Name _____ Class _____ Date _____

Skills Worksheet

Directed Reading B

Section: Development of the Atomic Theory (pp. 164–171)

THE BEGINNING OF ATOMIC THEORY

_____ **1.** The word *atom* comes from the Greek word *atomos*, which means
- **a.** "dividable."
- **b.** "invisible."
- **c.** "hard particles."
- **d.** "not able to be divided."

2. The smallest unit of an element that maintains the properties of that element is a(n) _____.

DALTON'S ATOMIC THEORY BASED ON EXPERIMENTS

_____ **3.** Which of the following was NOT part of Dalton's theory?
- **a.** All substances are made of atoms.
- **b.** Atoms of the same element are exactly alike.
- **c.** Atoms of different elements are alike.
- **d.** Atoms join with other atoms to make new substances.

4. Dalton experimented with different substances. What did his results suggest?

_____

_____

_____

THOMSON'S DISCOVERY OF ELECTRONS

5. In Thomson's experiments with a cathode-ray tube, he discovered that a(n) _____ charged plate attracted the beam. He concluded that the beam was made up of particles that have _____ electric charges.

6. The negatively charged subatomic particles that Thomson discovered are now called _____.

7. In Thomson's "plum-pudding" model, electrons are mixed throughout a(n) _____.

RUTHERFORD'S ATOMIC "SHOOTING GALLERY"

_____ **8.** Before his experiment, what did Rutherford expect the particles to do?
- **a.** He expected the particles to pass right through the gold foil.
- **b.** He expected the particles to deflect to the sides of the gold foil.
- **c.** He expected the particles to bounce straight back.
- **d.** He expected the particles to become negatively charged.

9. What were the surprising results of Rutherford's gold-foil experiment?

_____

_____

_____

THE NUCLEUS AND THE ELECTRONS

_____ **10.** In 1911, Rutherford revised the atomic theory. Which of the following is NOT part of that theory?
- **a.** Atoms are mostly empty space.
- **b.** The nucleus is a tiny, dense, positively charged region.
- **c.** Positively charged particles that pass close by the nucleus are pushed away by the positive charges in the nucleus.
- **d.** The nucleus is made up of protons and electrons.

11. How did Rutherford's model describe the atom?

_____

_____

Match the correct description with the correct term. Write the letter in the space provided.

_____ **12.** an atom's central region, made up of protons and neutrons

_____ **13.** region around the nucleus where electrons are likely to be found

_____ **14.** particles that Bohr suggested move around the nucleus in definite paths

- **a.** electrons
- **b.** electron cloud
- **c.** nucleus

15. Each electron's definite energy is based on its _____.

THE SIZE OF AN ATOM

_____ **16.** Which of the following statements is true?

a. A penny has about 20,000 atoms.
b. A penny has more atoms than Earth has people.
c. Aluminum is made up of large-sized atoms.
d. Aluminum atoms have a diameter of about 3 cm.

17. One of the tools that scientists now use to observe atoms is the _____.

Name _____ Class _____ Date _____

Skills Worksheet

Directed Reading B

Section: The Atom (pp. 172–179)

THE PARTS OF AN ATOM

Match the correct description with the correct term. Write the letter in the space provided.

_____ **1.** particle found in the nucleus that has no electrical charge

_____ **2.** particle found in the nucleus that is positively charged

_____ **3.** particle with an unequal number of protons and electrons

_____ **4.** negatively charged particle found outside the nucleus

_____ **5.** contains most of the mass of an atom

_____ **6.** SI unit that describes the mass of an atom or molecule

a. electron
b. atomic mass unit (amu)
c. nucleus
d. proton
e. ion
f. neutron

ATOMS AND ELEMENTS

7. The simplest atom is the _____ atom. It has one _____ and one _____.

8. Neutrons in the atom's _____ keep two or more protons from moving apart.

9. If you build an atom using two protons, two neutrons, and two electrons, you have built an atom of _____.

10. An atom does not have to have equal numbers of _____ and _____.

11. The number of protons in the nucleus of an atom is the _____ of that atom.