

Lesson Plan

Section: Substances Are Made of Atoms

Pacing

Regular Schedule	with lab(s): NA	without lab(s): 1 day
Block Schedule	with lab(s): NA	without lab(s): $\frac{1}{2}$ day

Objectives

1. State the three laws that support the existence of atoms.
2. List the five principles of John Dalton's atomic theory.

National Science Education Standards Covered

UNIFYING CONCEPTS AND PROCESSES

UCP 1 Systems, order, and organization

UCP 2 Evidence, models, and explanation

UCP 5 Form and function

PHYSICAL SCIENCE—STRUCTURE OF ATOMS

PS 1a Matter is made of minute particles called atoms, and atoms are composed of even smaller components. These components have measurable properties, such as mass and electrical charge. Each atom has a positively charged nucleus surrounded by negatively charged electrons. The electric force between the nucleus and electrons holds the atom together.

PS 1b The atom's nucleus is composed of protons and neutrons, which are much more massive than electrons. When an element has atoms that differ in the number of neutrons, these atoms are called different isotopes of the element.

TEACHER RESOURCE PAGE

Lesson Plan *continued*

KEY

SE = Student Edition

ATE = Annotated Teacher Edition

Block 1 45 minutes

FOCUS 10 minutes

- _ **Bellringer**, ATE. This activity has students observe a sealed box containing a rattling object. Then they write down their inferences about the object and ways to learn about the object without opening the box.

MOTIVATE 5 minutes

- _ **Discussion**, ATE (GENERAL). This activity asks students for an alternative to the model of matter in which atoms are the building blocks.

TEACH 25 minutes

- _ **Transparency, Law of Conservation of Mass (GENERAL)**. This transparency master shows that the total mass of a system remains the same whether atoms are combined, separated, or rearranged. (Figure 3)
- _ **Transparency, Law of Multiple Proportions (GENERAL)**. This transparency master illustrates the law of multiple proportions using compounds of nitrogen and oxygen. (Table 1)
- _ **Misconception Alert**, ATE (GENERAL). This activity helps students distinguish between the law of multiple proportions and the law of definite proportions. Point out that the law of multiple proportions refers to two or more different compounds containing the same elements.
- _ **Inclusion Strategies**, ATE (GENERAL). This activity helps learning-disabled students and English-language learners practice and demonstrate their learning of the five principles of Dalton's atomic theory.

CLOSE 5 minutes

- _ **Quiz**, ATE (GENERAL). This assignment has students answer questions about the concepts in this lesson.
- _ **Reteaching**, ATE (BASIC). Students create a concept map using the concepts in this section. Reproduce the best concept map on the chalkboard and use it for further discussion.
- _ **Interactive Tutor for ChemFile**, Module 2: Models of the Atom; Topic: □ Atomic Structure
- _ **Assessment Worksheet: Section Quiz** (GENERAL)

HOMEWORK

- _ **Reading Skill Builder**, ATE (BASIC). Have students list things that they already know about matter, atoms, and the particles that make up atoms.
- _ **Homework**, ATE (BASIC). This assignment provides students with a scrambled list of statements that they can match to the five principles of Dalton's atomic theory.
- _ **Section Review**, SE (GENERAL). Assign items 1–9.
- _ **Skills Worksheet: Concept Review** (GENERAL)

OTHER RESOURCES

- _ **History Connection**, ATE (ADVANCED). This activity has students research the work of alchemists and present their findings to the class.
- _ **Activity**, ATE (BASIC). This activity has students relate a beaker of boiling water to the particulate nature of matter.
- _ **go.hrw.com**
- _ **www.scilinks.org**