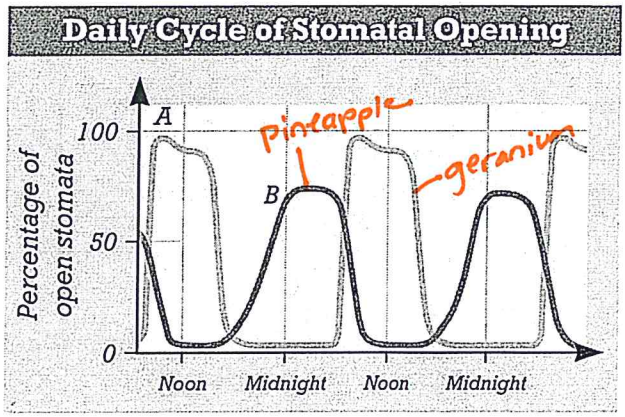
Energy for Life Study Guide Name Answer Key Date_____Per___

Answer the questions below. Use complete sentences!

1. Distinguish between autotrophs and heterotrophs.
Auto trophs make their own food but heterotrophs eat other things for food.
2. Identify the primary source of energy for humans.
Humans consume food, and glucose is a primary source (carbohydrates)
3. Relate the types of pigments involved in photosynthesis and their roles.
Chlorophyll is a green pigment which captures red and blue light but reflects green. Carotenoids absorb greens and some yellows and can appear yellow, orange, red or brown.
4. Explain how oxygen is generated in photosynthesis.
During the light reaction water is split to make electrons, hydrogen ions and oxygen. After two waters are spait, O_2 is made and it diffuses out of the cell.
5. The graph to the right shows how the percentage of stomata that are open varies over time for two different plants. One curve represents the stomata of a geranium, and the other curve represents the stomata of a pineapple. Which curve corresponds to the pineapple stomata? Explain your reasoning.
CAM plant → pineapple
CAM open stomata at night and close in the day



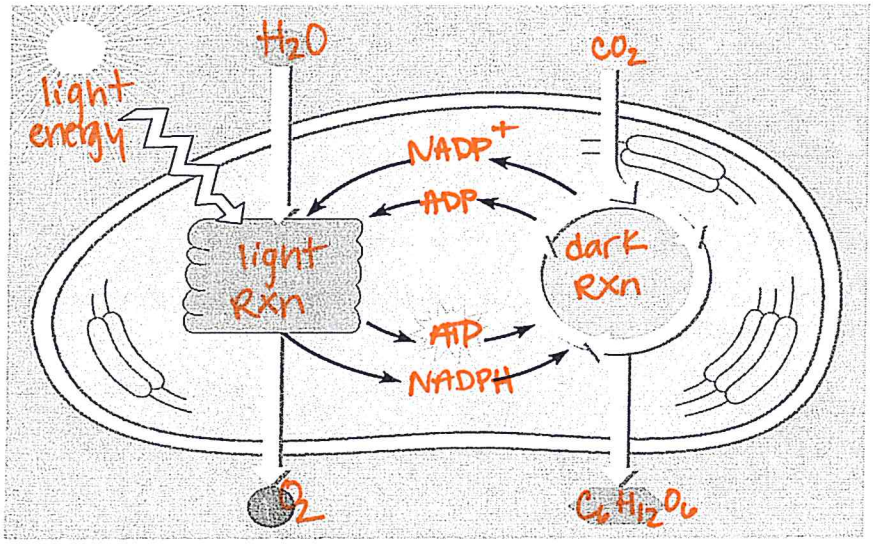
6. In which phases of photosynthesis (light or dark reactions) are carbon dioxide and water used, and oxygen and glucose produced?
water is used and oxygen is produced in the light reaction. Carbon dioxide is used and glucose is produced in the dark reaction.
7. What is the equation for photosynthesis and how does it relate to the equation for respiration?
$6H_2O + 6CO_2 \rightarrow C_6H_{12}O_6 + 6O_2$
The equations for photosynthesis and respiration are opposites of each other.
8. What are the different types of carbohydrates and what are their functions?
monosaccharides like glucose and fructose are used as building blocks or energy. Disaccharides like sucrose are used for energy. Polysaccharides like starch and glycogen are used for energy but cellulose and chitin are used for structure.
9. How can you tell glucose and fructose apart?
Glucose is a six sided shape (hexagon) and fructose is five sided (pentagon)
10. What is the difference between aerobic and anaerobic?
Aerobic means "with oxygen" and anaerobic means "without oxygen"
11. Describe the difference between lactic acid fermentation and alcoholic fermentation. Which one is done in our muscles?
Both lactic acid fermentation and alcoholic fermentation convert pyruvic acid into something else. lactic acid ferm. turns it into lactic acid which builds up in our muscles. Alcoholic fermentation turns pyruvic acid into CO_2 and alcohol.
12. Describe glycolysis and what it makes.
Glycolysis turns $C_6H_{12}O_6$ (glucose) into two pyruvic acids and it makes 2ATP and NADH in the process.

13. Describe the Kreb's cycle and electron transport chain/chemiosmosis.
During the Krebs cycle CO_2 is released, NADH is made and 2 total ATP are made. During the ETC, NADH drops off H^+ and e^- and ATP (34 of them) are made with ATP synthase. The H^+ and e^- land on O_2 and make H_2O.

14. How many ATP are made in each of these steps: glycolysis, Kreb's cycle, ETC?
Glycolysis makes 2 ATP, Krebs cycle makes 2 ATP and the ETC makes 34 ATP

15. What is the purpose of cellular respiration?
The purpose of cellular respiration is to make ATP from glucose.

16. Fill in the diagram of photosynthesis below:



17. Fill in the cellular respiration diagram below: