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Photosynthesis and cellular respiration test study guide

1. Cellular respiration uses energy from food to produce ATP. 2. Heterotrophs are organisms that cannot produce their own food and need to consume other organisms or plants for energy. 3. The ultimate energy source for all life on earth is the sun's energy, which is converted into chemical bonds in organic molecules. 4. Photosynthesis is a process by which plants convert light energy from the sun into chemical energy stored in glucose. 5. Grana are found in the thylakoid membranes of chloroplasts and contain pigments that absorb light energy. 6. A biochemical pathway is a series of chemical reactions that occur within cells to perform specific functions, such as energy production or DNA replication. 7. Solar energy is converted into ATP during photosynthesis. 8. Chlorophyll's function is to absorb light energy from the sun and transfer it to other molecules, which are then used to power photosynthesis. 9. Light can be affected in three ways when it strikes an object: absorption, reflection, or transmission. 10. Chlorophyll appears green because it absorbs light in the blue and red parts of the visible spectrum but reflects light in the green part. 11. When a chlorophyll molecule absorbs light energy, the electrons become energized and are transferred to other molecules. 12. The energized electrons are used to generate ATP during the light reactions of photosynthesis. 13. The source of oxygen produced during photosynthesis is water, which is split into oxygen and hydrogen ions using energy from light. 14. The products of the light reactions that provide energy for the Calvin cycle are ATP and NADPH. 15. The Calvin cycle can occur in the presence or absence of light, but light is required to generate ATP and NADPH. 16. Carbon dioxide is a byproduct of photosynthesis. 17. Glucose is produced during the light-dependent reactions of photosynthesis. 18. The two energy sources for the Calvin cycle are ATP and NADPH. 19. The carbon in organic molecules comes from inorganic compounds such as carbon dioxide, which is fixed into organic molecules through photosynthesis. 20. Heterotrophs depend indirectly on autotrophs for energy by consuming their products. 21. Energy is temporarily stored in ATP during cellular respiration. 22. All organisms use glucose as their primary energy molecule. 23. Oxygen produced during photosynthesis is used during cellular respiration to produce ATP. 24. Lactic acid can cause muscle fatigue by increasing the concentration of hydrogen ions, which disrupts muscle function. 25. Muscles form lactic acid during anaerobic respiration when oxygen is limited. 26. Glucose is split into pyruvate and carbon dioxide during glycolysis. 27. Two molecules of ATP are produced from the splitting of glucose in the cytoplasm. 28. 2-3 ATP molecules are made from the initial splitting of glucose in the cytoplasm. 29. Anaerobic respiration of carbohydrates is called fermentation. 30. The two main stages in cellular respiration are glycolysis and oxidative phosphorylation. 31. Aerobic respiration only occurs in the presence of oxygen. 32. NADPH is formed during the light reactions of photosynthesis. 33. NADH is formed during glycolysis. 34. The Krebs cycle occurs in the mitochondria during cellular respiration. 35. The Calvin cycle occurs in the stroma of chloroplasts during photosynthesis. 36. Water is the end product of the electron transport chain (ETC) during oxidative phosphorylation. 37. At the end of the ETC, oxygen gas is added to form water. 38. The most ATP is generated during the oxidative phosphorylation stage of cellular respiration. 39. Two energy carriers that enter the ETC in cellular respiration are NADH and FADH₂.

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