

Elements and the Periodic Table ▪ Guided Reading and Study

Introduction to Atoms (pp. 102–108)

This section describes the development of atomic models and the structure of atoms.

Use Target Reading Skills

Before you read, preview the diagram of a carbon atom in your textbook. Then, complete the graphic organizer by writing two questions about the diagram. As you read, answer your questions.

Structure of an Atom

Q. What particles are in the center of an atom?
A.
Q.
A.

Development of Atomic Models (pp. 103–105)

1. Is the following sentence true or false? Atoms are the smallest particles of matter. _____
2. Circle the letter of each sentence that is part of John Dalton's atomic theory.
 - a. All elements are composed of atoms.
 - b. No two atoms of the same element are exactly alike.
 - c. An atom of one element cannot be changed into an atom of a different element.
 - d. Atoms cannot be created or destroyed in any chemical changes.
3. Is the following sentence true or false? With only a few changes, Dalton's atomic theory is still accepted today. _____
4. Who described the atom as negative charges scattered through a ball of positive charges? _____
5. What experiment convinced Ernest Rutherford that the atom has a small, positively charged nucleus? _____
6. The term Rutherford gave to the positively charged particles in the nucleus of an atom was _____.

Elements and the Periodic Table ▪ *Guided Reading and Study*

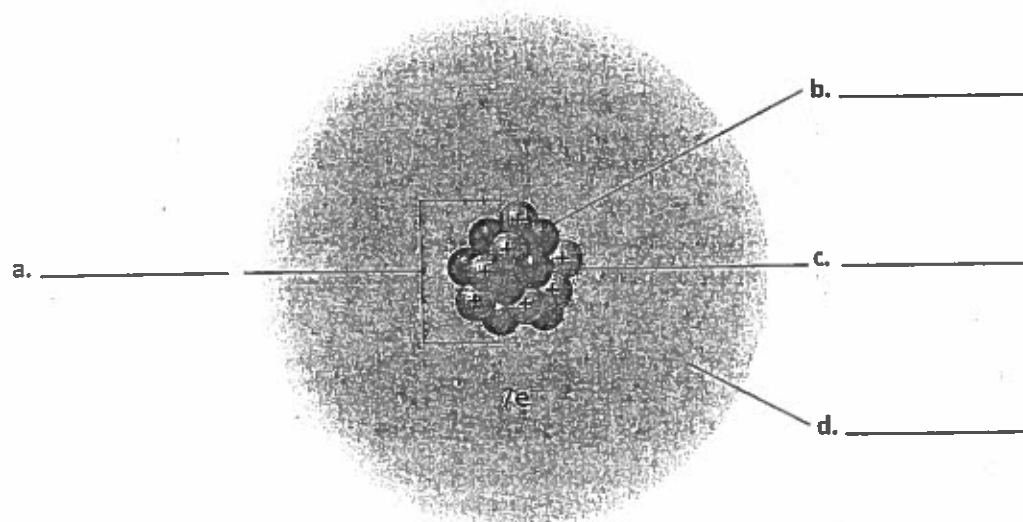
Introduction to Atoms (continued)

7. The atomic model of _____ resembled planets orbiting the sun.
8. What particle did Chadwick discover in 1932 that was hard to detect because it had no electrical charge? _____
9. Is the following sentence true or false? Since the 1930s, the model of the atom has changed a great deal.

10. Circle the letter of each sentence that correctly describes atoms.
 - a. Most of the mass of an atom is due to its protons and neutrons.
 - b. Atoms have no overall electrical charge.
 - c. Atoms of different elements have the same number of protons.
 - d. Most of the volume of an atom consists of its nucleus.

The Modern Atomic Model (pp. 106–108)

11. Label the parts of the atom in the diagram below.



12. Tell why an atom is neutral.

13. Which two particles in an atom have about the same mass?

Name _____ Date _____ Class _____

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13. Which two particles in an atom have about the same mass?

14. How does the mass of an electron compare to the mass of a proton?

15. An element can be identified by the number of _____
in the nucleus of its atoms.

16. What is the atomic number of an element?

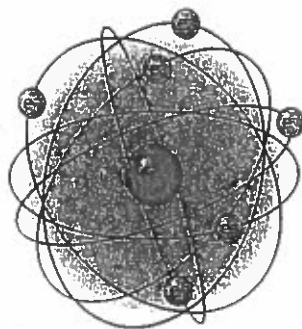
17. What are isotopes?

18. In the space below, draw two isotopes of carbon and give the mass
number for each.

Elements and the Periodic Table ▪ Review and Reinforce

Introduction to Atoms

Label each model of the atom with the name of the scientist who developed it.



1. _____ 2. _____ 3. _____ 4. _____

Building Vocabulary

Match each term with its definition by writing the letter of the correct definition on the line beside the term in the left column.

- | | |
|------------------------|---------------------------------------------------------------------------------------------------------|
| _____ 5. nucleus | a. the sum of protons and neutrons in the nucleus of an atom |
| _____ 6. proton | b. the very small center core of an atom |
| _____ 7. neutron | c. atoms of the same element that differ in the number of neutrons, but have the same number of protons |
| _____ 8. electron | d. the particle of an atom that moves rapidly in the space outside the nucleus |
| _____ 9. atomic number | e. a specific amount of energy related to the movement of electrons in atoms |
| _____ 10. isotopes | f. the particle of an atom with a positive charge |
| _____ 11. mass number | g. the number of protons in the nucleus of every atom of an element |
| _____ 12. energy level | h. the particle of an atom that is neutral |