

Study Guide BSCS Biology Chapter 2

1. List the characteristics of all living things.
2. Describe what is meant by free energy.
3. Define: heterotrophs and list some examples.
4. Define: autotrophs and list some examples.
5. When does free energy become available to organisms?
6. What form of energy do organisms use to store energy?
7. Would you classify an organism as a heterotroph or autotrophs that obtains free energy from inorganic chemicals in the environment?
8. Define: cellular respiration.

9. Define: producers

10. Define: consumers

11. Which of the above terms in #9, #10 applies to heterotrophs and autotrophs?

12. True or False:

- All organisms need energy, and only consumer need nutrients.
- Producers and consumers need energy, and only decomposers need nutrients.
- Living and nonliving sources can provide nutrients and energy.
- Nutrients must be obtained from living sources; however, energy can be obtained from both living and nonliving sources.

13. Which of the following organism can capture energy from sunlight and convert it to chemical energy?

- autotrophs
- producers
- decomposers
- consumers

14. Describe the difference between abiotic and biotic factors.

15. Provide some examples of abiotic and biotic factors.

16. All the ecosystems combine to make up the Earth's _____.

17. Are producers always autotrophs, heterotrophs or both?

18. Decomposers are always autotrophs, heterotrophs, or both?

19. What is a food web? (Include what forms a food web.)

20. Use the diagram below to answer this question.

- a. Name the producer in this diagram.
- b. Name the diagram.
- c. Name the organism that gets its energy from a nonliving source.
- d. Name the organisms which are heterotrophs which rely on dead organisms for energy and nutrients.

21. A wolf eats a rabbit. What happens to the calories contained in the rabbit?

22. Use the diagram below to answer this question.

- a. Most of the energy found in the grass is going to end up where?
 - b. How would you describe the energy flow in an ecosystem?
 - c. Would the total amount of energy that leaves this system as heat have to be greater or equal to the amount of energy entering as light?
 - d. Would the heat that is given off by this ecosystem result in an increase or decrease in the entropy of the universe.
23. You are stranded in a place where there is no vegetation (nothing but ice everywhere). All you have to eat are a crate of 10 chickens and bags of oatmeal. How could you get the most calories out of you food supply?
24. Why would a catfish farmer who is able to produce fish containing 100,000 calories each year need to use fish food that has 1.5 million calories?
25. When chemical reactions occur in cells, heat is given off. When this occurs is there more or less free energy available to this cell?

26. You have a wood stove and after you burn wood ashes are left. Which of the following is true?

- The ashes have more energy and more entropy than the wood they came from.
- The ashes have less energy and less entropy than the wood they came from.
- The ashes have less energy, but more entropy, than the wood they came from.
- The ashes have more energy, but less entropy, than the wood they came from.

27. Why do most chemical reactions in living cells require enzymes?

27. Lactase breaks down milk sugar into a simpler sugar. Which is the enzyme and which is the substrate in this reaction?

28. True or False:

- Because the role of enzymes is to overcome the need for activation energy, temperature is not important.
- A cell must become warm in order for enzyme activity to be high.
- A cell must become cool in order for enzyme activity to be high.
- A cell must remain within a narrow range of temperature in order for enzyme activity to be high.

29. In what form is the energy released from complex molecules oxidized in living cells?

30. The energy we receive from the food we eat is used in the production of _____.

31. What bonds are broken when the energy packed into an ATP molecule is released?

32. Define: oxidation.

33. ATP sometimes referred to as “energy currency”? Why?

34. True or False:

- Cells use ATP to remove wastes.
- Cells use ATP to store energy for the future.
- Cells use ATP to supply activation energy.
- Cells use ATP to allow an organism to move from one place to another.

35. How does physical digestion make the chemical part of digestion easier?

36. Why do most plants rely on intracellular digestion and not extracellular digestions?

37. How is cellulose digested in the stomachs of horses and rabbits?

38. Define: peristalsis. What would happen if this stopped?

39. List the parts of the digestive tract in the correct order.

40. In what part of the digestive system is water removed from food and absorbed back into the body?

41. Are food molecules absorbed into the body in the stomach or the small intestine?

42. In what part of the body does carbohydrate digestion begin, where are they totally digested and what is the final result?

43. What role does the pancreas play in digestion?

44. Describe the relationship between pepsin and pepsinogen.

45. Where does protein digestion occur?

46. Name the enzyme which breaks peptide bonds.

47. Where are fats digested? Can they mix with water?

48. Define: bile

49. What is the name of the fat-digesting enzyme that splits fats into fatty acids and glycerol?

50. Name the end products of digestion.

51. Why is the surface area of the small intestine very large?

52. Another data table to be described in class (4 questions in reference to this table).