Name_____

AP Biology
TEXT: *Biology*, **Campbell and Reece**
7th Edition

Chapter 8 – An Introduction to Metabolism
Guided Reading

1. Compare and contrast the catabolic and anabolic pathways.

2. Define the following terms. These terms and concepts are critical – they would be "great" quiz words.
   a. Energy
   b. Kinetic energy
   c. Heat/thermal energy
   d. Chemical energy
   e. Thermodynamics
   f. First Law of Thermodynamics
   g. Second Law of Thermodynamics
   h. Free Energy

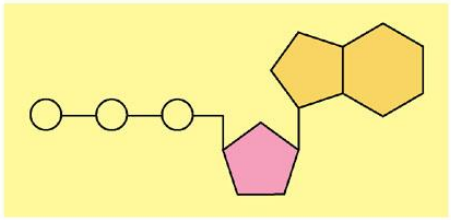
3. Contrast exergonic and endergonic reactions in terms of ***free energy***, ***stability***, and the ***capacity to do work***.

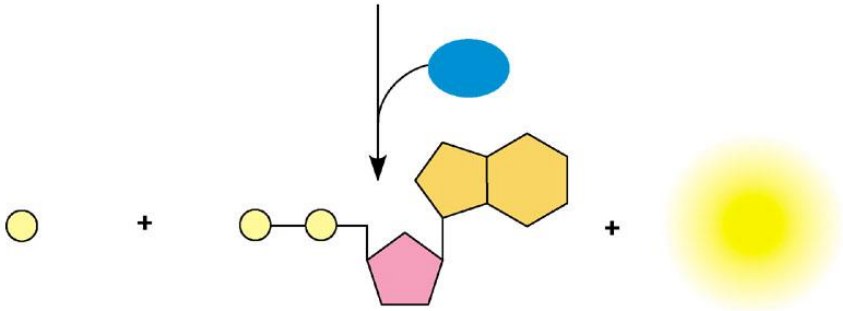
4. How do you know if a reaction is spontaneous?

5. Can a closed system at equilibrium do work? Why or why not?

6. List and give an example of the three main kinds of cellular work done by ATP.

7. Label the diagram below and indicate how cellular work is done by ATP.





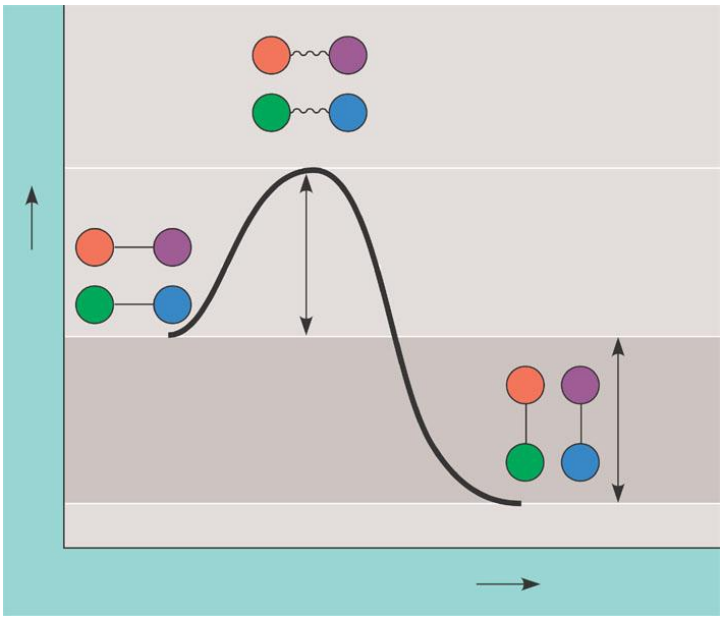
8. Define phosphorylated.

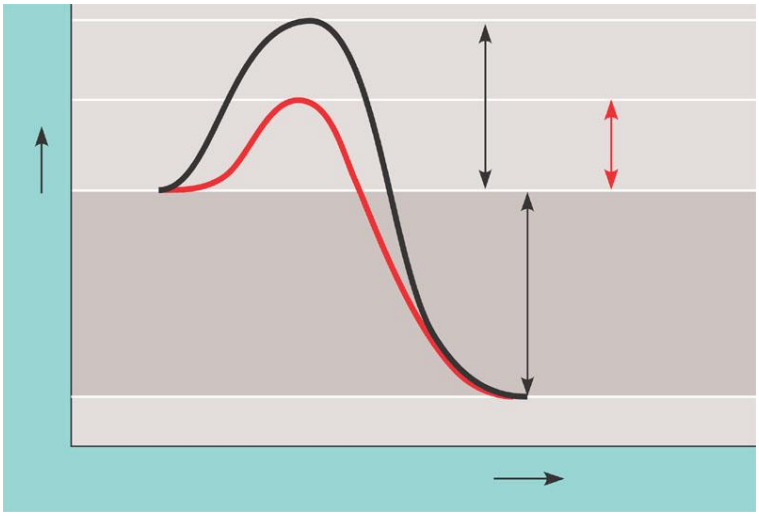
9. ***In your own words***, explain the concept of coupled reactions and ATP doing "work".

10. What is the relationship between exergonic reactions, endergonic reactions and the use and regeneration of ATP?

11. What is activation energy?

12. Label the diagrams below with appropriate labels (i.e. the change in free energy).





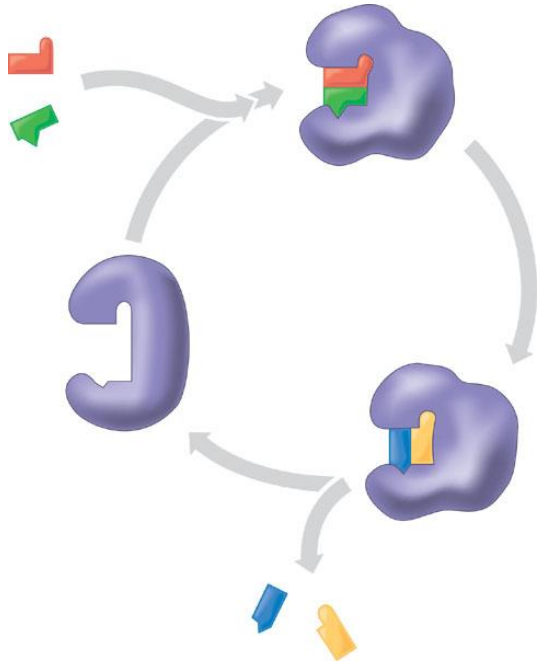
13. Define the following terms:
    a. Substrate

    b. Enzyme substrate complex

    c. Active site

    d. Induced fit

14. Label the following diagram:



15. How do temperature and pH (specifically) affect enzyme activity?

16. Compare and contrast competitive and noncompetitive inhibitors.

17. What is allosteric regulation and how does it assist in the regulation of metabolism?

18. What is cooperativity?

19. How does feedback inhibition work?