

## Unit 3: Energy Study Guide

### GPS Standards and Chapters:

- Energy Flow (*SB4b; Sec. 4-2*): Food Chains, Food Webs & Energy Pyramids
  - Enzymes (*SB1b; Sec. 3-1, 3-4*)
  - Photosynthesis & Cellular Respiration (*SB3a, Ch. 9*)

### Vocabulary:

Food web	Trophic level	Endosymbiotic theory
Food chain	ATP	Photosynthesis
Producers	Enzyme	Chlorophyll
Consumers	Substrate	Cellular respiration
Decomposers	Active site	Carbon cycle
Energy pyramid	Activation energy	

### Study Questions:

#### Energy Flow: Food Web

1. Define the parts of the food chain, including decomposers and scavengers. (Be able to label these trophic levels on an example food web or chain) (6pts)
2. What direction does the energy flow through an ecosystem? (Be able to draw in arrows to show energy flow) (2pts)
3. What is the difference between a food chain and food web? (2pts)
4. What happens to the other trophic levels when the secondary consumers decrease in numbers? (3pts)
5. How much energy is transferred from one trophic level to the next? Why? (2pts)
6. What is an energy pyramid? (1pt)

#### Enzymes

7. What is an enzyme? (1pt)
8. Define active site, activation energy, and substrate. (3pts)
9. How does an enzyme function? (1pt)
10. How does the activation energy change between when there is an enzyme present and without an enzyme? (2pts)
11. What are the 4 characteristics of enzymes? (4pts)
12. What factors can affect the function of enzymes? (2pts)

#### Endosymbiotic Theory

13. What is the endosymbiotic theory? (1pt)
14. What organelles are involved in this theory? (1pt)

### Photosynthesis

15. Define photosynthesis – include the main goal (2pts)
16. Write out the equation for photosynthesis. (5pts)
17. What organelle and organism does photosynthesis? (2pts)
18. What are the 2 parts of photosynthesis and where does each occur in the organelle? (2pts)
19. What is the importance of the pigment found in chlorophyll? (1pt)
20. What is the purpose of the carrier molecules? (1pt)
21. What factors can impact the rate of photosynthesis? (1pt)

### Cellular Respiration

22. Define cellular respiration – include the main goal (2pts)
23. Write out the equation for cellular respiration. (5pts)
24. Write out the equation for how we use ATP for energy. (2pts)
25. What organelle and organisms do cellular respiration? (2pts)
26. How much ATP is made from one glucose molecule (total + how much in each step)? (2pts)
27. What are the 3 parts of cellular respiration and where does each occur in the organelle? (3pts)
28. Explain the 2 types of fermentation and how it affects the energy output for the organism. (2pts)

### Nutrient Cycles

29. Draw and label the parts of the carbon cycle. (2pts)