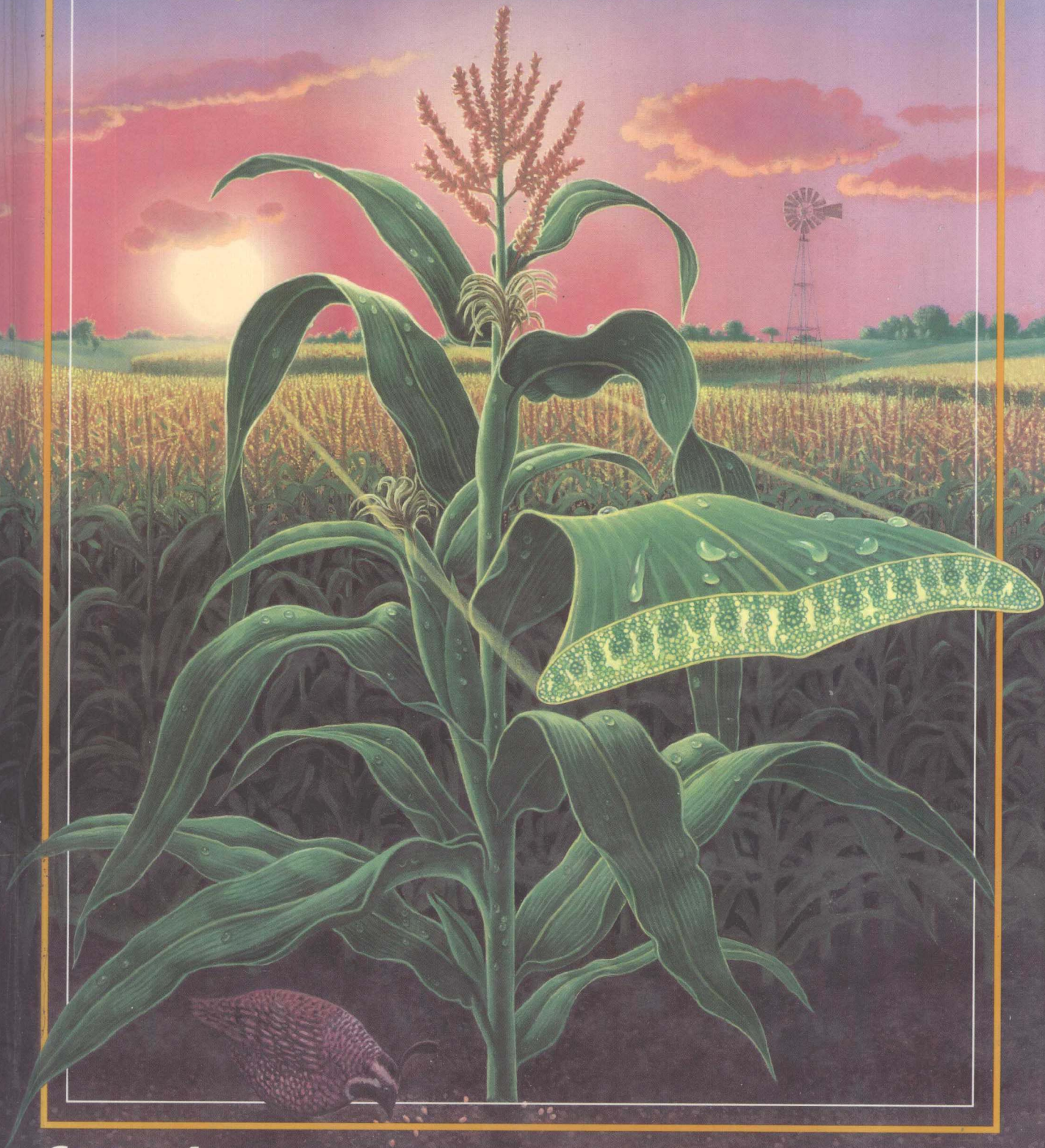
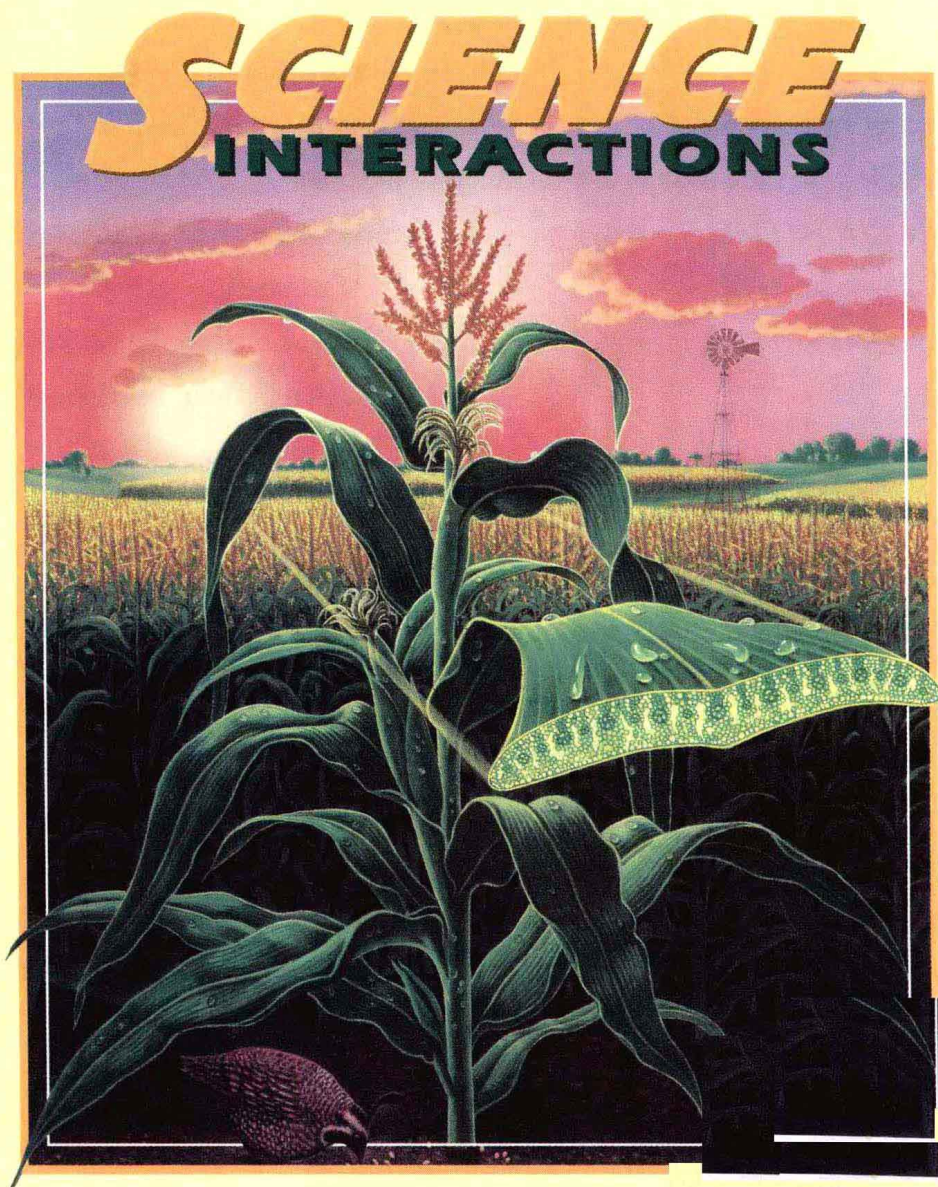


SCIENCE

INTERACTIONS



Course 1



Course 1

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Introducing Science Interactions

What do you really know about yourself and your surroundings? Trying to make sense of the world is something that we struggle with from the very beginnings of our lives. Through our senses, we begin the process of gathering and sorting information, so that we can understand the world around us and our place in it. As you study Science Interactions, Course One, you'll use your senses to observe some everyday things and then collect and analyze your observations.

Mirror, Mirror, on the wall ...

Consider this problem. You want to buy a full-length mirror for your room to use as you get dressed each day. How tall does the mirror have to be for you to see your whole body from the top of your head to your feet?

Does it have to be as tall as you? Do you have to stand in a certain place? If you stand further away, does the mirror have to be as tall? You can answer these questions yourself by looking at a mirror and finding out. Try it.

When you looked at yourself in a full length mirror and moved back and forth, what did you notice? Were you surprised that the mirror needed to be only half as tall as yourself? When you moved backward away from the mirror, what did you discover? You saw that it made no difference how close or how far away you were. The mirror could be the same height regardless of where you stood. This is an example of how observations can help you answer a question and make a decision. It also shows how our common ideas or beliefs are sometimes not correct. You are going to learn that there is a rather simple law in science that tells why you need a mirror only half your height to see yourself full-length.



Did you ever wonder how your ears, eyes, and nose help your brain gather information? In Science Interactions, you will use your senses to observe such things as the sun and moon in Chapter 1, plants and animals in Chapters 10 and 11, and in Chapter 18, waves. And, you'll learn how your senses work in Chapter 4. Hopefully, you'll never again take your senses for granted! Let's look at another example where you must do more than just observe what your senses seem to be telling you.

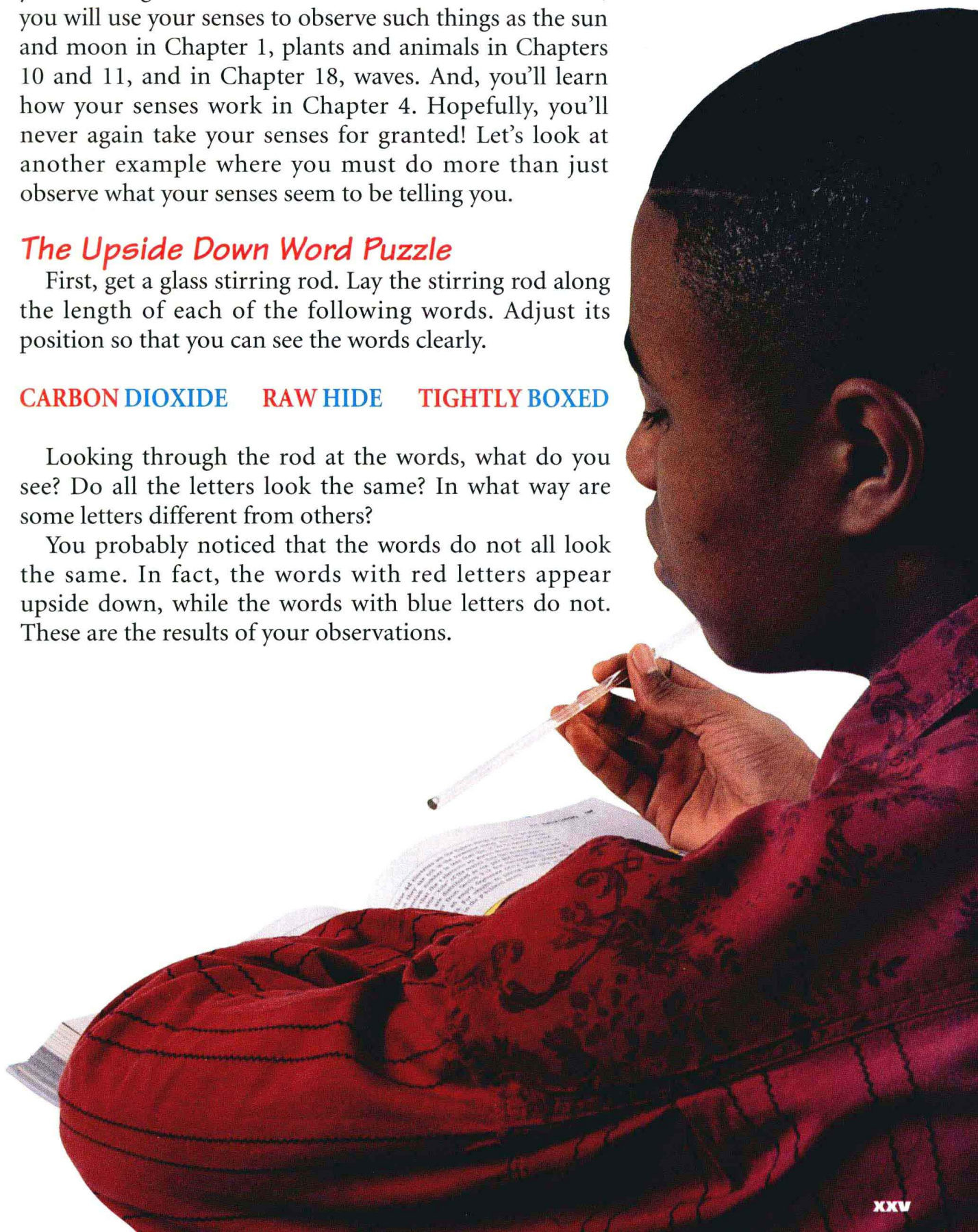
The Upside Down Word Puzzle

First, get a glass stirring rod. Lay the stirring rod along the length of each of the following words. Adjust its position so that you can see the words clearly.

CARBON **DIOXIDE** **RAW** **HIDE** **TIGHTLY** **BOXED**

Looking through the rod at the words, what do you see? Do all the letters look the same? In what way are some letters different from others?

You probably noticed that the words do not all look the same. In fact, the words with red letters appear upside down, while the words with blue letters do not. These are the results of your observations.



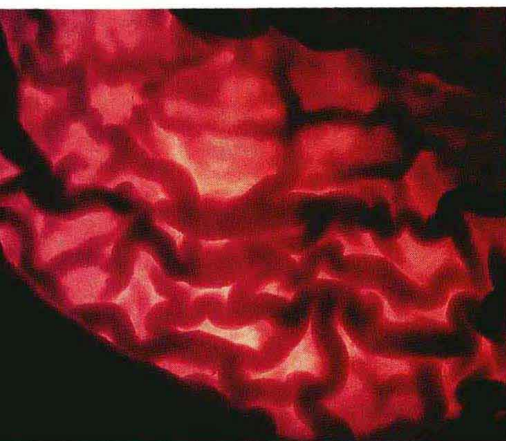
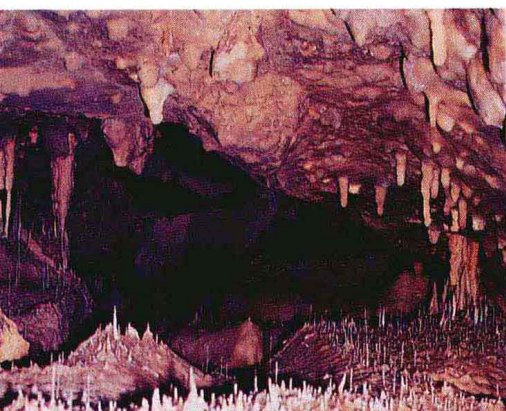
FIND OUT!

How can you solve the upside-down puzzle?

Do you see any pattern in the results? Can you make up an explanation for these results? Design an experiment that would test your explanation. For example, maybe you think that the color of the words affects whether the words appeared upside down or not. How could you test this? Find words in your book printed in different colors. Use your rod and see how these words appear. Do only red words turn upside down? What about other colors? Do black words invert?

The results of this experiment will either agree with your explanation or won't agree. If the results are not in agreement, then you may need to make other observations, and perform further experiments to test your new observations. Make a new explanation and test it.

Acids help form caves in Earth and digest food in your stomach.

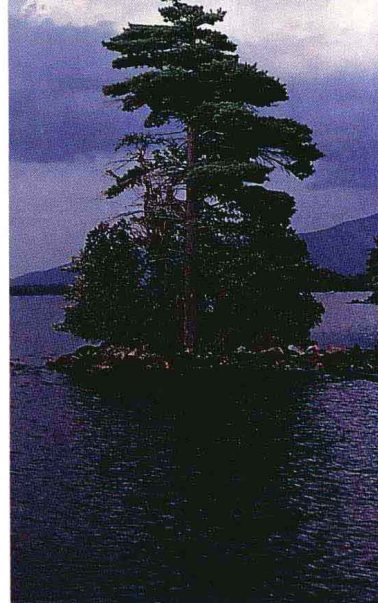


As you just saw, as much as we trust our senses, they often deceive us. Like you, scientists sometimes find that observations that they've made are not complete. Sometimes observations are measured. It is important to make careful and precise observations.

Solving the upside-down word puzzle involved discovering a pattern and figuring out relationships. As you make observations during the activities in Science Interactions and as you read the text, you will learn about each topic from several perspectives. For example, you could memorize a definition that says an acid is a compound that contains hydrogen, tastes sour, and is corrosive. But if you study about acids and perform tests that help you find out the properties of acids in several different settings, you will have a better understanding of what an acid is. In Chapter 8, you'll discover how the structure of an acid is related to the way it acts on living and non-living things. In Chapter 16, you'll discover a connection to Earth science when you see how acids affect rocks to help produce soil. And in a Science and Society lesson on acid rain, you'll learn that acids may have a much larger impact on a global scale.

By studying topics such as acids from the different perspectives of chemistry, Earth science, life science, and physics, you'll have a better, more complete idea of what an acid is. You will also see that, in many instances, you are already more familiar with the topic than you may have thought you were.

Science can help you find answers to all the marvelous, puzzling things you may have observed or wondered about. And as you complete the activities and study the chapters of this text, two things will happen for you. First, you will learn how to make observations that will lead you to gather useful scientific information. This skill will help you begin to make sense of the world. Second, you will begin to see and appreciate the patterns, the structure, and the amazing order of Earth.



Although they may look healthy, many lakes in the northeast have been affected by acid rain.



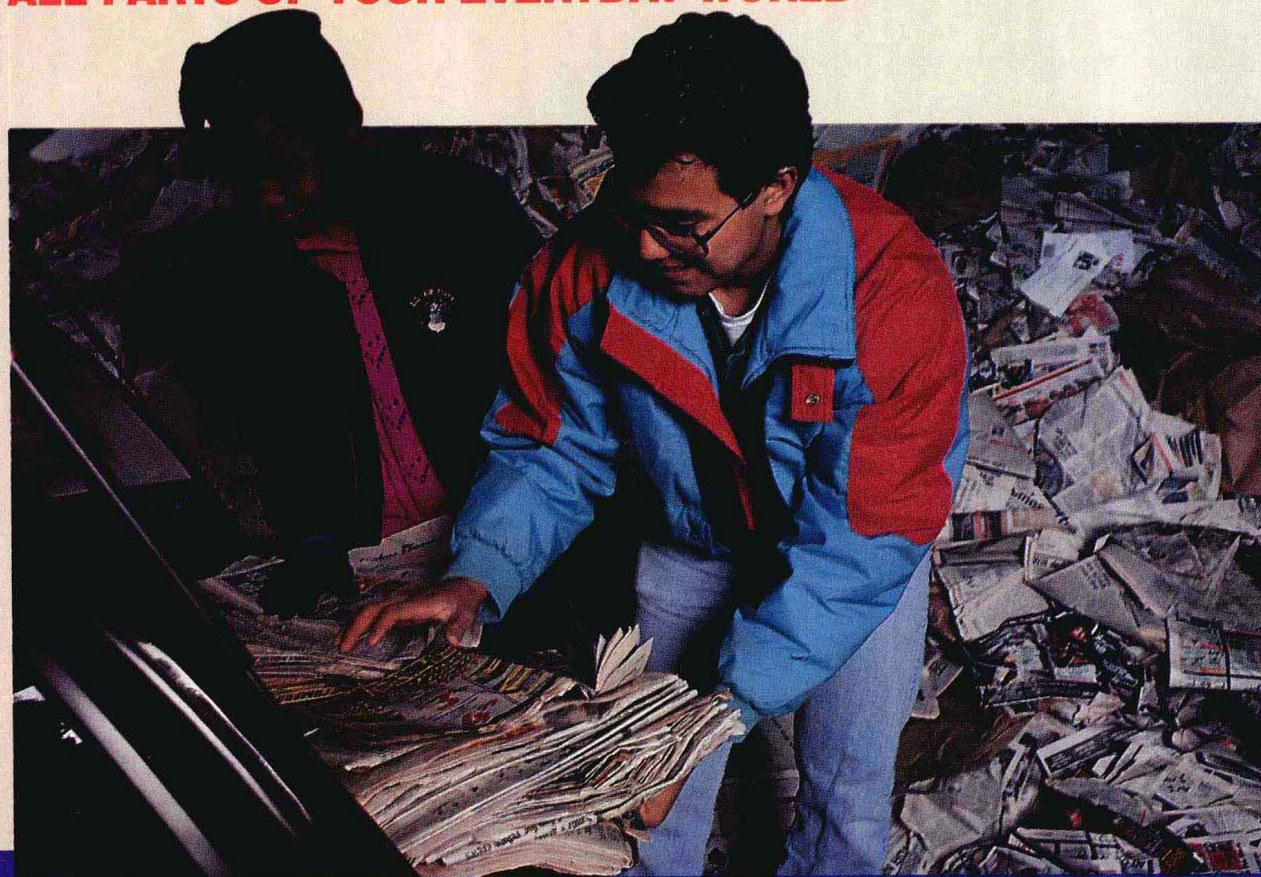
Fog over the Golden Gate Bridge, San Francisco

EXPERIENCE SCIENCE

**HAVE FUN
WHILE YOU
LEARN SCIENCE**



**IN THE “EXPANDING YOUR VIEW” FEATURES,
YOU’LL EXPLORE HOW SCIENCE CONNECTS TO
ALL PARTS OF YOUR EVERYDAY WORLD**



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Yogi Berra, the great New York Yankee catcher, once said, “You can observe a lot by just watching.” One of the things we do most often is observe where we are, what’s around us, and how things seem to work. It’s a very important part of the learning process, and this unit gets us started.

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Getting lost is easy. Knowing where we are is harder. What would you do if you got lost outside? Learning to observe your surroundings on Earth and in the sky could help.

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