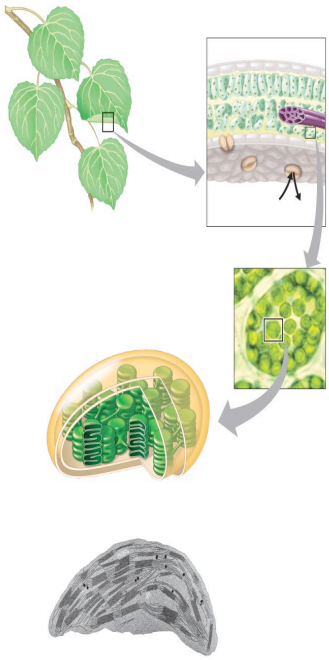
Name _____

AP Biology
Chapter 10 – Photosynthesis

Guided Reading Assignment Campbell's 10th Edition

Essential Knowledge:
2.A.1 All living systems require constant input of free energy
2.A.2 Organisms capture and store free energy for use in biological processes

LO 2.4 The student is able to use representations to pose scientific questions about what mechanisms and structural features allow organisms to capture, store and use free energy
LO 2.5 The student is able to construct explanations of the mechanisms and structural features of cells that allow organisms to capture, store or use free energy.
LO 2.41 The student is able to evaluate data to show the relationship between photosynthesis and respiration in the flow of free energy through a system.



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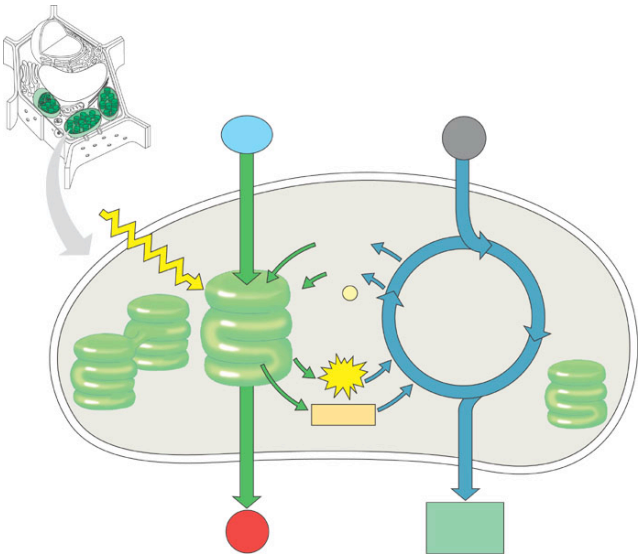
1. Label the diagram.

2. Explain the experiment reasoning that Van Niel used to understand photosynthesis.



3. Use the diagram to label and identify the two broad stages of photosynthesis.

4. What is carbon fixation?

5. What is a photon?

6. Why are leaves green?

7. Describe Engelmann's experiment and explain its results.

8. What is the difference between an absorption spectra and action spectrum?

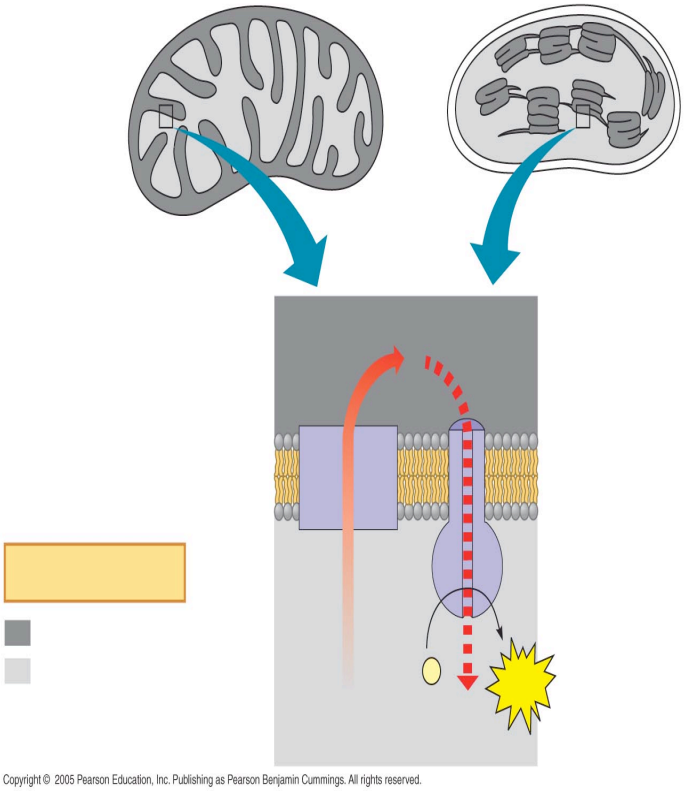
9. What happens to chlorophyll when it is hit by light? How does this relate to potential energy?

10. Identify the following parts of a photosystem:
    a. Photosystem
    b. Light harvesting complex
    c. Reaction center
    d. Primary electron acceptor

11. What are the steps in noncyclic electron flow in photosynthesis

12. What is cyclic electron flow?

13. Use the diagram to assist – but also write a response – compare and contrast chemiosmosis in mitochondria and chloroplasts.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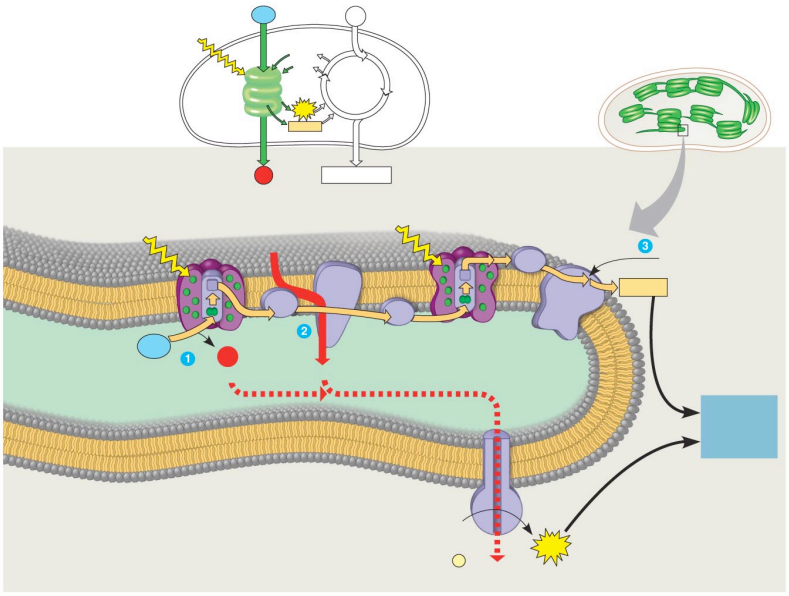

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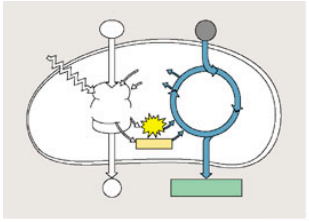
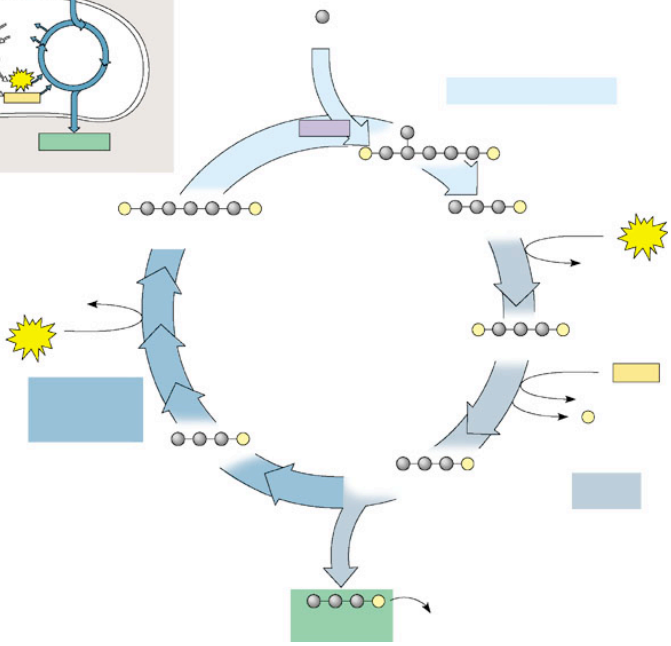
14. Use the diagram to summarize the activities in the light reactions of photosynthesis.

15. Describe and explain the overall purpose of the Calvin cycle and each phase listed below:
    a. Calvin cycle
    b. Carbon fixation
    c. Reduction
    d. Regeneration

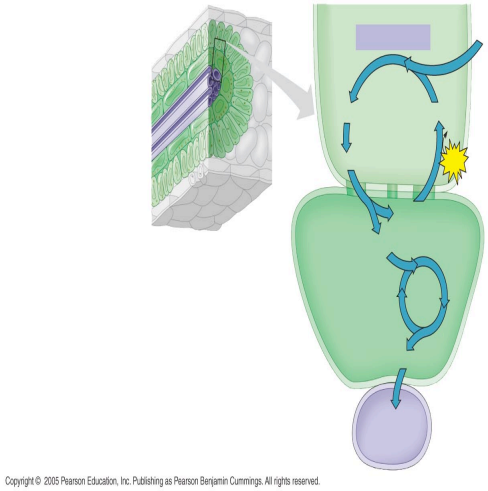




16. Label the diagram of the Calvin Cycle.

17. What is a plant's most valuable resource and why did plants need to evolve adaptations for hot, arid climates?

18. Why is photorespiration such a "waste"?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19. Use the diagram to explain C4 plants.

20. What are CAM plants and what is their "advantage"?

21. Use the diagram below to summarize the activities of photosynthesis.