Metabolism Worksheet: Energy, Enzymes and Metabolism

- What is energy?
- What are the forms of energy?
- What are the 2 laws of thermodynamics useful in a discussion of biology?
- What is entropy and how does it relate to chemical reactions?
- What is metabolism?
- What is free energy?
- What is meant by endergonic and exogonic? Which cellular processes do each?
- How is energy stored in a biological system? Released?
- What is an enzyme?
- What is meant by the energy of activation and how does an enzyme function in that respect?
- How does an enzyme work?
- How can you regulate an enzyme?
- What are the factors affecting enzyme activity?
- In regards to the three domains of cells, what structures are required for ATP production?
- There are 6 major processes relating to ATP-generation. What are they and where do they occur?
- What is meant by redox and what molecules are involved in a redox reaction?
- What is the role of oxygen in respiration and which processes require oxygen?
- What is glycolysis? Where does it occur? Is oxygen present, absent or either?
    - What are the steps of glycolysis?
    - What is the punch line or final equation to glycolysis?
- What is fermentation? Where does it occur? Is oxygen present, absent or either?
    - What are the steps of fermentation?
    - What is the punch line or final equation to fermentation?
- What is the "prep" reaction? Where does it occur (and what type of cell does it occur in?). Is oxygen present, absent or either?
    - What are the steps of the "prep" reaction?
    - What is the punch line or final equation to the "prep" reaction?
- What is the citric acid cycle? Where does it occur? Type of cell? Is oxygen present, absent or either?
    - What are the steps to the citric acid cycle?
    - What is the punch line or final equation to the citric acid cycle?
- What happened to all the ATP that is supposedly produced by this multistep process?
- What happened to the molecule glucose that originated this multistep process?
- What products were produced as ATP production was occurring?
- What is the electron transport chain? Where does it occur in the cell? Cell type? Is oxygen present, absent or either? What type of oxygen, if any, is required?
    - What are the steps of the electron transport chain?
    - What happens as a result of the action of the various coenzymes bouncing electrons around?
    - What happens in the electron transport chain at the very last coenzyme?
    - What is the difference between aerobic cellular respiration and anaerobic cellular respiration?
- What is meant by chemiosmosis?
- How does chemiosmosis work to provide ATP?
- How many ATP are produced as a result of glycolysis? fermentation? the "prep" reaction? the citric acid cycle?
- What is the final equation including ATP that is produced in fermentation (collective process)? Cellular respiration (collective process)?