



Photosynthesis

Capturing Light Energy

1. All organisms require _____ to carry out their life functions.
2. _____ is the ultimate energy for all life on earth
3. During photosynthesis, the energy from the sun is stored within _____
compounds, mainly the sugar _____.
4. What organisms can carry on photosynthesis?
5. Name several autotrophic organisms.
6. What is a biochemical pathway and give an example?
7. What gas is used by autotrophs & what gas is produced?
8. What organisms release stored energy from organic compounds through cellular respiration?
9. Draw the diagram showing energy storage & transfer between autotrophs & heterotrophs.
10. What are the light reactions of plants and in what organelle do they occur?
11. Draw & label the parts of a chloroplast. Tell the function of each labeled part.
12. Flattened sacs in chloroplasts are known as _____ and are _____ to each other
13. Thylakoid sacs in chloroplasts are called _____.
14. What gel-like solution surrounds the thylakoids inside the chloroplast?
15. What is the visible spectrum?
16. Name the 7 colors that make up the visible spectrum.
17. What 3 things can happen to light that strikes an object?
18. What are pigments & what is their function in plants?
19. Is red light reflected or absorbed by an object if the object appears red to your eyes?
20. Name the most important chloroplast pigment & tell the 2 most important types of this pigment.
21. Only _____ is directly involved in capturing light energy.

22. Chlorophyll b is an example of an _____ pigment in plants.
- 23 Name another accessory pigment & tell what colours it includes When could you see these colours?
24. Chlorophyll is most abundant in the _____ of a plant, while accessory pigments appear more in the _____ and fruits.
25. The _____ and _____ pigments are grouped into clusters in the thylakoid membrane.
26. What is a photosystem?
27. Name the 2 types of photosystems.
28. The light reactions start when _____ pigments absorb _____.
- 29 Absorbed light is passed to a pair of _____ pigment molecules in photosystem _____.
- 30 When light energy is absorbed by chlorophyll a molecules, what happens to its electrons?
31. Once these electrons become "excited", they have enough energy to do what?
32. What are the chemicals called that pick up these freed electrons & where are they located?
- 33 These electrons lose _____ as they are passed through a series of molecules called the _____ chain
34. Photosystem I chlorophyll molecules also absorb _____, and its electrons eventually combine with _____ to form NADPH.
- 35 What would happen if the electrons lost from photosystem II weren't replaced?
36. _____ provides the replacement electrons for photosystem II when water is _____
37. Write the equation for the splitting of a water molecule.
38. What important gas is released when water is split?
39. _____ or energy for a cell is synthesized during the light reactions in a process called _____.

Calvin Cycle

- 40 The _____ cycle is the second set of photosynthetic reactions that uses energy stored in _____ and _____ to make _____ compounds.
41. Carbon atoms from _____ are 'fixed' into organic compounds in the Calvin cycle in a process called carbon _____

42. In what part of the chloroplast does the Calvin cycle occur?
43. Carbon dioxide combines with _____ to make two molecules of _____
44. PGA is converted into _____, ADP, _____, and phosphate.
45. Carbohydrates made from PGAL in the Calvin cycle include the monosaccharides _____ and _____, the disaccharide _____, and polysaccharides such as _____, _____, and _____.
46. Write the balanced equation for photosynthesis.
47. Plants that fix carbon through the Calvin cycle are called what type of plants?
48. What are stomata & where are they located?
49. When would plant cells need to close or partially close their stomata?
50. Name 2 alternate carbon-fixing pathways used by plants in hot climates.
51. Plants that close their stomata during the hottest part of the day thus fixing carbon into four carbon compounds are called _____. Name three.
52. CAM plants open stomata at _____ and close during the _____.
53. Name 3 environmental factors that affect the rate of photosynthesis.