

# UNIT 3

## Solutions and Solubility

### UNIT 3 CONTENTS

#### CHAPTER 8

Solutions and Their Concentrations

#### CHAPTER 9

Aqueous Solutions

#### CHAPTER 10

Acids and Bases

#### UNIT 3 ISSUE

Island at Risk

### UNIT 3 OVERALL EXPECTATIONS

- What are the properties of solutions, and what methods are used to describe their concentrations?
- What skills are involved in working experimentally with solutions, and in solving quantitative solution problems?
- How can a scientific understanding of solutions help us interpret and make decisions about environmental issues involving solutes and solvents?

#### Unit Issue Prep

Look ahead to the issue at the end of Unit 3. Start preparing for this issue now by listing the kinds of questions you will need to address, and the ways in which you may like to present your responses.

**K**eeping fish as pets seems like a simple and straightforward task. You start off with a suitable fish tank, some water, and some fish. Once you have added a few water-plants for decoration, all you have to do is feed the fish daily. It sounds simple.

In fact, providing a safe, life-sustaining environment for fish involves a variety of complex, interdependent factors. Many of these are directly related to chemistry. For example, the presence of ammonia,  $\text{NH}_3$ , is one of the most common causes of death in poorly maintained fish tanks. Ammonia is produced when uneaten fish food decays. This compound dissolves readily in water. It is toxic to fish in even minute concentrations.

Chlorine is another chemical that can harm fish when it is dissolved in the tank water. Unfortunately, almost all tap water is treated with chlorine. Other factors that affect the quality of water for fish include its acidity (pH), its hardness, and its temperature. For example, warm water contains too little dissolved oxygen. This will cause the fish to suffocate.

Water quality is essential to every living thing. In this unit, you will find out more about water quality. You will learn to identify important solutions in your life, and how to calculate their concentrations. You will also investigate what can happen when acids and bases interact with water and with each other.



