

## Photosynthesis Concept Questions

1. Explain why almost all organisms depend on photosynthesis to satisfy their energy needs.
2. Photosynthesis can be thought of as a process that converts energy. What are the three energy conversions?
3. What is the relationship between the processes of photosynthesis and cellular respiration?
4. Identify where each of the reactants in photosynthesis comes from and where the products are produced.
5. In the fall, what causes the leaves to become brightly colored?
6. Where *exactly* would you find chlorophyll and the ETC?
7. Summarize the events of the light reactions.
8. What molecule is analogous to the NADH used in cellular respiration?
9. What is the purpose of the electron transport chain in photosynthesis?
10. How do the electrons accepted by the ETC become high energy?
11. As electrons from the photosystems are used to reduce CO<sub>2</sub>, how is it that they never “run out”?
12. Why is the ATP produced in the chloroplasts not available to the plant cell for cell work?
13. Why does the primary electron acceptor have to be so close to the reaction center chlorophyll?
14. When plants photosynthesize, they always make more glucose than they require for energy. Explain.
15. Explain how the products of the light reaction are used to reduce CO<sub>2</sub> in the Calvin cycle to form PGAL and describe the fate of this PGAL.
16. What is the function of the Calvin cycle?
17. What is the immediate energy source for the Calvin cycle?
18. If you could catch all the G3P (PGAL) a green plant produces and remove it, what would happen to the plant?
19. If you illuminate a solution of chlorophyll, carbon dioxide, and water in a beaker, will the mixture produce sugar? Explain.
20. Both the light reactions and the Calvin Cycle stop when there is no light. Which specific reaction stops first? Which stops next? Continue answering the question “Which stops next?” until you have explained why both pathways have stopped.