Cellular Respiration Review

1. What are the 3 phases of the cellular respiration process?
   **Glycolysis, Oxidative Respiration (Krebs Cycle, Electron transport)**
2. Where in the cell does the glycolysis part of cellular respiration occur? **In the cytoplasm**
3. Where in the cell does the oxidative respiration part of cellular respiration occur? **In the mitochondria**
4. How many ATP (net) are made in the glycolysis part of cellular respiration? **2**
5. How many ATP are made in the oxidative respiration part of cellular respiration? **34**
6. In which phase of cellular respiration is glucose a substrate? **Glycolysis**
7. What would happen to the cellular respiration process if the enzyme for one step of the process were missing or defective? **The process beyond that stage could not occur**
8. What is the overall reaction for fermentation in yeast?
   **Glucose \(\rightarrow\) 2 Ethyl alcohol + 2 CO\(_2\) + 2 ATP + Heat**
9. What is the overall reaction for lactic acid fermentation?
   **Glucose \(\rightarrow\) 2 Lactic Acid + 2 ATP + Heat**
10. Only a small part of the energy released from the glucose molecule during glycolysis is stored in ATP. How is the rest of the energy released? (HINT: It is a product in the overall reaction for cellular respiration.) **The energy is released as heat.**
11. Write the complete overall chemical equation for cellular respiration using chemical symbols instead of words:
    \[ C_6H_{12}O_6 + 6 O_2 \rightarrow 6 H_2O + 6 CO_2 + ATP + HEAT \]
12. Compare this reaction to the one used for PHOTOSYNTHESIS:
    \( (6 \text{ H}_2\text{O} + 6 \text{ CO}_2 + \text{ light energy} \rightarrow C_6\text{H}_{12}\text{O}_6 + 6 \text{ O}_2) \) How are these equations related?
    **The products of photosynthesis are the reactants for cellular respiration and the inverse for the reactants in photosynthesis.**
13. **Glycolysis** is the process of splitting a glucose molecule into 2 pyruvic acid molecules.
14. The molecule used by cells to store and transfer energy is **ATP**
15. Glycolysis happens outside the mitochondria in the **cytoplasm** of the cell.
16. **Cellular respiration** happens when oxygen is present and includes glycolysis, Krebs cycle, and Electron transport.
17. This describes a process that requires oxygen = **aerobic**
18. This atmospheric gas is required for aerobic respiration = **oxygen**
19. This describes a process that does NOT require oxygen; it means “without air”
   = **anaerobic**
20. Type of fermentation used by human muscles in low oxygen conditions and microorganisms to make yogurt, cheese, pickles, sauerkraut and kimchi. = **lactic acid**
21. This 3 carbon molecule is produced during glycolysis when glucose splits in half
22. = **pyruvic acid**
23. Cell organelle which acts as the cell’s power plant to burn glucose and store energy as ATP
   = **mitochondria**
24. If oxygen is NOT present, glycolysis is followed by **fermentation.**
25. This molecule has the formula \( C_6H_{12}O_6 \) and is split in half during glycolysis
   = **glucose**
26. **Glycogen** is the storage form of glucose used by animal cells which can be broken down for energy when glucose is used up.