





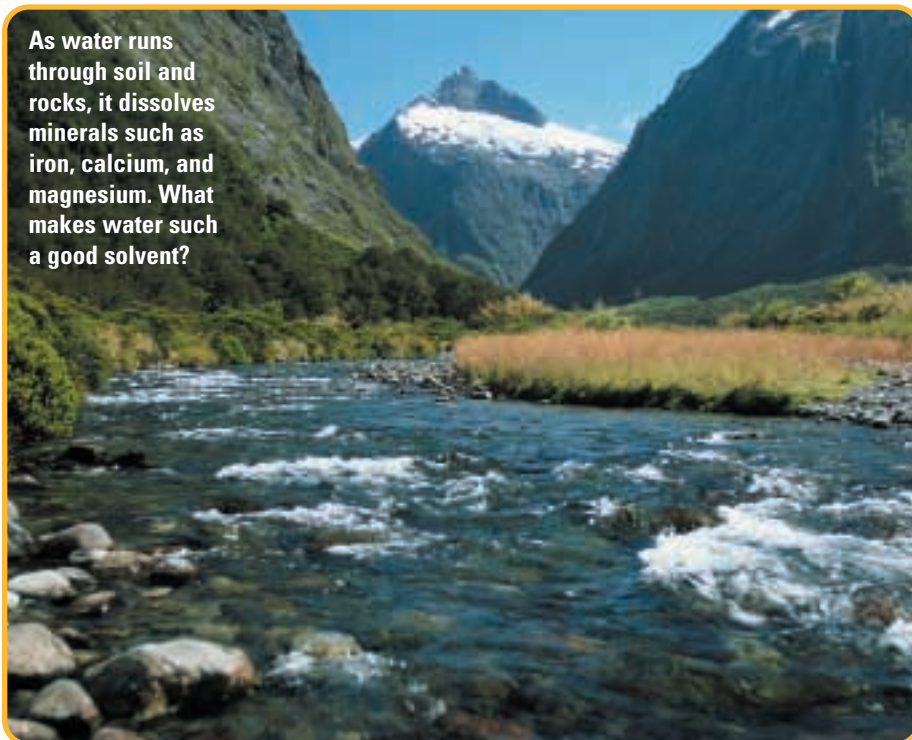
# Solutions and Their Concentrations

**Y**our environment is made up of many important solutions, or homogeneous mixtures. The air you breathe and the liquids you drink are solutions. So are many of the metallic objects that you use every day. The quality of a solution, such as tap water, depends on the substances that are dissolved in it. “Clean” water may contain small amounts of dissolved substances, such as iron and chlorine. “Dirty” water may have dangerous chemicals dissolved in it.

The difference between clean water and undrinkable water often depends on concentration: the amount of a dissolved substance in a particular quantity of a solution. For example, tap water contains a low concentration of fluoride to help keep your teeth healthy. Water with a high concentration of fluoride, however, could be harmful to your health.

Water is a good solvent for many substances. You may have noticed, however, that grease-stained clothing cannot be cleaned by water alone. Grease is one substance that does not dissolve in water. Why doesn't it dissolve? In this chapter, you will find out why. You will learn how solutions form. You will explore factors that affect a substance's ability to dissolve. You will find out more about the concentration of solutions, and you will have a chance to prepare your own solutions as well.

As water runs through soil and rocks, it dissolves minerals such as iron, calcium, and magnesium. What makes water such a good solvent?



## Chapter Preview

- 8.1** Types of Solutions
- 8.2** Factors That Affect Rate of Dissolving and Solubility
- 8.3** The Concentration of Solutions
- 8.4** Preparing Solutions

## Concepts and Skills You Will Need

Before you begin this chapter, review the following concepts and skills:

- classifying mixtures (Chapter 1, section 1.3)
- predicting molecular polarity (Chapter 3, section 3.3)
- distinguishing between intermolecular and intramolecular forces (Chapter 3, section 3.2)
- describing the shape and bonding of the water molecule (Chapter 3, section 3.3)
- calculating molar mass (Chapter 5, section 5.3)
- calculating molar amounts (Chapter 5, section 5.3)