Name _____ Class _____ Date _____

Section 4.1 Studying Atoms

(pages 100-105)

This section discusses the development of atomic models.

Reading Strategy (page 100)

Summarizing As you read, complete the table about atomic models. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Atomic Models		
Scientist	**Evidence**	**Model**
	Ratio of masses in compounds	
	Deflected beam	
Rutherford		Positive, dense nucleus

Ancient Greek Models of Atoms (page 100)

1. Democritus named the smallest particles of matter _____ because they could not be divided.

2. List the four elements that Aristotle included in his model of matter.

a. _____ b. _____

c. _____ d. _____

Dalton's Atomic Theory (page 101)

3. Is the following sentence true or false? John Dalton gathered evidence for the existence of atoms by measuring the masses of elements that reacted to form compounds. _____

4. What theory did Dalton propose to explain why the elements in a compound always join in the same way? _____

_____

5. Circle the letters of the sentences that represent the main points of Dalton's theory of atoms.

a. All elements are composed of atoms.

b. In a particular compound, atoms of different elements always combine the same way.

c. All atoms have the same mass.

d. Compounds contain atoms of more than one element.

Thomson's Model of the Atom (pages 102–103)

6. Objects with like electric charges _____, and objects with opposite electric charges _____.

7. What happened to the beam when Thomson placed a pair of charged metal plates on either side of the glass tube? _____

_____

8. Thomson concluded that the particles in the glowing beam had a(n) _____ charge because they were attracted to a positive plate.

9. Is the following sentence true or false? Thomson's experiments provided the first evidence for the existence of subatomic particles.

_____

10. Describe Thomson's model. _____

_____

Rutherford's Atomic Theory (pages 104–105)

11. What is an alpha particle? _____

_____

12. Fill in the table to show what Rutherford hypothesized would happen to the paths of alpha particles as they passed through a thin sheet of gold.

Rutherford's Hypothesis	
Most particles would travel _____ from their source to a screen that lit up when struck.	Particles that did not pass straight through would be _____ _____

13. Circle the letters of the sentences that describe what happened when Marsden directed a beam of particles at a piece of gold foil.

a. Fewer alpha particles were deflected than expected.

b. More alpha particles were deflected than expected.

c. None of the alpha particles were deflected.

d. Some alpha particles bounced back toward the source.

14. Circle the letter of the sentence that states what Rutherford concluded from the gold foil experiment.

a. An atom's negative charge is concentrated in its nucleus.

b. Thomson's model of the atom was correct.

c. An atom's positive charge is concentrated in its nucleus.

d. An atom's positive charge is spread evenly throughout the atom.