

CHAPTER 10

PHOTOSYNTHESIS

Learning objectives:

The Process that Feeds the Biosphere

1. Distinguish between autotrophic and heterotrophic nutrition.
2. Describe the structure of a chloroplast, listing all membranes and compartments.
3. Write a summary equation for photosynthesis.
4. In general terms, explain the role of redox reactions in photosynthesis.

The Pathways of Photosynthesis

5. Describe the two main stages of photosynthesis in general terms.
6. List the components of a photosystem and explain the function of each component.
7. Describe the similarities and differences in chemiosmosis between oxidative phosphorylation in mitochondria and photophosphorylation in chloroplasts.
8. Describe the role of ATP and NADPH in the Calvin cycle.
9. Describe carbon fixation
10. Describe the role of rubisco in sugar synthesis

Alternative Pathways to Photosynthesis

11. Describe photorespiration and the conditions under which it occurs
12. Describe C4 and CAM metabolism and the conditions under which it occurs