

## CAPTURING ENERGY (PHOTOSYNTHESIS)

1. What is the ultimate source of energy that powers cells?  
Sunlight
2. What are the three main things required for photosynthesis?  
Sunlight,  $\text{CO}_2$ , water
3. For what are enzymes needed in photosynthesis?  
speed up chemical reactions
4. What are the two raw materials of photosynthesis and where do they come from?  
 $\text{CO}_2$  - air ; water - ground (from roots)
5. What is the end product of photosynthesis?  
glucose
6. What are the two byproducts of photosynthesis?  
 $\text{O}_2$  & water
7. Write the basic equation for photosynthesis:  
$$\text{CO}_2 + \text{H}_2\text{O} \xrightarrow{\text{light}} \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2 + \text{H}_2\text{O}$$
8. What does light provide for photosynthesis?  
energy to split water
9. What portions of the visible spectrum provide the most energy for photosynthesis?  
red, blue, & violet
10. What is chlorophyll and what role does it play in photosynthesis?  
pigment that traps light
11. What are xanthophylls and carotenes, and what role do they play in photosynthesis?  
other pigments that trap light
12. What role does carbon dioxide play in photosynthesis?  
Enters dark reactions to make glucose
13. What role does water play in photosynthesis?  
Water enters light reactions, gives off  $\text{O}_2$  & sends hydrogen & ATP to dark reactions
14. From what type of molecules does the oxygen released into the air come?  
Water
15. What is the first phase of photosynthesis, and why is it so named?  
"Light reactions" because it needs light
16. Summarize what happens in the light reactions.  
Water is split into hydrogen/oxygen (by light) & sends hydrogen/ATP to dark reactions & makes oxygen

Answer the questions pertaining to each of the equations below:



a.) Name the process represented by this equation. photosynthesis

b.) Name the substance represented by these chemical formulas:

$\text{CO}_2$  carbon dioxide       $\text{O}_2$  oxygen

$\text{H}_2\text{O}$  water       $\text{C}_6\text{H}_{12}\text{O}_6$  glucose

c.) Where does the oxygen gas come from? water

d.) Where in a cell does this process take place? chloroplasts

e.) What is the catalyst for this reaction? sunlight

f.) Name <sup>two</sup> ~~these~~ organisms that undergo this process. plants & algae

g.) What usually serves as the source of light energy? sunlight

h.) What is the light energy used for? to split water molecule



a.) Name the process represented by this equation. aerobic cellular respiration

b.) Name the substances represented by these chemical formulas:

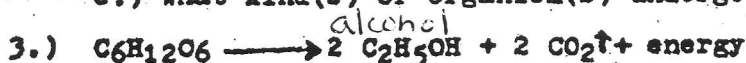
$\text{C}_6\text{H}_{12}\text{O}_6$  glucose       $\text{CO}_2$  carbon dioxide

$\text{O}_2$  oxygen       $\text{H}_2\text{O}$  water

c.) How much energy is released by this process? 36

d.) In what cell organelle does this process take place? mitochondria

e.) What kind(s) of organism(s) undergo this process? plants, animals, & fungus



a.) Name the process represented by this equation. alcoholic fermentation

b.) Name the substances represented by these chemical formulas:

$\text{C}_6\text{H}_{12}\text{O}_6$  glucose       $\text{C}_2\text{H}_5\text{OH}$  alcohol       $\text{CO}_2$  carbon dioxide

c.) How much energy is released by this process? 0

d.) What kind of organisms undergo this process? yeast



a.) Name the process represented by this equation. glycolysis

b.) Name the substances represented by these chemical formulas:

$\text{C}_6\text{H}_{12}\text{O}_6$  glucose       $\text{C}_3\text{H}_6\text{O}_3$  pyruvic acid

c.) How much energy is released in this process? 2 ATP

d.) What kind of cells undergo this process? everything

(all living things)