Learning targets for biology chapter 1

When you are answering biology questions, please follow **RARE** response.

Restate the question, **A**nswer the question with a **R**eason and a piece of **E**vidence

Chapter 1

Please answer on a separate piece of paper. Explain all diagrams and figures. Do not copy the caption or print out figures.

1. What are the smallest units into which water can be subdivided and still have the properties of water?
2. What are elements?
3. 97% of all compounds present in organisms contain which 6 elements? What are the other 3% called?
4. What are subatomic particles? Explain each subatomic particle and state the relationship among atoms, protons, neutrons and electrons.
5. Explain and give examples of isotopes. Give names of Isotopes that are used in biological research?
6. Explain the law of conservation of matter.
7. Compare ionic, nonpolar covalent, and polar covalent bonds. Give examples of each bond.
8. Explain hydrogen bonds in detail and draw and explain Figures 1.9 and 1.10 also
9. Using simple molecular models, draw the electric attractions that allow sodium and chloride ions to dissolve in water. (hint: represent water as in Figure 1.9 in your book)
10. Explain the pH scale, and how it is based on a logarithmic scale. Give examples of how small changes in pH can have severe effects on organisms.
11. Define and give examples of monosaccharide, disaccharides and polysaccharides. Draw figure 1.17 and figure 1.18 b
12. On a separate sheet of paper, create a table of the organic compounds. The table should include the following: organic compound, functions, monomers, polymers, named examples, picture of monomer, key information
13. Explain the difference between unsaturated fats and saturated fats. Give examples of both.
14. Animals usually store energy reserves as lipids; plants store them as polysaccharides. What is the advantage to animals of using lipids as storage molecules?
15. Margarine is produce by hydrogenating liquid vegetable oils so they become solids like butter. What chemical change has taken place in the fatty acids?
16. Explain the importance of phospholipids and cholesterol and draw figure 1.20
17. Give some examples of different parts of the body made of proteins.
18. Distinguish between amino acids and peptides and between simple peptides and polypeptides.
18. How are amino acids connected? Draw Figure 1.22a
19. List and describe the four different structures of a protein.
20. Explain the difference between RNA and DNA, and draw figures 1.24 and 1.25
21. Who discovered the structure of the DNA model? Whose ideas did they use to make their discovery?
22. Explain the structure of DNA and specific pairing of bases.
23. What is DNA Replication?
24. How does DNA store information?
25. You are an analytical chemist working in a nutritional analysis laboratory. Someone brings you a tropical food made of only one type of macromolecule. How would you determine whether it is a carbohydrate, fat, protein, or nucleic acid? (Reference: Investigation 1B in book)