Name _____ Date _____ Class _____

CHAPTER 2 DIRECTED READING

Chemistry of Life

▶ Section 2-1: Nature of Matter

Matter is Made of Atoms

Complete each statement by writing the correct term or phrase in the space provided.

1. A(n) _____ is the smallest unit of matter that cannot be broken down by chemical means.
2. A(n) _____ is a substance made of only one kind of atom.

Atoms Can Bond Together

Mark each statement below T *if it is true or* F *if it is false.*

_____ 3. A hydrogen bond is a weak chemical attraction between polar molecules.

_____ 4. A partially filled outer electron level makes an atom stable.

_____ 5. Atoms gain or lose electrons to form ions.

_____ 6. Water is an example of an ionic compound.

_____ 7. Polar molecules have an unequal distribution of electrical charges.

In the space provided, explain how the terms in each pair differ in meaning.

8. molecule, atom

_____

_____

9. compound, element

_____

_____

▶ Section 2-2: Water and Solutions

Water Is a Major Component of Cells

Complete each statement by writing the correct term or phrase in the space provided.

1. _____ heats more slowly than many other substances.
2. When humans sweat, water releases heat through _____ .

3. _____ is an attraction between substances of the same kind, while _____ is an attraction between different substances.

Water Dissolves Many Substances

Read each question, and write your answer in the space provided.

4. Why do ionic compounds dissolve in water?

5. What is a solution?

6. Distinguish between acids and bases.

▶ Section 2-3: Chemistry of Cells

Carbon Compounds Are Found in Living Things

Complete each statement by writing the correct term or phrase in the space provided.

1. The carbon atoms in organic molecules are bonded to other atoms by _____ bonds.

2. The four major classes of organic compounds are _____, _____, _____, and nucleic acids.

3. The building blocks of carbohydrates are _____.

Mark each statement below T *if it is true or* F *if it is false.*

_____ 4. If a carbohydrate molecule contained six carbon atoms, it would also contain six hydrogen atoms.

_____ 5. Humans can digest cellulose.

_____ 6. Fats are lipids that store energy.

Complete each statement by underlining the correct term or phrase in the brackets.

7. Lipids will dissolve in [water / oil].
8. Fats are composed of three fatty acid molecules joined to a molecule of [glycerol / protein].
9. At room temperature, [saturated / unsaturated] fats are usually liquids.
10. A protein is a chain of linked smaller molecules called [amino acids / lipids].

Read each question, and write your answer in the space provided.

11. What two factors determine the shape of a protein?

_____

_____

12. What roles do proteins play in organisms?

_____

_____

In the space provided, write the letter of the description that best matches the term or phrase.

_____ 13. nucleic acid

_____ 14. nucleotide

_____ 15. DNA

_____ 16. RNA

_____ 17. ATP

a. temporarily stores energy
b. involved in the production of proteins
c. subunit of DNA and RNA
d. one of the major classes of organic compounds
e. stores hereditary information

▶ Section 2-4: Energy and Chemical Reactions

Organisms Need Energy for Life Processes

Read each question, and write your answer in the space provided.

1. Why is energy important to living things?

_____

_____

2. How does the energy in food become available to organisms?

_____

_____

In the space provided, write the letter of the description that best matches the term or phrase.

_____ 3. energy

_____ 4. reversible reaction

_____ 5. products

_____ 6. chemical reaction

_____ 7. activation energy

_____ 8. reactants

a. ending materials in a chemical reaction
b. energy needed to start a chemical reaction
c. chemical bonds between atoms are broken and new ones are formed
d. can proceed in the opposite direction
e. the ability to move or change matter
f. beginning materials in a chemical reaction

In the space provided, explain how the terms in each pair differ in meaning.

9. energy-releasing reaction, energy-absorbing reaction

_____

_____

10. reactants, products

_____

_____

Enzymes Help Biochemical Reactions Occur

Read each question, and write your answer in the space provided.

11. What is a catalyst?

_____

_____

12. What is an enzyme?

_____

_____

Complete each statement by writing the correct term or phrase in the space provided.

13. A substance on which an enzyme acts is called a(n) _____ .

14. _____ _____ is a substrate of the enzyme catalase.

15. A(n) _____ _____ is the part of the enzyme into which the substrate fits.

DNA Nucleotides

Purpose: *to demonstrate the chemical nature of DNA bonding and composition*

Procedure

1. Color the nucleotides below using the following key:
   - **Deoxyribose: Red**
   - **Phosphate: Blue**
   - **Adenine: Orange**
   - **Thymine: Yellow**
   - **Cytosine: Purple**
   - **Guanine: Green**
2. Cut out and glue together, then attach to other students' molecules.