

TEST 2 STUDY GUIDE

THE CHARACTERISTICS OF LIFE AND THE CHEMISTRY OF LIFE.

1. How are atoms and elements related? _____

2. The first carbon compounds that scientists studied are called _____ compounds because they came from living organisms. (This word means it contains “carbon”)
3. DNA and RNA are two types of _____. (type of macromolecule)
4. What is the process that changes one set of chemicals into another set of chemicals? _____.
5. What is a substrate?
6. Enzymes affect chemical reactions in living organisms by _____ the activation energy of a reaction.
7. What atoms make up a molecule of water? How many hydrogen and oxygen?
_____.
8. The three particles that make up an atom are called protons, _____, and _____.
9. What type of ion forms when an atom loses electrons? (**positive/negative**)
10. What are the four main groups of carbon-based molecules (macromolecules) ?
_____, _____, _____, and _____.
11. _____ is a term that describes a substance formed by the combination of two or more elements in a definite proportion.
12. The most abundant compound in most living things is _____.
13. What category of carbon-based molecules (macromolecules) includes sugars and starches? _____
14. Fats, oils, and cholesterol are all types of _____.
15. **Identify the reactants in the following chemical equation:**



16. Chemical reactions change substances into different substances by _____ and _____ chemical bonds.
17. The effect of a catalyst on a chemical reaction _____ the activation energy. **(increase/decrease)**
18. When hydrogen and oxygen combine to form water, water is the **(product/reactant)**.
19. _____ are the smallest basic units of matter.
20. The attraction among molecules of different substances is called (example: water sticking to other substances) _____.
21. _____ is the term for the amount of energy that needs to be added for a chemical reaction to start.
22. This type of macromolecule, _____, is the main source of energy for living things.
23. _____ are the basic building blocks of proteins (monomer).
24. A monosaccharide is the monomer of _____.
25. **True or False.** Proteins store and transmit hereditary information.
26. A covalent bond is formed as the result of _____.
27. A _____ is a single unit (1 brick), while a _____ is many units attached together (more than one brick).
28. Cell membranes are made up of _____.
29. The place where the enzyme and the substrate react together is called _____.
30. _____ are macromolecules that are important in muscle contraction and transporting oxygen in the blood.
31. _____ are macromolecules that store genetic information in cells.
32. _____ are commonly called fats and oils and are a major component of cell membranes.
33. _____ are catalytic molecules that help speed up reactions.
34. Glucose, sucrose, starch, and cellulose are examples of _____.

35. List the four macromolecules and the elements that compose them.
36. What is the difference between how ionic and covalent bonds form?
37. How are substrates like keys and enzymes like locks?
38. The prefix mono- means “one,” and the prefix poly- means “many.” How are these meanings related to the terms monomer and polymer?

Directions: Identify which characteristic of living things is being described in each of the statements below. Some may be used more than once!

- A. All living things contain cells.
 - B. All living things contain DNA.
 - C. All living things obtain and use energy.
 - D. All living things reproduce.
 - E. All living things respond to stimuli.
 - F. All living things maintain an internal balance.
 - G. All living things grow and develop
39. ____ An amoeba is a unicellular organism.
 40. ____ When a human steps out into the cold air, the body begins to shiver in order to keep its temperature at 98.6 degrees Fahrenheit.
 41. ____ Green plants produce their own food through the process of photosynthesis.
 42. ____ An adult hydra is producing its offspring through budding.
 43. ____ The roots of a plant grow towards a source of groundwater.
 44. ____ Over three years, Tim's height has increased from 5'4" to 5'11".
 45. ____ A pill bug eats a carrot.
 46. ____ A baby songbird hatches from its egg with both parent songbirds watching.
 47. ____ A tulip opens up in the morning at sunrise and closes up in the evening at sunset.
 48. ____ Identical twins have 99.999% of the same genes.
 49. ____ A caterpillar hibernates in a cocoon, and emerges as a butterfly.

50. _____ A beaver is an organism composed of many different types of cells.
51. _____ A sea worm drops its tail and the tail becomes a new worm.
52. _____ As a sea worm is placed in freshwater, the pulse slows down in order for the worm

53. Indicate how many atoms of each element are in the molecules shown below.

- a. H_2 H _____
- b. LiO Li _____ O _____
- c. H_2SO_4 H _____ S _____ O _____

54. Indicate how many of each molecule is shown below

- a. O_2 O_2 _____
- b. $2H_2$ H_2 _____
- c. $4 KClO_3$ $KClO_3$ _____
- d. $4 Li + O_2 \rightarrow 2 Li_2O$ Li _____ O_2 _____ Li_2O _____

55. What is the difference between sexual and asexual reproduction. _____
