Chapter 16 A & B — Physical Science

Read pages 382 - 392.

1. List the five things John Dalton suggested were true about atoms and elements.

2. What did J. J. Thomson discover?

3. What was Thomson's model of the atom called?

4. What did Ernest Rutherford discover?

5. Why was Rutherford's model of the atom incomplete?

6. Who found the information missing from Rutherford's model and what was that information?

7. What do the rings on Bohr's model of the atom represent?

8. What does an electron have to do to jump to a higher energy level?

9. What does an electron have to do to go down to a lower energy level?

10. What is the current model of the atom called?

11. List the charges on a proton, a neutron and an electron.

12. List the particles in order from smallest to largest: proton, neutron, electron

13. Which particles make up the nucleus of an atom?

14. What does the atomic number of an element equal?

15. What is a mass number?

16. What is the symbol (including mass and atomic numbers) for the element that has 23 protons, 25 neutrons, and 23 electrons?

17. Fill in the blanks:

Isotope	Protons	Neutrons	Electrons
$^{79}_{35}$Br			
^{127}I			
	79	112	

Chapter 16 B & C — Physical Science

Read pages 393 - 404.

1. Look up the definition of *atomic mass* and *mass number* in the glossary. What is the difference between the atomic mass and mass number of an element?

2. What do the circles on the electron configuration diagrams represent?

3. What is the "ground state" of an atom?

4. What are valence electrons?

5. Use the A numbers on the periodic table to determine how many valence electrons each atom has:
   a. Mg
   b. O
   c. Br
   d. Kr
   e. B
   f. Na

6. Why do atoms with larger atomic numbers need more neutrons than protons?

7. What is an alpha particle?

8. What is a beta particle?

9. What are gamma rays?

10. How does the nucleus change through gamma decay?

11. How does the nucleus change through alpha decay?

12. How does the nucleus change through beta decay?

13. Which type of radiation is most damaging: alpha, beta, or gamma radiation?

14. Look up the definition of "half-life" in a dictionary or encyclopedia. Write it here.

15. Explain the difference between nuclear fission and nuclear fusion.

16. Which type of nuclear reaction (fission or fusion) is used in each technology listed below:
    a. Atomic bombs
    b. The sun and stars
    c. Power plants that generate electricity

17. List three advantages of fusion over fission.

18. If fusion has more advantages than fission, why don't we use it to produce electricity?