

Name _____

AP Biology

TEXT: *Biology, Campbell and Reece*

7th Edition

Chapter 10

**Photosynthesis
Thematic Review Guide**

1. What role do autotrophs fill in the biosphere?

2. Indicate the role of each structure within the leaf:

a. stomates _____

b. mesophyll cells _____

c. thylakoid membranes _____

d. stroma _____

3. What is the source of oxygen released from photosynthesis?

4. In the overview of photosynthesis, indicate the most significant function of:

a. Light reaction _____

b. Calvin cycle _____

5. Light is a form of energy known as _____

and visible light has a wavelength range of _____.

6. Plant light receptors absorb _____ wavelengths

of light and reflect _____ wavelengths of light.

7. The porphyrin ring of chlorophyll contains the element _____

and the role of the ring is to _____

8. What does chlorophyll do when excited by photons? _____

9. How does cyclic differ from noncyclic photophosphorylation?

10. To generate ATP, chloroplasts rely on the ETC to _____

and ATP is synthesized when: _____

11. Within the thylakoid membrane and stroma, indicate what happens to each of the

following:

a. water _____

b. high energy electrons _____

c. H^+ _____

d. oxygen _____

e. $NADP^+$ _____

f. ADP _____

12. Where in the chloroplast is the H⁺ concentration highest? _____

13. What happens during carbon fixation? _____

14. List the materials the plant uses during the Calvin cycle and the source of the materials.

15. The products of the Calvin cycle are _____

16. What environmental and internal challenges have forced both C₄ and CAM plants to evolve alternatives to the photosynthesis system used by other plants?

17. Why do high oxygen levels inhibit photosynthesis? _____

18. What happens during photorespiration and why is it considered bad for plants?

19. What evolutionary adaptations to the Calvin cycle are seen in C4 plants like sugar cane?

20. Draw a diagram to show the anatomical adaptations seen in C4 plants to accommodate their variation on the Calvin cycle.

21. What evolutionary adaptation to the Calvin cycle is seen in CAM plants like cacti?
