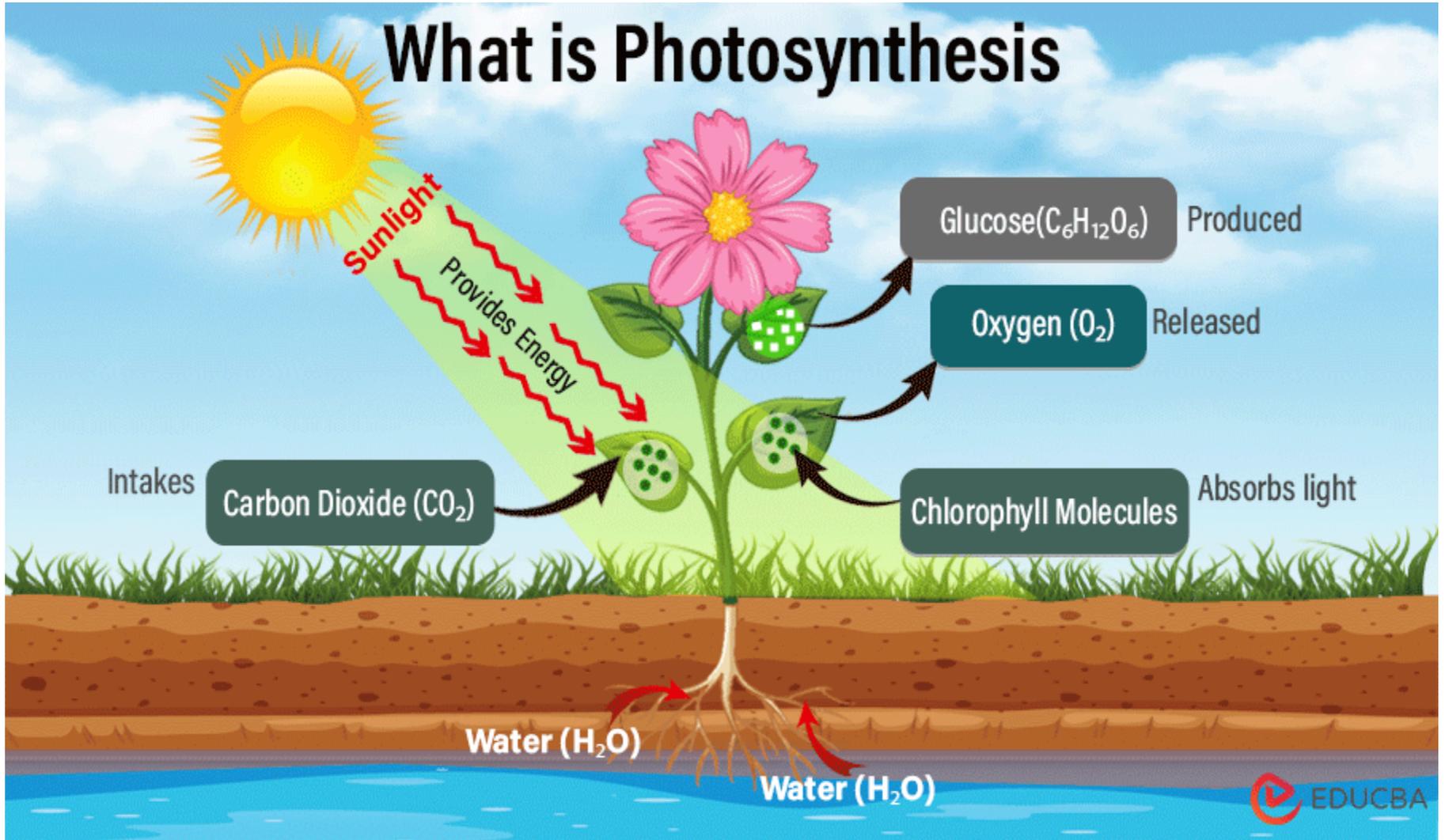
❖ **Equation:**



❖ **Chlorophyll Role:** Absorbs sunlight to drive the reaction.

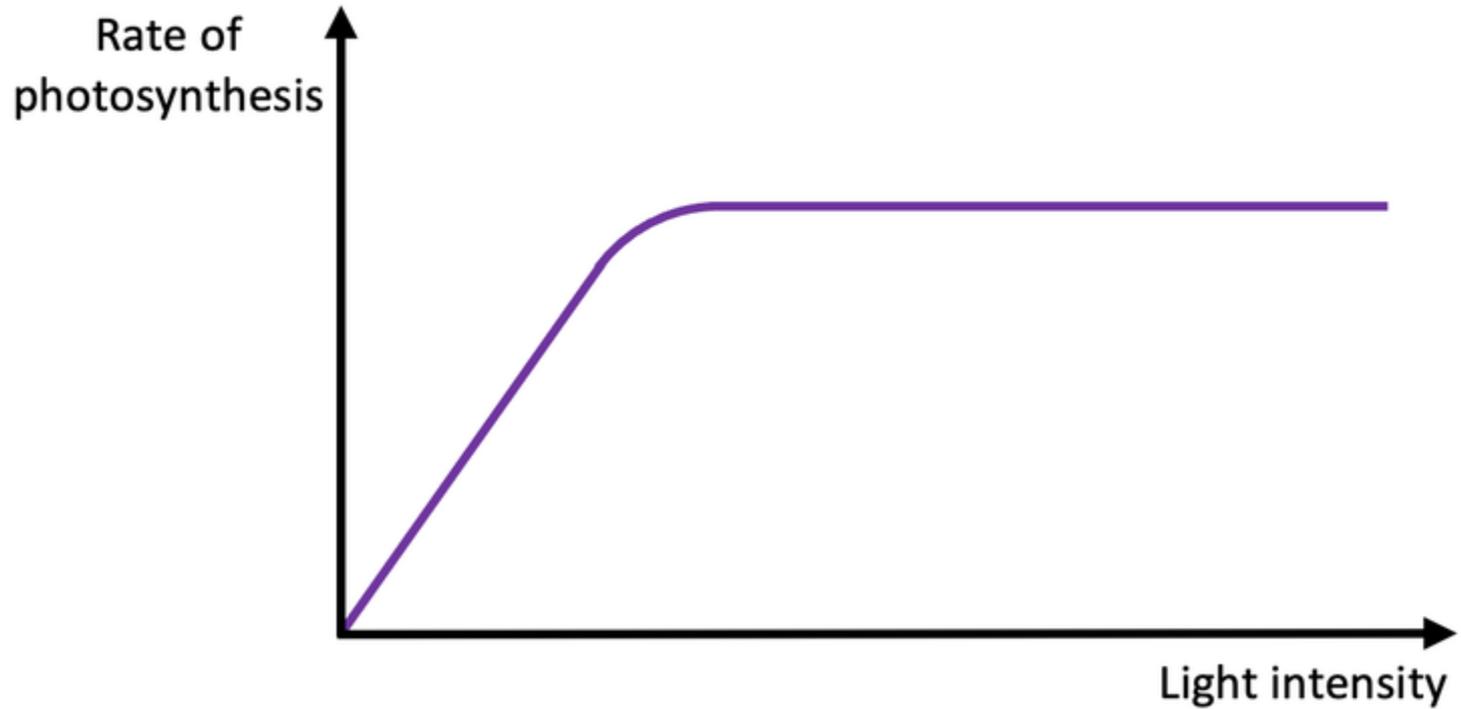
**More Sunlight → More Energy → More Growth**

# What is Photosynthesis





## Plant Environment Abiotic Factors:



**The relationship between photosynthesis and light intensity**



## Plant Environment Abiotic Factors:

### Properties of Sunlight

- **Light Spectrum:** Visible light (400–700 nm) is most important for photosynthesis.
- **Wavelengths:**
  - **Blue Light (400–500 nm):** Promotes vegetative growth.
  - **Red Light (600–700 nm):** Enhances flowering and fruiting.



## Plant Environment Abiotic Factors:

### Effects of Sunlight on Plant Growth

#### ❖ Positive Effects:

- Drives photosynthesis, producing energy for growth.
- Influences plant morphology (e.g., stem elongation, leaf expansion).
- Regulates flowering and fruiting through photoperiodism.

#### ❖ Negative Effects:

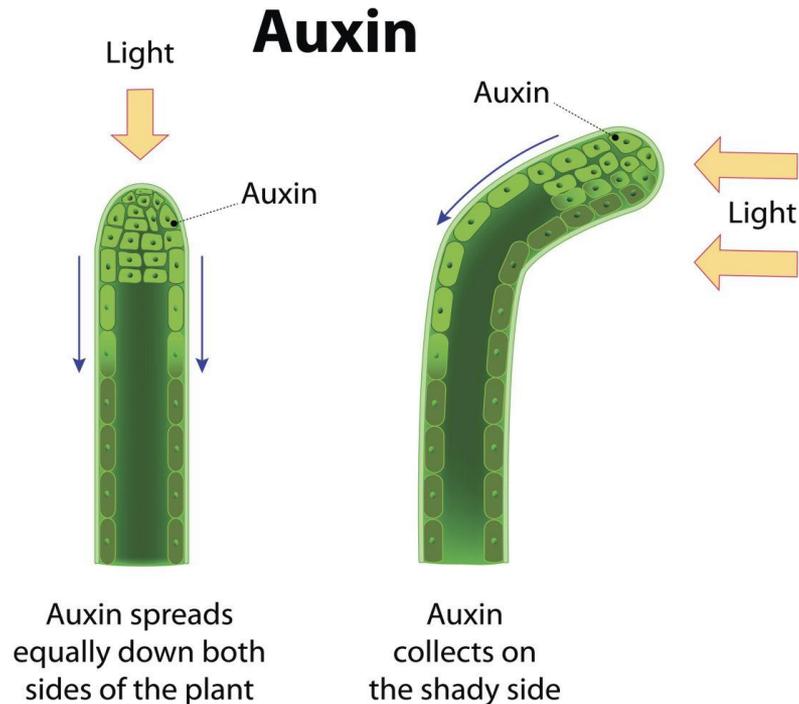
- Excessive light can cause photoinhibition and damage to chlorophyll.



## Plant Environment Abiotic Factors:

### Phototropism and Photoperiodism

- **Phototropism:** Growth movement of plants toward light (e.g., sunflowers tracking the sun).





## Plant Environment Abiotic Factors:

### Phototropism and Photoperiodism

- **Photoperiodism:** Response of plants to day length, influencing:
  - **Short-Day Plants:** Flower in short daylight (e.g., Rice and Corn).
  - **Long-Day Plants:** Flower in long daylight (e.g., spinach).
  - **Day-Neutral Plants:** Flower regardless of day length (e.g., tomatoes).



## Plant Environment

### Abiotic Factors:

## Adaptations to Sunlight

- **Sun Plants (Heliophytes):**
  - grows successfully in high light intensity.
  - Thick leaves, high chlorophyll content.
- **Shade Plants (Sciophytes):**
  - Adapted to low light conditions.
  - Thin leaves, larger surface area for light capture.

**Leaf Orientation:** Adjustable leaves to optimize light absorption.



## Plant Environment Abiotic Factors:

*Thanks for listening*