

Ch. 2. The Chemistry of Life. Landis

Name _____

Section 2-1 The Nature of Matter (pages 35-39)

This section identifies the three particles that make up atoms. It also explains how atoms of the same element can have a different number of neutrons and describes the two main types of chemical bonds.

Atoms (page 35)

1. Complete the table about subatomic particles.

SUBATOMIC PARTICLES

Particle	Charge	Location in Atom
	Positive	
	Neutral	
	Negative	

Elements and Isotopes (page 36)

2. What is a chemical element?

3. What does an element's atomic number represent?

4. Atoms of the same element that differ in the number of neutrons they contain are known as

Chemical Compounds (page 37)

5. What is a chemical compound?

6. What does the formula for table salt indicate about that compound?

Chemical Bonds (pages 38-39)

Ch. 2. The Chemistry of Life. Landis

CHEMICAL BONDS

Type	Formed when . . .
Covalent bond	
Ionic bond	

7. What is an ion?

8. Is the following sentence true or false? An atom that loses electrons has a negative charge.

9. The slight attractions that develop between oppositely charged regions of nearby molecules are called

Section 2–2 Properties of Water (pages 40–43)

This section describes the makeup of water molecules. It also explains what acidic solutions and basic solutions are.

The Water Molecule (pages 40–41)

10. Is the following sentence true or false? A water molecule is neutral.

11. What results from the oxygen atom being at one end of a water molecule and the hydrogen atoms being at the other end?

12. Circle the letter of each sentence that is true about hydrogen bonds.

a. A hydrogen bond is stronger than an ionic bond.

b. The attraction between the hydrogen atom on one water molecule and the oxygen atom on another water molecule is an example.

c. A hydrogen bond is stronger than a covalent bond.

d. They are the strongest bonds that form between molecules.

13. Complete the table about forms of attraction.

Ch. 2. The Chemistry of Life. Landis

FORMS OF ATTRACTION

Form of Attraction	Definition
Cohesion	
Adhesion	

14. Why is water extremely cohesive?

15. The rise of water in a narrow tube against the force of gravity is called

16. How does capillary action affect plants?

Solutions and Suspensions (pages 41-42)

17. A mixture of two or more substances in which the molecules of the substances are evenly mixed is called a(an)

18. The greatest solvent in the world is

19. Complete the table about substances in solutions.

SUBSTANCES IN SOLUTIONS

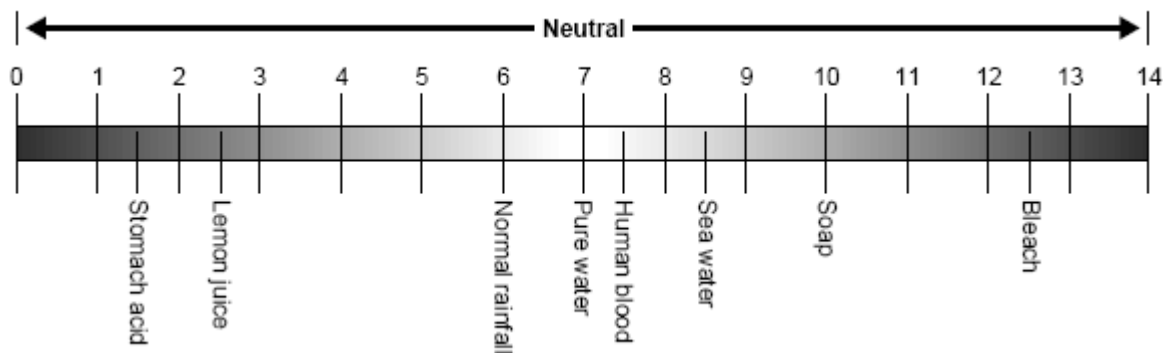
Substance	Definition	Saltwater Solution
Solute		
		Water

Acids, Bases, and pH (pages 42-43)

20. What does the pH scale indicate?

21. On the pH scale below, indicate which direction is increasingly acidic and which is increasingly basic.

Ch. 2. The Chemistry of Life. Landis



22. How many more H^+ ions does a solution with a pH of 4 have than a solution with a pH of 5?
23. Circle the letter of each sentence that is true about acids.
- Acidic solutions have pH values below 7.
 - An acid is any compound that forms H^+ ions in solution.
 - Strong acids have pH values ranging from 11 to 14.
 - Acidic solutions contain higher concentrations of H^+ ions than pure water.
24. Circle the letter of each sentence that is true about bases.
- Alkaline solutions have pH values below 7.
 - A base is a compound that produces OH^- ions in solution.
 - Strong bases have pH values ranging from 11 to 14.
 - Basic solutions contain lower concentrations of H^+ ions than pure water.

Section 2–3 Carbon Compounds (pages 44–48)

This section explains how the element carbon is able to form millions of carbon, or organic, compounds. It also describes four groups of organic compounds found in living things.

The Chemistry of Carbon (page 44)

25. What gives carbon the ability to form chains that are almost unlimited in length?

Macromolecules (page 45)

26. What is a macromolecule?

Ch. 2. The Chemistry of Life. Landis

27. What are four groups of organic compounds found in living things?

Carbohydrates (pages 45-46)

28. What atoms make up carbohydrates?

29. Circle the letter of each sentence that is true about carbohydrates.

- a. Starches and sugars are examples of carbohydrates.
- b. Living things use them as their main source of energy.
- c. The monomers in sugar polymers are starch molecules.
- d. Plants and some animals use them for strength and rigidity.

Lipids (pages 46-47)

30. What kinds of atoms are lipids mostly made up of?

16. Circle the letter of each way that fats are used in living things.

- a. As parts of biological membranes
- b. To store energy
- c. To give plants rigidity
- d. As chemical messengers

Nucleic Acids (page 47)

31. What is the function of nucleic acids in living things?

32. What are two kinds of nucleic acids?

Proteins (pages 47-48)

33. What are four roles that proteins play in living things?

Section 2-4 Chemical Reactions and Enzymes (pages 49-53)

This section describes what happens to chemical bonds during chemical reactions. It also explains how energy changes affect whether a chemical reaction will occur and describes the importance of enzymes to living things.

Ch. 2. The Chemistry of Life. Landis

Chemical Reactions (page 49)

34. What is a chemical reaction?

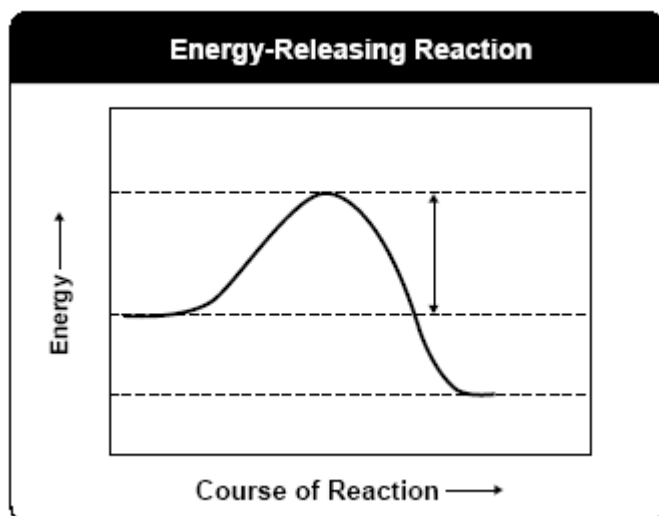
Energy in Reactions (page 50)

35. What is released or absorbed whenever chemical bonds form or are broken?

36. What do chemical reactions that absorb energy need to occur?

37. Chemists call the energy needed to get a reaction started the

38. Complete the graph of an energy releasing reaction by adding labels to show the energy of the reactants, the energy of the products, and the activation energy.



Enzymes (pages 51-52)

39. What is a catalyst?

40. Proteins that act as biological catalysts are called

41. How do cells use enzymes?