- 1. As a review, define the terms outotroph and heterotroph. Keep in mind that plants have mitochondria and chloroplasts and do both cellular respiration and photosynthesis! Autotrophs are able to sustain themselves without eating other living organisms or material derived from living organisms. Autotrophs make their own "food" through either photosynthesis (solar energy -glucose) or chemosynthesis (inorganic materials such as methane and hydrogen sulfide -> organic molecules). Autotrophs are also known as producers. Heterotrophs must consume other organisms for energy. Decomposers (some bacteria and fungi) are considered heterotrophs.
- Draw a picture of a chloroplast and label the stroma, thylakoid, thylakoid space, inner membrane, and outer membrane.



- 3. Use both chemical symbols and words to write out the formula for photosynthesis. 6CO₂ + 6H₂O + Light Energy → C₀H₂₂O₀ + 6O₂. Carbon dioxide reacts with water and energy from the sun to produce glucose and oxygen. Photosynthesis is another example of a redox reaction where carbon dioxide is reduced to glucose and water is oxidized to oxygen. The electrons increase in potential energy as they move from water to sugar (endergonic). The energy is provided by the sun.
- 4. Photosynthesis is not a single process, but two processes, each with multiple steps.
 - a. Explain what occurs in the light reactions stage of photosynthesis. Be sure to use NADP+ and photophosphorylation in your discussion. The light reactions occur in the thylakoid membranes of the chloroplasts. During the light reactions, water is split which provides a source of electrons and H' ions (protons). When water is split, oxygen gas is released as a byproduct, Light absorption by chlorophylli transfer electrons and H' to an electron carrier called NADP+. The light reactions also generate ATP, using chemiosmosis to power the addition of a phosphate to ADP. This is called photophosphorylation. At the end of the light reactions, light energy is converted into chemical energy store in ATP and NADPH. (No sugar yet!)
 - b. Explain the Colvin cycle, utilizing the term carbon fixation in your discussion. The Calvin cycle occurs in the stroma of the chloroplasts. The Calvin cycle begins with the incorporation of carbon dioxide from the air into organic molecules already present in the chloroplast. This is known as carbon fixation. The Calvin cycle then reduces the fixed carbon into carbohydrates by adding electrons provided NADPH. Chemical energy is supplied by ATP. The end result of the Calvin cycle is carbohydrate molecules called G3P which consist of 3 carbons each. G3P molecules are used to produce glucose.

Guide Photosynthesis Answers

Raffaela Di Napoli

Guide Photosynthesis Answers:

Decoding Guide Photosynthesis Answers: Revealing the Captivating Potential of Verbal Expression

In an era characterized by interconnectedness and an insatiable thirst for knowledge, the captivating potential of verbal expression has emerged as a formidable force. Its ability to evoke sentiments, stimulate introspection, and incite profound transformations is genuinely awe-inspiring. Within the pages of "**Guide Photosynthesis Answers**," a mesmerizing literary creation penned by a celebrated wordsmith, readers attempt an enlightening odyssey, unraveling the intricate significance of language and its enduring impact on our lives. In this appraisal, we shall explore the book is central themes, evaluate its distinctive writing style, and gauge its pervasive influence on the hearts and minds of its readership.

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Table of Contents Guide Photosynthesis Answers

- 1. Understanding the eBook Guide Photosynthesis Answers
 - The Rise of Digital Reading Guide Photosynthesis Answers
 - Advantages of eBooks Over Traditional Books
- 2. Identifying Guide Photosynthesis Answers
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
- 3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Guide Photosynthesis Answers
 - User-Friendly Interface
- 4. Exploring eBook Recommendations from Guide Photosynthesis Answers
 - Personalized Recommendations
 - Guide Photosynthesis Answers User Reviews and Ratings
 - Guide Photosynthesis Answers and Bestseller Lists

- 5. Accessing Guide Photosynthesis Answers Free and Paid eBooks
 - Guide Photosynthesis Answers Public Domain eBooks
 - Guide Photosynthesis Answers eBook Subscription Services
 - Guide Photosynthesis Answers Budget-Friendly Options
- 6. Navigating Guide Photosynthesis Answers eBook Formats
 - ∘ ePub, PDF, MOBI, and More
 - Guide Photosynthesis Answers Compatibility with Devices
 - Guide Photosynthesis Answers Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Guide Photosynthesis Answers
 - Highlighting and Note-Taking Guide Photosynthesis Answers
 - Interactive Elements Guide Photosynthesis Answers
- 8. Staying Engaged with Guide Photosynthesis Answers
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - $\circ\,$ Following Authors and Publishers Guide Photosynthesis Answers
- 9. Balancing eBooks and Physical Books Guide Photosynthesis Answers
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Guide Photosynthesis Answers
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Guide Photosynthesis Answers
 - Setting Reading Goals Guide Photosynthesis Answers
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Guide Photosynthesis Answers
 - Fact-Checking eBook Content of Guide Photosynthesis Answers
 - Distinguishing Credible Sources
- 13. Promoting Lifelong Learning

- Utilizing eBooks for Skill Development
- Exploring Educational eBooks
- 14. Embracing eBook Trends
 - Integration of Multimedia Elements
 - Interactive and Gamified eBooks

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