UNIT 2

Chemical Quantities

UNIT 2 CONTENTS

UNIT 2 OVERALL EXPECTATIONS

- What is the mole? Why is it important for analyzing chemical systems?
- How are the quantitative relationships in balanced chemical reactions used for experiments and calculations?
- Why are quantitative chemical relationships important in the home and in industries?

Unit Investigation Prep

Read pages 274–275 before beginning this unit. There, you will have the opportunity to determine the composition of a mixture. You can start planning your investigation well in advance by knowing the kind of skills and information you need to have as you progress through Unit 2.

In the 1939 film *The Wizard of Oz*, Dorothy and her companions collapsed in sleep in a field of poppies. This scene is not realistic, however. Simply walking in a field of poppies will not put you into a drugged sleep.

Poppy seeds do, however, contain a substance called opium. Opium contains the drugs morphine, codeine, and heroin, collectively known as opiates.

While you are unlikely to experience any physiological effects from eating the poppy seeds on a bagel, they could cost you your job! For some safety sensitive jobs, such as nursing and truck-driving, you may be required to take a drug test as part of the interview process.

Each gram of poppy seeds may contain 2 mg to 18 mg of morphine and 0.6 mg to 2.4 mg of codeine. Eating foods with large amounts of poppy seeds can cause chemists to detect opiates in urine. The opiates may be at levels above employers' specified limits.

Knowing about quantities in chemical reactions is crucial to interpreting the results of drug tests. Policy-makers and chemists need to understand how the proportions of codeine to morphine caused by eating poppy seeds differ from the proportions caused by taking opiates.

In this unit, you will carry out experiments and calculations based on the quantitative relationships in chemical formulas and reactions.