

**Light and Photosynthesis**

Lecture 10

---

---

---

---

---

---

---

---

---

---

---

---

**Learning Outcomes**

- Definition of Photosynthesis
- Equation for Photosynthesis
- Chloroplasts and Chlorophyll
- Different plants metabolisms

---

---

---

---

---

---

---

---

---

---

---

---

**Light**

10<sup>-5</sup> nm 10<sup>-3</sup> nm 1 nm 10<sup>3</sup> nm 10<sup>6</sup> nm 1 m 10<sup>3</sup> m

Gamma rays X-rays UV Infrared Micro-waves Radio waves

Visible light

380 400 500 600 700 750

Wavelength (nm)

600 nm

1 nm

Copyright © 2004 Pearson Education, Inc., publishing as Benjamin Cummings.

- Light travels as waves
- Wavelengths in nanometers (nm)
- Visible light between 380 and 750nm
- Energy 'packages' in light = PHOTONS

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

**Photosynthesis**

- Process by which plants use light energy to make food molecules from carbon dioxide (CO2) and water (H2O)
- Most important chemical process on earth
- Provides food supply for virtually all organisms on earth

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---





### Accessory Pigments



- Carotenoids
  - Xanthophylls
  - Carotenes
- Beta carotene
  - Converted to Vitamin A in body
- Absorb shortwave blue and violet light
- Reflects orange and yellow light

---

---

---

---

---

---

---

---

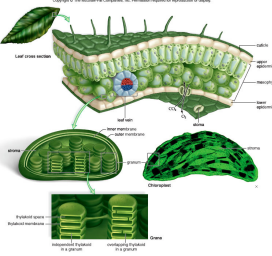
---

---

---

---

### Chloroplasts



- Double membrane bound organelle
- Site of photosynthesis
- Thylakoid membranes
  - Chlorophyll embedded in membranes
  - Light reactions
  - Organized in stacks or 'grana'
- Liquid stroma
  - Calvin cycle

---

---

---

---

---

---

---

---

---

---

---

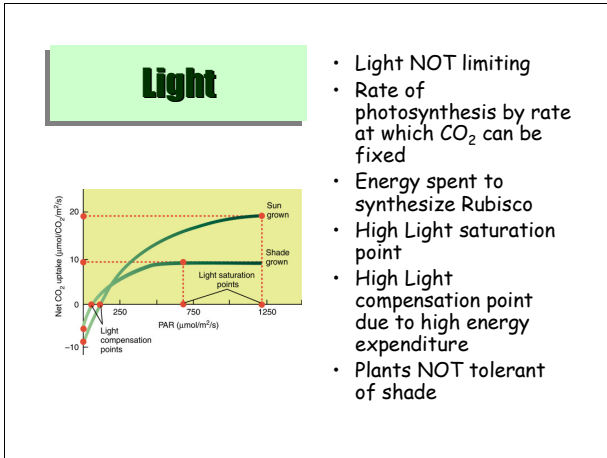
---












---



---



---



---



---



---



---



---



---



---



---