

Understanding Photosynthesis

Biology · Answer Key · 29 Questions

1. What is the primary process by which plants convert light energy into chemical energy?

- A) Respiration
- B) Transpiration
- C) Photosynthesis**
- D) Fermentation

2. Which gas do plants absorb from the atmosphere during photosynthesis?

- A) Oxygen
- B) Carbon Dioxide**
- C) Nitrogen
- D) Hydrogen

3. What is the main pigment responsible for capturing light energy in plants?

- A) Carotene
- B) Xanthophyll
- C) Chlorophyll**
- D) Anthocyanin

4. Which of the following is a product of photosynthesis?

- A) Water
- B) Carbon Dioxide
- C) Glucose**
- D) Nitrogen

5. What is the primary source of energy for photosynthesis?

- A) Heat from the soil
- B) Chemical bonds in water
- C) Light from the sun**
- D) Energy from nutrients

6. Where does photosynthesis primarily take place in a plant cell?

- A) Mitochondria
- B) Nucleus
- C) Ribosomes
- D) Chloroplasts**

7. What substance is released into the atmosphere as a byproduct of photosynthesis?

- A) Carbon Dioxide
- B) Glucose
- C) Oxygen**
- D) Water Vapor

8. What do plants use to transport water from their roots to their leaves for photosynthesis?

- A) Phloem
- B) Xylem**
- C) Stomata
- D) Cuticle

9. Besides light and carbon dioxide, what other key ingredient is needed for photosynthesis?

- A) Nitrogen
- B) Oxygen
- C) Water**
- D) Minerals

10. What is the chemical formula for glucose, a sugar produced during photosynthesis?

- A) CO₂
- B) H₂O
- C) C₆H₁₂O₆**
- D) O₂

11. Photosynthesis is essential for maintaining the balance of which two gases in the Earth's atmosphere?

- A) Nitrogen and Oxygen
- B) Carbon Dioxide and Methane
- C) Oxygen and Carbon Dioxide**
- D) Hydrogen and Helium

12. What part of the plant leaf is primarily responsible for gas exchange (taking in CO₂ and releasing O₂)?

- A) Epidermis
- B) Veins
- C) Stomata**
- D) Mesophyll

13. In which part of the chloroplast does the light-dependent reaction of photosynthesis occur?

- A) Stroma
- B) Thylakoids**
- C) Outer Membrane
- D) Inner Membrane

14. In which part of the chloroplast does the light-independent reaction (Calvin Cycle) of photosynthesis occur?

- A) Thylakoids
- B) Stroma**
- C) Granum
- D) Outer Membrane

15. What is the main function of stomata in photosynthesis?

- A) Absorbing sunlight
- B) Releasing oxygen
- C) Regulating water loss and gas exchange**
- D) Producing glucose

16. What are the two main stages of photosynthesis?

- A) Glycolysis and Krebs Cycle
- B) Light-dependent reactions and Light-independent reactions**
- C) Fermentation and Aerobic Respiration
- D) Cellular Respiration and Photosynthesis

17. What is the energy currency molecule produced during the light-dependent reactions that powers the Calvin cycle?

- A) ATP**
- B) ADP
- C) NADPH
- D) NADP+

18. Besides ATP, what other energy-carrying molecule is produced during the light-dependent reactions and used in the Calvin cycle?

- A) Glucose
- B) Water
- C) NADPH**
- D) Oxygen

19. The Calvin Cycle uses ATP and NADPH to convert carbon dioxide into what?

- A) Oxygen
- B) Water
- C) Glucose**
- D) Light Energy

20. What is the overall equation for photosynthesis?

- A) $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$
- B) $6CO_2 + 6H_2O + \text{Light Energy} \rightarrow C_6H_{12}O_6 + 6O_2$**
- C) $6CO_2 + C_6H_{12}O_6 \rightarrow 6O_2 + 6H_2O$
- D) $C_6H_{12}O_6 \rightarrow 6CO_2 + 6H_2O$

21. What is the role of chlorophyll in photosynthesis?

- A) To store water
- B) To break down glucose
- C) To absorb light energy**
- D) To release oxygen

22. What would happen to a plant if it were deprived of sunlight for an extended period?

- A) It would grow faster
- B) It would produce more oxygen
- C) It would eventually die due to lack of energy production**
- D) It would start to respire more intensely

23. Photosynthesis is a process that converts light energy into what type of energy?

- A) Thermal energy
- B) Mechanical energy
- C) Chemical energy**
- D) Electrical energy

24. What is the term for organisms that can produce their own food through photosynthesis?

- A) Heterotrophs
- B) Consumers
- C) Autotrophs**
- D) Decomposers

25. What are the raw materials for photosynthesis?

- A) Glucose and Oxygen
- B) Carbon Dioxide and Water**
- C) Water and Glucose
- D) Oxygen and Carbon Dioxide

26. What are the products of photosynthesis?

- A) Carbon Dioxide and Water
- B) Glucose and Oxygen**
- C) Water and Glucose
- D) Oxygen and Carbon Dioxide

27. Which of the following is NOT a direct input for photosynthesis?

- A) Carbon Dioxide
- B) Water
- C) Sunlight
- D) Oxygen**

28. Which of the following is NOT a direct output of photosynthesis?

- A) Glucose
- B) Oxygen
- C) Carbon Dioxide**
- D) Water (as a product, though also an input)

29. What is the primary purpose of photosynthesis for the plant?

- A) To produce water
- B) To release carbon dioxide
- C) To create food (glucose) for energy and growth**
- D) To absorb oxygen