

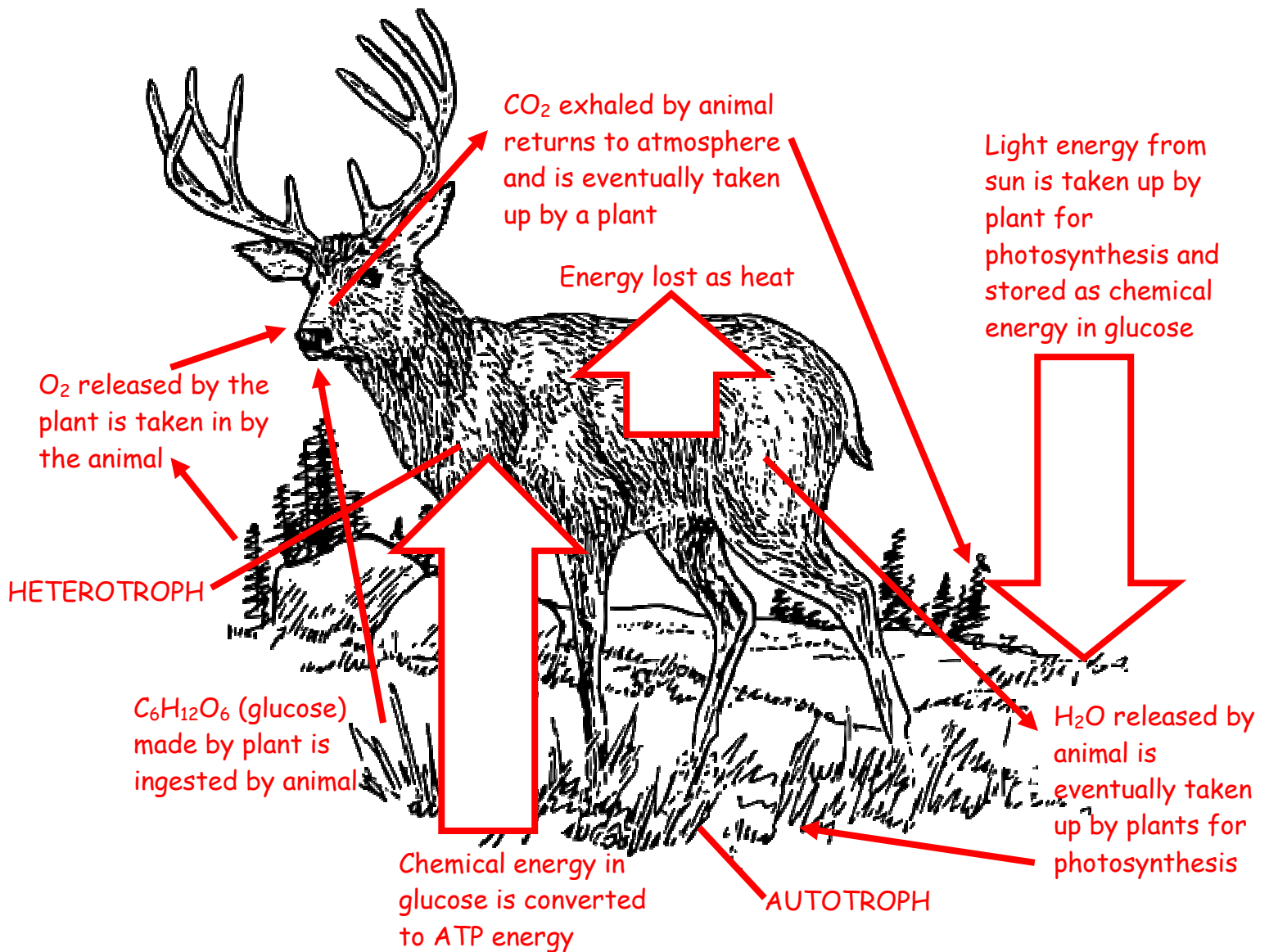
Name: _____

Period: _____

Date: _____

Topic 2: Cellular Respiration

1. Name and briefly describe each of the three stages of cellular respiration.
glycolysis: glucose broken down, generates 2 ATP, does not require O_2
Krebs Cycle: cycling of carbon compounds, requires O_2 (necessary for ETC)
Electron Transport Chain (ETC): series of reaction on the inner membrane that generates 32 ATP, requires O_2
2. Explain how ATP stores potential energy.
When a phosphate group is removed from ATP, it releases energy that the cell can use
3. What is the difference between ATP and ADP?
ATP has three phosphate groups, ADP only has two
4. Explain how respiration (breathing) is related to cellular respiration.
We must breathe in oxygen because it is necessary for aerobic cellular respiration to take place. Otherwise, we would have to use anaerobic respiration, which would not produce enough ATP to support our energy needs.
5. Write the overall reaction for cellular respiration.
 $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + ATP$ (energy)
6. What is an electron transport chain?
series of membrane proteins that transfer electrons and generate ATP
7. Where in the cell do the glycolysis reactions take place?
cytoplasm
8. Why is it more beneficial for an organism to use aerobic cellular respiration than anaerobic?
aerobic respiration can produce many more molecules of ATP from a single molecule of glucose
9. Would it be possible for a fish to survive in a plastic bag filled with water and an Elodea plant, then sealed so that it is airtight? Explain your answer.
Theoretically, yes. The products of photosynthesis (oxygen and glucose) could be used for cellular respiration in the fish and the products of respiration (CO_2 and H_2O) can be used for photosynthesis in the plant.
10. Which of the following organisms are capable of performing cellular respiration? Choose all that apply.
turtle oak tree algae fungus bacteria humans snail
Remember that ALL organisms use cellular respiration.



11. Draw arrows and *write a description* of the movement of each of the following compounds in the image above: C₆H₁₂O₆, CO₂, O₂, H₂O (description = how does it get there, what is it used for, etc.)
12. Add arrows to depict the flow of *energy* through this diagram (light, heat, ATP, etc.).
13. Label the organisms in the diagram as either autotrophs or heterotrophs.
14. The element we are working on says “explain the cycling of energy through the processes of photosynthesis and respiration.” In the space below, do this. ☺

The products of photosynthesis are the starting materials for cellular respiration. Plants convert light energy to chemical energy through the process of photosynthesis and then the glucose is broken down (by both plants AND animals) by cellular respiration in order to release energy in the form of ATP. Energy is returned to the environment in the form of heat.