Answer Key

Directed Reading A

SECTION: ARRANGING THE ELEMENTS

1. Answers may vary. Sample answer: Scientists might have been frustrated because the elements weren't organized and therefore their properties couldn't be predicted.
2. D
3. periodic
4. periodic table of the elements
5. Mendeleev was able to predict the properties of unknown elements by using the pattern of properties in the periodic table.
6. D
7. periodic law
8. C
9. Chemical symbols are color-coded on the periodic table according to state. The color of the chemical symbol for carbon is red, which corresponds to a solid.
10. properties
11. electrons
12. Answers may vary. Sample answer: The zigzag line can help me recognize which elements are metals, which are nonmetals, and which are metalloids.
13. metals
14. ductile
15. solid
16. It means that most metals can be flattened with a hammer and will not shatter.
17. aluminum
18. nonmetals
19. metalloids
20. B
21. C
22. chemical symbol
23. periods
24. groups, families
25. mendelevium, californium

SECTION GROUPING THE ELEMENTS

1. C
2. B
3. alkali metals
4. alkaline-earth metals
5. cement and chalk
6. Answers may vary. Sample answer: Calcium is an important part of a compound that keeps your bones and teeth healthy.
7. Accept three from this list: beryllium, magnesium, strontium, barium, and radium.
8. B
9. transition metals
10. Answers may vary. Sample answer: Mercury is in a liquid state at room temperature. The other transition metals are solids at room temperature.
11. lanthanides, actinides
12. europium
13. americium
14. Answers may vary. Sample answer: Aluminum was considered more valuable than gold.
15. Answers may vary. Sample answer: Aluminum is used in making aircraft parts, lightweight automobile parts, foil, cans, and siding.
16. silicon, germanium
17. proteins, fats, and carbohydrates
18. diamond
19. Answers may vary. Sample answer: used as a jewel and on cutting tools, such as saws, drills, and files
20. soot
21. gas
22. five
23. hydrogen
24. Answers may vary. Sample answer: Oxygen is a gas at room temperature. The other four elements are solids.
25. sulfur
26. Answers may vary. Sample answer: Oxygen, which makes up about 20% of air, is important to most living things. It is also necessary for substances to burn.

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27. halogens
28. Both are used as disinfectants.
29. salts, sodium chloride
30. Answers may vary. Sample answer: Chlorinating water helps protect people from many diseases by killing the organisms that cause the diseases.
31. C
32. noble gases
33. density
34. D

Directed Reading B

SECTION: ARRANGING THE ELEMENTS

1. D
2. A
3. C
4. C
5. B
6. A
7. C
8. A
9. metals
10. nonmetals
11. metalloids
12. semiconductors
13. mendelevium
14. californium
15. chemical symbol
16. C
17. C
18. C
19. B
20. B

SECTION: GROUPING THE ELEMENTS

1. C
2. B
3. B
4. A
5. B
6. D
7. C
8. C
9. C
10. A
11. Boron
12. aluminum
13. carbon
14. tin
15. B
16. D
17. A
18. B
19. A
20. B
21. D
22. C
23. C
24. A
25. C

Vocabulary and Section Summary

SECTION: ARRANGING THE ELEMENTS

1. periodic: describes something that occurs or repeats at regular intervals
2. periodic law: the law that states that the repeating chemical and physical properties of elements change periodically with the atomic numbers of the elements
3. period: in chemistry, a horizontal row of elements in the periodic table
4. group: a vertical column of elements in the periodic table; elements in a group share chemical properties

SECTION: GROUPING THE ELEMENTS

1. alkali metal: one of the elements of Group 1 of the periodic table (lithium, sodium, potassium, rubidium, cesium, and francium)
2. alkaline-earth metal: one of the elements of Group 2 of the periodic table (beryllium, magnesium, calcium, strontium, barium, and radium)
3. halogen: one of the elements of Group 17 of the periodic table (fluorine, chlorine, bromine, iodine, and astatine); halogens combine with most metals to form salts
4. noble gas: one of the elements of Group 18 of the periodic table (helium, neon, argon, krypton, xenon, and radon); noble gases are unreactive

Section Review

SECTION: ARRANGING THE ELEMENTS

1. Sample answer: *Periodic* means "happening in a regular repeating pattern."
2. C
3. A period in the periodic table is a horizontal row of elements. A group is a vertical column of elements.
4. atomic mass
5. The repeating chemical and physical properties of elements change periodically with the atomic numbers of the elements.

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