

Name _____ Date _____ Class _____

CHAPTER 4 STUDY GUIDE FOR CONTENT MASTERY

The Structure of the Atom

Section 4.1 Early Theories of Matter

In your textbook, read about the philosophers, John Dalton, and defining the atom.

For each statement below, write *true* or *false*.

1. Ancient philosophers regularly performed controlled experiments. true
2. Philosophers formulated explanations about the nature of matter based on their own experiences. true
3. Both Democritus and Dalton suggested that matter is made up of atoms. true
4. Dalton's atomic theory stated that atoms separate, combine, or rearrange in chemical reactions. false
5. Dalton's atomic theory stated that matter is mostly empty space. false
6. Dalton was correct in thinking that atoms could not be divided into smaller particles. true
7. Dalton's atomic theory stated that atoms of different elements combine in simple whole-number ratios to form compounds. true
8. Dalton thought that all atoms of a specific element have the same mass. false
9. Democritus proposed that atoms are held together by chemical bonds, but no one believed him. true
10. Dalton's atomic theory was based on careful measurements and extensive research. false
11. There are no instruments powerful enough to magnify atoms so that they can be seen. true
12. The smallest particle of an element that retains the properties of that element is called an atom. true

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Section 4.2 Subatomic Particles and the Nuclear Atom

In your textbook, read about discovering the electron and the nuclear atom.

For each item in Column A, write the letter of the matching item in Column B.

Column A

- a _____ 1. Proposed the nuclear atomic model
- b _____ 2. Determined the mass-to-charge ratio of an electron
- c _____ 3. Calculated the mass of an electron

Column B

- a. Thomson
- b. Millikan
- c. Rutherford

Draw and label a diagram of each atomic model.

4. plum pudding model

Drawing should look like a ball of chocolate chip cookie dough. The chocolate chips should be labeled with negative charge or as electrons. The dough should be labeled as evenly distributed positive charges.

5. nuclear atomic model

Drawing should look like a peach with a pit. The pit should be labeled nucleus and should include labeled protons and neutrons. The outer circle of the peach should be labeled electrons.

In your textbook, read about the discovery of protons and neutrons.

Complete the following table of proton, electron, and neutron characteristics.

Particle	Symbol	Location	Relative Charge	Relative Mass
6. Proton	p ⁺	In the nucleus	1+	1
7. Neutron	n ⁰	In the nucleus	0	1
8. Electron	e ⁻	In the space surrounding the nucleus	1-	1/1840