

Chemistry in Biology

Section 1 Atoms, Elements, and Compounds

Main Idea

Details

Scan the headings and boldfaced words in Section 1 of the chapter. Predict two things that you think might be discussed.

1. _____
2. _____

Review Vocabulary

Use your book or dictionary to define substance.

substance

New Vocabulary

Compare the terms in the table by defining them.

- atom*
- electron*
- neutron*
- nucleus*
- proton*

- compound*
- covalent bond*
- element*
- ion*
- ionic bond*
- isotope*
- molecule*
- van der Waals force*

Atom		
Nucleus		Electron
Proton	Neutron	

Complete the paragraph below using the terms listed to the left.

A substance that cannot be broken down into other substances is a(n) _____. Carbon-14 is a(n) _____. It has a different number of neutrons than other carbon atoms. A(n) _____ forms when two or more elements combine. The chemical bond that holds the elements together is a(n) _____ when electrons are shared. A substance with this kind of bond is called a(n) _____. An atom that has lost or gained one or more electrons becomes a(n) _____, which carries an electric charge. Two of these oppositely charged atoms can form an electrical attraction called a(n) _____. An attraction between oppositely charged regions of molecules is called a(n) _____.

Study Guide

CHAPTER 6

Section 1: Atoms, Elements, and Compounds

In your textbook, read about the structure of atoms.

Label the diagram of an atom. Use these choices:

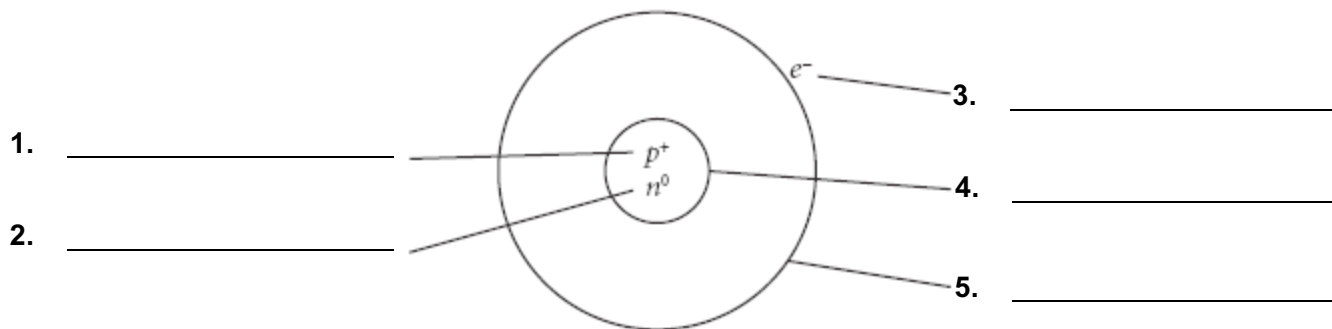
electron

energy level

neutron

nucleus

proton



In your textbook, read about elements, compounds, and chemical bonds.

If the statement is true, write true. If the statement is false, replace the italicized term or phrase to make it true.

6. On the periodic table, each element has a unique name and *formula*.

7. The periodic table is organized into horizontal rows, called periods, and vertical columns, called *elements*.

8. *Water* is composed of hydrogen and oxygen.

9. Atoms of the same element that have different numbers of neutrons are called *isotopes*.

10. The *period* of an element is the amount of time it takes for half of a radioactive isotope to decay.

11. A *combination* is a substance formed when two or more different elements combine.

12. The two main types of chemical bonds are *covalent bonds* and *van der Waals forces*.

Section 2 Chemical Reactions (continued)

Main Idea

Details

Reactants and Products

I found this information on page _____.

Label the sides of the following equation as either products or reactants.



Calculate the number of atoms of each element in the chemical equation above. Record the information in the table below.

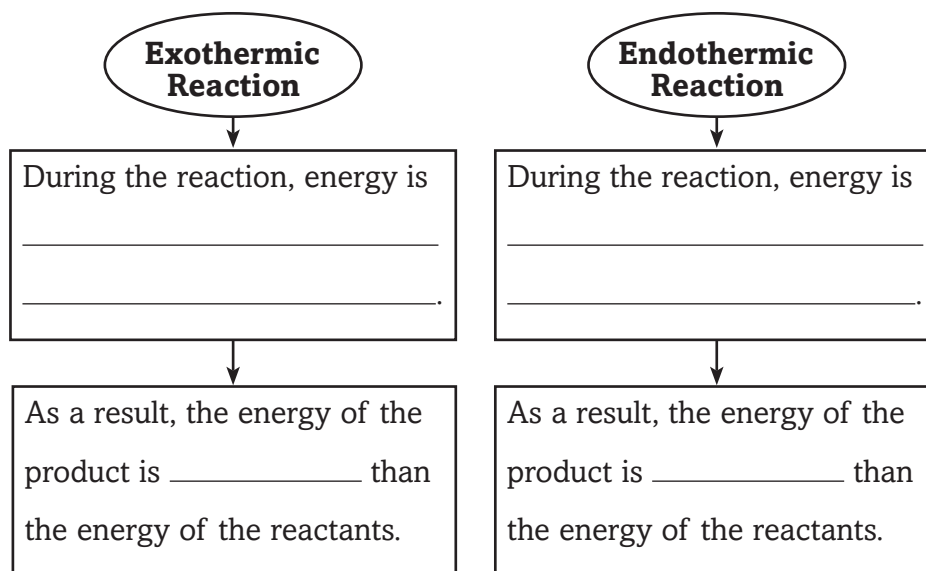
Element Symbol	Element Name	Number of Atoms (reactant side)	Number of Atoms (product side)

Analyze the formula to check to see if it is balanced. Support your reasons.

Energy of Reactions

I found this information on page _____.

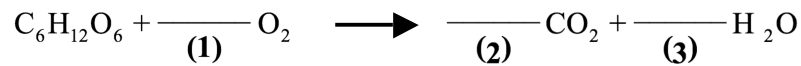
Compare what happens to energy in exothermic and endothermic reactions by completing the diagram below.



Study Guide**CHAPTER 6****Section 2: Chemical Reactions**

In your textbook, read about reactants and products.

Fill in the blanks with the correct number of molecules to balance the chemical equation.



Respond to each statement.

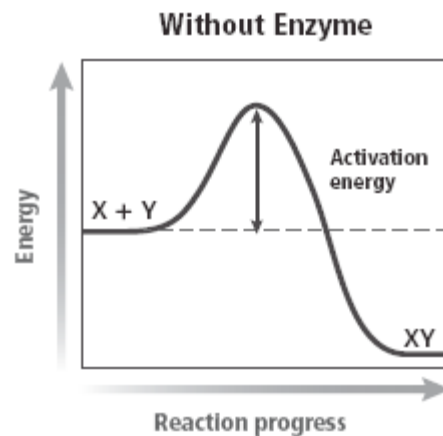
4. **State** the principle that explains why there must be the same number of atoms of each element on each side of an equation.

5. **Identify** which number indicates the number of atoms of each element in a molecule of a substance.

In your textbook, read about activation energy and enzymes.

Refer to the graph of the reaction pathway.

6. Draw a line on the graph that approximates the reaction pathway if an enzyme is added to the reactants.



Match the description in Column A with the term in Column B.

Column A

- _____ 7. minimum amount of energy required for reactants to form products
- _____ 8. substance that lowers energy needed to start a chemical reaction
- _____ 9. protein that is a biological catalyst
- _____ 10. molecule that binds to an enzyme

Column B

- A. enzyme
- B. substrate
- C. activation energy
- D. catalyst

Chemistry in Biology

Section 3 Water and Solutions

Main Idea _____ **Details** _____

Scan Section 3 of the chapter. Identify two facts you discovered about water.

1. _____
2. _____

Review Vocabulary

Use your book or dictionary to define physical property.

physical property

New Vocabulary

Write the correct vocabulary term in the left column for each definition below.

substance that releases hydroxide ions when dissolved in water

substance that releases hydrogen ions when dissolved in water

substance in which another substance is dissolved

mixture that can react with an acid or a base to keep the pH within a particular range

measure of concentration of hydrogen ions in a solution

substance that is dissolved in a solvent

weak interaction involving a hydrogen atom and a fluorine, oxygen, or nitrogen atom

molecule that has oppositely charged regions

mixture that has a uniform composition throughout

combination of two or more substances in which each substance retains its individual characteristics and properties

Academic Vocabulary

Define suspend to show its scientific meaning.

suspend

Study Guide

CHAPTER 6 Section 3: Water and Solutions

In your textbook, read about water's polarity.

Label the diagram. Use these choices:

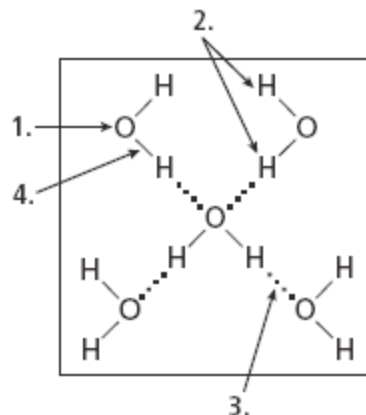
covalent bond

hydrogen bond

slightly negative end

slightly positive end

1. _____
2. _____
3. _____
4. _____



In your textbook, read about mixtures with water.

For each statement below, write true or false.

- | | |
|-------|---|
| _____ | 5. A mixture is a combination of two or more substances in which each substance retains its individual characteristics. |
| _____ | 6. A suspension is a mixture that has a uniform composition throughout. |
| _____ | 7. In a mixture, the solvent is the substance that is dissolved. |
| _____ | 8. A mixture of sand and water is a heterogeneous mixture. |
| _____ | 9. A suspension is a homogeneous mixture in which water is mixed with a substance that does not dissolve in it. |

In your textbook, read about acids and bases.

Use each of the terms below only once to complete the passage.

acids

bases

biology

buffers

hydrogen ions

neutral

pH

Substances that release hydrogen ions when dissolved in water are called

- (10) _____. The more (11) _____ a substance releases, the more acidic the solution becomes. Substances that release hydroxide ions when dissolved in water are called (12) _____. Acids and bases are key substances in (13) _____. The concentration of hydrogen ions in a solution is called (14) _____. Pure water is (15) _____ and has a pH value of 7.0. (16) _____ are weak acids or weak bases that can react with strong acids or strong bases to keep the pH within a particular range.

CHAPTER 6

Study Guide

Section 4: The Building Blocks of Life

In your textbook, read about the building blocks of life.

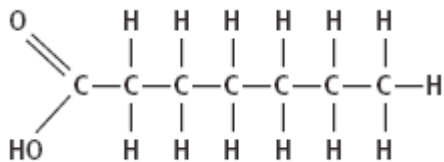
For each statement below, write true or false.

- _____ 1. Carbon atoms can bond together in straight chains, branched chains, or rings.
- _____ 2. Large molecules containing carbon atoms are called micromolecules.
- _____ 3. Polymers are molecules made from repeating units of identical organic compounds that are linked together by hydrogen bonds.
- _____ 4. Carbon is a component of almost all biological substances.
- _____ 5. Macromolecules can be organized into vitamins, lipids, proteins, and nucleic acids.

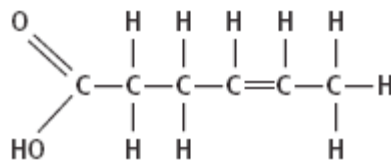
In your textbook, read about carbohydrates, lipids, proteins, and nucleic acids.

Label the diagrams. Use these choices: saturated fat, unsaturated fat.

6. _____



7. _____



Complete the table by checking the correct column(s) for each description.

Description	Carbohydrate	Lipid	Protein	Nucleic Acid
8. Stores coded genetic information				
9. Makes up fats, oils, and waxes in biology				
10. Makes up muscles, skin, and hair				
11. Forms double-helix structures				
12. Is made of amino acids				
13. Includes glucose, lactose, sucrose, and glycogen				
14. Stores energy and is part of membranes				
15. Contains peptide bonds				