

Chapter 10 States of Matter

Chapter Opener

__ **Chapter Overview, TE** Review the objectives listed in the Student Edition.

Section 1 The Kinetic-Molecular Theory of Matter

PACING: 45 minutes

PENNSYLVANIA ACADEMIC STANDARDS FOR SCIENCE AND TECHNOLOGY:

3.1.B.1 Distinguish between different types of models and modeling techniques and apply their appropriate use in specific applications;

3.1.C.3 Examine and describe physical patterns in motion;

3.4.A.4 Describe phases of matter according to the Kinetic Molecular Theory;

3.4.B.4 Use knowledge of conservation of energy and momentum to explain common phenomena.

Objectives

1. **State** the kinetic-molecular theory of matter, and describe how it explains certain properties of matter.
2. **List** the five assumptions of the kinetic-molecular theory of gases. Define the terms ideal gas and real gas.
3. **Describe** each of the following characteristic properties of gases: expansion, density, fluidity, compressibility, diffusion, and effusion.
4. **Describe** the conditions under which a real gas deviates from “ideal” behavior.

FOCUS (5 minutes)

__ **Lesson Starter, TE** Open a bottle of perfume or ammonia at the front of the classroom and ask students to raise their hands when they first detect the odor. Ask them to explain the event in terms of molecules.

MOTIVATE (10 minutes)

__ **Discussion, TE** To begin the discussion of the differences between ideal and real gases, have students discuss daily activities in which real and ideal situations exist.

TEACH (20 minutes)

__ **PowerPoint**

__ **Visual Strategy, Figure 1, TE** Have students relate the assumptions of the kinetic-molecular theory of gases to this figure.

__ **Visual Strategy, Figure 3, TE** Ask students to infer what will happen if the pressure on the gas continues to increase.