Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Chapter 15 Multi-format Test

Modified True/False
Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

____ 1. Elements with similar properties, listed in a single column on the periodic table, form what is called a *group*. _____

____ 2. A property that can only be observed when one substance changes into a different substance is called a *chemical* property. _____

____ 3. On the periodic table, metals are found, in general, on the *left* side of the table. _____

____ 4. Solid elements described as dull, brittle, and poor electrical and thermal conductors are most likely *metals*. _____

____ 5. The group of elements that tend to be found as toxic gases or liquids in their pure form, including chlorine, bromine and iodine, are called the *alkali metals*. _____

____ 6. Properties such as boiling point, phase, density, and specific heat are known as *chemical* properties. _____

Completion
Complete each statement.

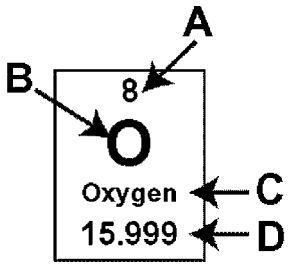
Select the correct term to complete each sentence. There are extra terms in the list.

groups	rows	periods
noble	halogens	metalloids
alkali	nonmetals	periodicity

7. The group identified as inert gases because their atoms do not form chemical bonds with other atoms is also known as the _____ gases.
8. Horizontal rows on the periodic table are called _____.
9. On the periodic table, elements with similar properties are placed in vertical columns called _____.
10. Elements on the periodic table that have properties between metals and non-metals are called _____
11. Helium belongs to the vertical group on the periodic table known as the _____.
12. When reading across rows of the period table, patterns of chemical and physical properties tend to be repeated. This pattern is called _____

Matching

For the following element, match the letter with the type of information given.



____ 13. name of element
____ 14. atomic mass
____ 15. symbol
____ 16. atomic number

Short Answer

17. Chemical and physical changes represent two ways in which a substance may be altered. Which change is more difficult to reverse?

18. The periodic table was developed by scientists over a number of years after much investigation.What properties were used to organize the periodic table?

19. Two particles found in the nucleus of most atoms have masses equivalent to one atomic mass unit, or 1 amu. Name the particles.

20. Describe the reason the atomic mass of magnesium is listed as 24.31 amu when magnesium has 3 stable isotopes: Mg^{24}, Mg^{25}, and Mg^{26}. Which isotope is the most commonly found on Earth?

21. Which makes a better insulator, metals or nonmetals?

Name: _____ **ID: A**

Problem

Use the diagram of the periodic table below to answer the following questions.

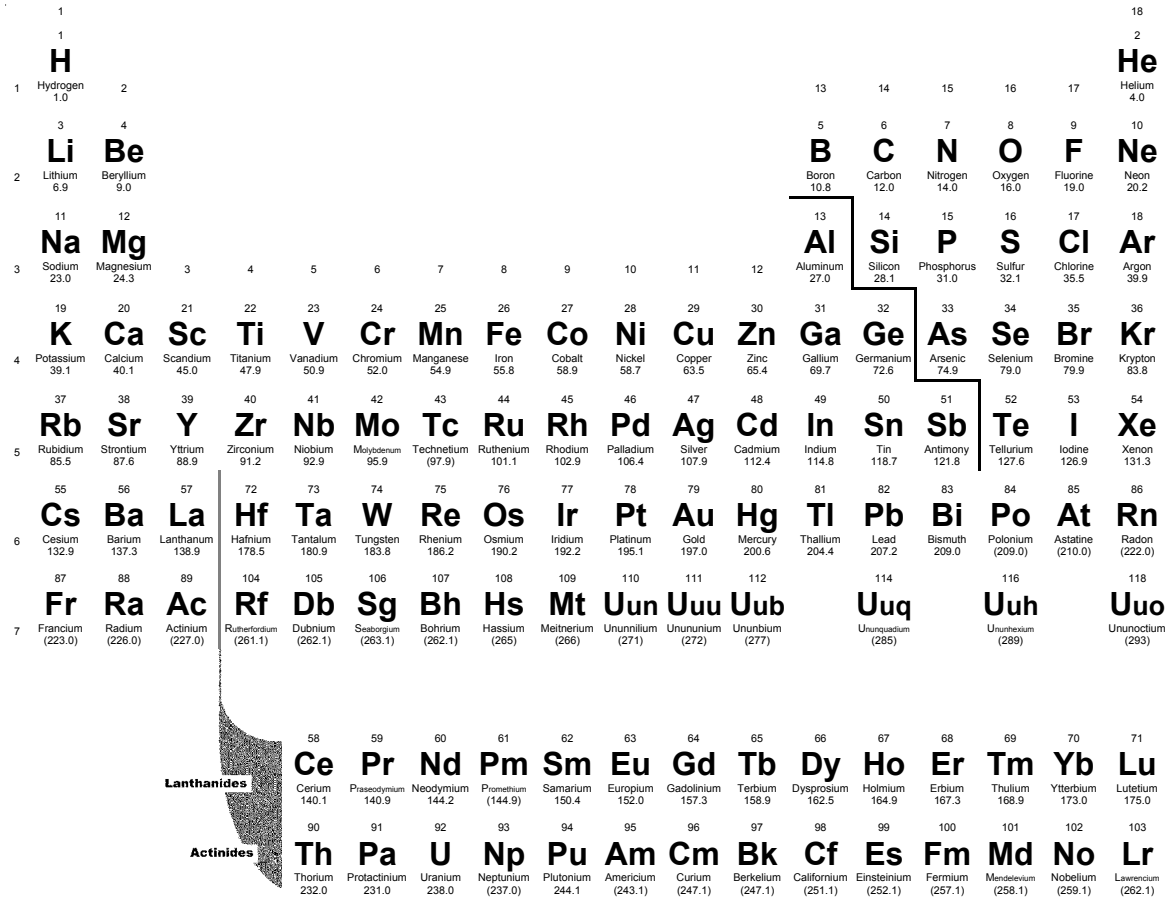
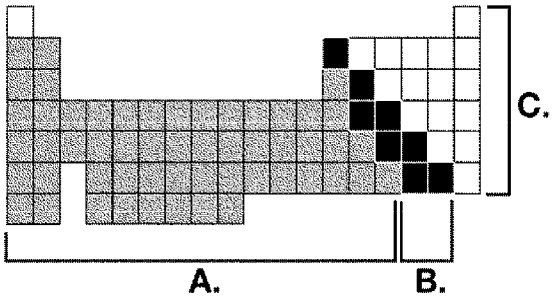


Figure 15-1 The Periodic Table of the Elements

22. Referencing **Figure 15-1**, in which group are the alkali metals located?
23. Referencing **Figure 15-1**, in which group are the noble gases located?
24. Referencing **Figure 15-1**, in which group are the halogens located?
25. Referencing **Figure 15-1**, in which groups are the transition metals located?
26. Referencing **Figure 15-1**, how many energy levels are in a calcium atom?

27. The diagram below represents the periodic table of elements. It is shaded in three tones to represent areas in the periodic table where non-metals, metals and metalloids are located.

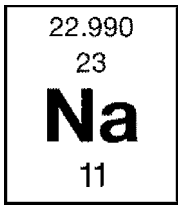


Identify the areas in which the three types of elements would be found on the periodic table by placing the letters A, B and C next to the element types.

Non-metal _____ Metal _____ Metalloid _____

Essay

28. Each element is represented on the periodic table by a box containing numbers and a letter or letters. Explain what is meant by each number and the letters for the element sodium, which is represented in the following diagram.



29. Give two reasons silicon is of economic importance.

30. What are alloys and why are they widely used? Include two examples of alloys in your answer.

Chapter 15 Multi-format Test
Answer Section

MODIFIED TRUE/FALSE

1. ANS: T DIF: basic REF: section 15.1
2. ANS: T DIF: basic REF: section 15.1
3. ANS: T DIF: basic REF: section 15.1
4. ANS: F, Non-metals

   DIF: basic REF: section 15.1
5. ANS: F, halogens

   DIF: intermediate REF: section 15.1
6. ANS: F, physical

   DIF: basic REF: section 15.1

COMPLETION

7. ANS: noble

   DIF: basic REF: section 15.1
8. ANS: periods

   DIF: basic REF: section 15.1
9. ANS: groups

   DIF: basic REF: section 15.1
10. ANS: metalloids

    DIF: basic REF: section 15.1
11. ANS: halogens

    DIF: basic REF: section 15.1
12. ANS: periodicity

    DIF: basic REF: section 15.1

MATCHING

13. ANS: C DIF: basic
14. ANS: D DIF: basic
15. ANS: B DIF: basic
16. ANS: A DIF: basic

SHORT ANSWER

17. ANS:
chemical

DIF: basic REF: section 15.1

18. ANS:
chemical properties

DIF: basic REF: section 15.1

19. ANS:
The proton and neutron

DIF: basic REF: section 15.1

20. ANS:
Atomic mass is the average atomic mass for a sample of magnesium found on Earth. Since there are 3 stable isotopes, a sample of magnesium will contain a mixture of all 3. Since the average is 24.31 amu, there is more Mg^{24} than the heavier isotopes.

DIF: advanced REF: section 15.1

21. ANS:
nonmetals

DIF: basic REF: section 15.2

PROBLEM

22. ANS:
group 1

DIF: intermediate REF: section 15.1

23. ANS:
group 18

DIF: intermediate REF: section 15.1

24. ANS:
group 17

DIF: intermediate REF: section 15.1

25. ANS:
groups 3-12

DIF: intermediate REF: section 15.1

26. ANS:
4 energy levels

DIF: intermediate REF: section 15.1

27. ANS:

Non-metal - C Metal- A Metalloid - B

DIF: intermediate REF: section 15.1

ESSAY

28. ANS:

The number **22.990** represents the atomic weight of an "average" sodium atom. The number **23** represents the mass number, the number of protons + neutrons, of the stable isotope of sodium. The letters **Na** represent the chemical symbol for sodium. The number **11** is the atomic number, the number of protons, for sodium.

DIF: intermediate REF: section 15.1

29. ANS:

Answers will vary but may include the following:

a. Many gemstones (rubies, emeralds) are compounds of silicon and oxygen with traces of other elements.
b. Window glass is made from silicon and oxygen, pure silica (SiO^2).
c. Silicon crystals in very pure form are used to make semiconductors for computers.

DIF: basic REF: section 15.2

30. ANS:

Alloys are metals mixed with some impurities that generally make the metal much stronger than the elemental metal. For example, mixing carbon with iron produces an alloy used to make nails. Brass is an alloy made from copper and zinc which is much stronger than either of the metals from which it is made.

DIF: intermediate REF: section 15.2

T 1.

T 2.

T 3.

F 4.

F 5.

F 6.

C 13.
D 14.
B 15.
A 16.