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The Chemistry of Life Reading Questions

Part 1. The Nature of Matter

Directions: Read pages 29-33 in your IS textbook and answer the following questions.

1. Define *compound.*

2. How are compounds related to molecules?

3. Explain what a chemical formula is. What information is contained in a chemical formula?

4. What is NaCl and why does it form a 1:1 ratio?

5. How are compounds different than elements?

6. How are atoms in a compound held together?

7. Define *ion.*

8. What is an ***ionic*** bond? Draw a picture and write the chemical formula for an ionic bond?

9. What is a ***covalent*** bond? Draw a picture and write the chemical formula for a covalent bond?

➢ Part 2. Properties of Water, Acids, and Bases

Directions: Read pages 34-37 in your IS textbook and answer the following questions.

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1. Use the structure of a water molecule to explain why it is polar. Be sure to describe the electrical charge of the atoms.

2. Explain why water molecules are attracted to one another. What are hydrogen bonds?

3. Define and give an example of the following term:
   a. Mixture:

   b. Solution

   c. Solute

   d. Solvent

   e. Suspension

4. Compare acidic and basic solution in terms of the H+ ion and OH- ion concentrations.

- **Part 3. Carbon Compounds**

Directions: Read pages 38-42 in your IS textbook book and answer the following questions.

1. What is organic chemistry?

2. In your own words, provide two reasons why the chemistry of carbon is important.

3. Define *macromolecule*.

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4. Define *monomer* and explain the meaning of *monos*.

5. Define *polymer* and explain the meaning of *poly*

6. What is polymerization?

7. The word saccharide comes from the Latin word saccharum, meaning "sugar". What do you think the terms monosaccharide and polysaccharide mean?

8. Explain the relationship between monomers and polymers, using polysaccharides as an example.

9. Explain why proteins are considered polymers but lipids are not.

10. Describe the parts of a nucleotide.

- **Part 4. Chemical Reactions and Enzymes**

Directions: Read pages 43-47 in your IS textbook and answer the following questions.

1. Define *enzyme*

2. What happens to chemical bonds during chemical reaction?

3. What is the relationship between an enzyme and a catalyst?

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4. Describe some factors that may influence enzyme activity.

Part 5. CHALLENGE QUESTIONS

Directions: Read pages 29-47 in your IS textbook and answer the following questions.

1. How are ionic bonds and van der Waals forces similar? How are they different?

2. Explain what the name "carbohydrate" might indicate about the chemical composition of sugars.

3. A change in pH can change the shape of a protein. How might a change in pH affect the function of an enzyme such as hexokinase? Think about the analogy of the lock and key.