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**
Dalton		Indivisible, solid spheres
	Deflected beam	Negative charges evenly scattered through positively charged mass of matter (plum pudding model)
	Deflection of alpha particles passing through gold foil	

Ancient Greek Models of Atoms (page 100)

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

Dalton's Atomic Theory (page 101)

2. 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. _____
3. Dalton's theory suggests that all matter is made up of individual particles called _____, which cannot be _____.
4. Circle the letters of the sentences that represent 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.

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

5. Use the words in the box below to fill in the blanks. Objects with like electric charges _____, and objects with opposite electric charges _____.

attract	deflect
reflect	repel

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

7. Circle the letter of the sentences that describe Thomson's model of the atom.

a. An atom is filled with positive matter.
b. An atom is mostly space with a small nucleus.
c. Negative charges are scattered throughout an atom.

Rutherford's Atomic Theory (pages 104–105)

8. An _____ is a fast-moving particle that carries a positive charge.

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

a. More alpha particles were deflected than expected.
b. None of the alpha particles were deflected.
c. Some alpha particles bounced back toward the source.

10. 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. An atom's positive charge is concentrated in its nucleus.
c. An atom's positive charge is spread evenly throughout the atom.