

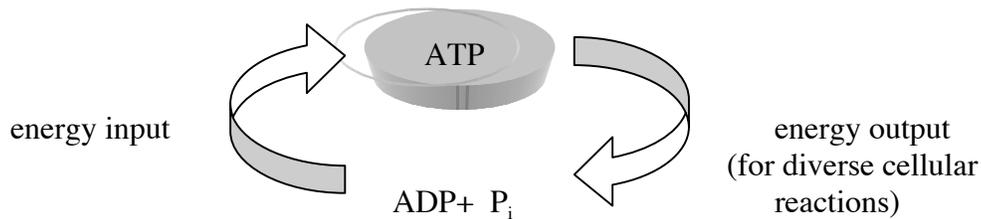
GR. 12 UNIVERSITY PREP. BIOLOGY REVIEW

Unit 2 – Metabolic Processes

Chapter 2 - Cellular Respiration

1. Summarize the overall cellular respiration reaction
(i.e. $C_6H_{12}O_6 + 6O_2 \longrightarrow CO_2 + 6H_2O + \text{energy}$)

2. Describe the importance of ATP to cellular metabolism.



3. Respiration can be divided into 3 distinct steps. For each step, state the reactants, products and location of reaction.
4. Describe the anatomy of a mitochondrion
5. Trace the synthesis of ATP, NADH and FADH₂ during glycolysis and the Krebs' Cycle.
6. Describe the method by which NADH and FADH₂ are converted into ATP in the electron transport chain.
7. What is the total yield of ATP for each glucose molecule used in aerobic respiration? How does this total compare with that from anaerobic respiration?
8. Describe the selective advantage that eukaryotes experience due to the fact that they possess mitochondria?
9. Describe the related pathways that allow ATP to be generated from proteins, lipids nucleic acids and carbohydrates other than glucose
10. Describe anaerobic pathways (ie. lactate fermentation and alcohol fermentation). What is the function of lactate fermentation in eukaryotic cells.

Chapter 3 - Photosynthesis

1. Describe photosynthesis in a single, balance chemical equation.
2. On a graph, show the relative absorption spectra for chlorophyll a and b.
3. Explain how the other photosynthetic pigments act in conjunction with chlorophyll a and b, to obtain energy from the sun. Describe the action of Photosystem I and II in relation to the light dependent reaction.
4. Describe how the products of the light dependent reaction contribute to the light-independent reaction.
5. Illustrate the internal structure of a chloroplast and indicate the distinct regions in which **the light-dependent** and **the light-independent reactions** occur.
6. How does photosynthesis lead to the production of Oxygen gas?
7. How many CO₂ molecules must enter the Calvin-Benson cycle to produce one sugar phosphate?
8. Explain why a solution containing isolated chlorophyll molecules fluoresces when exposed to bright white light.
9. Compare and contrast photosynthesis and cellular respiration. Describe how specific enzymes, the membrane bound organelles and the increase of membrane surface area facilitates both processes.

