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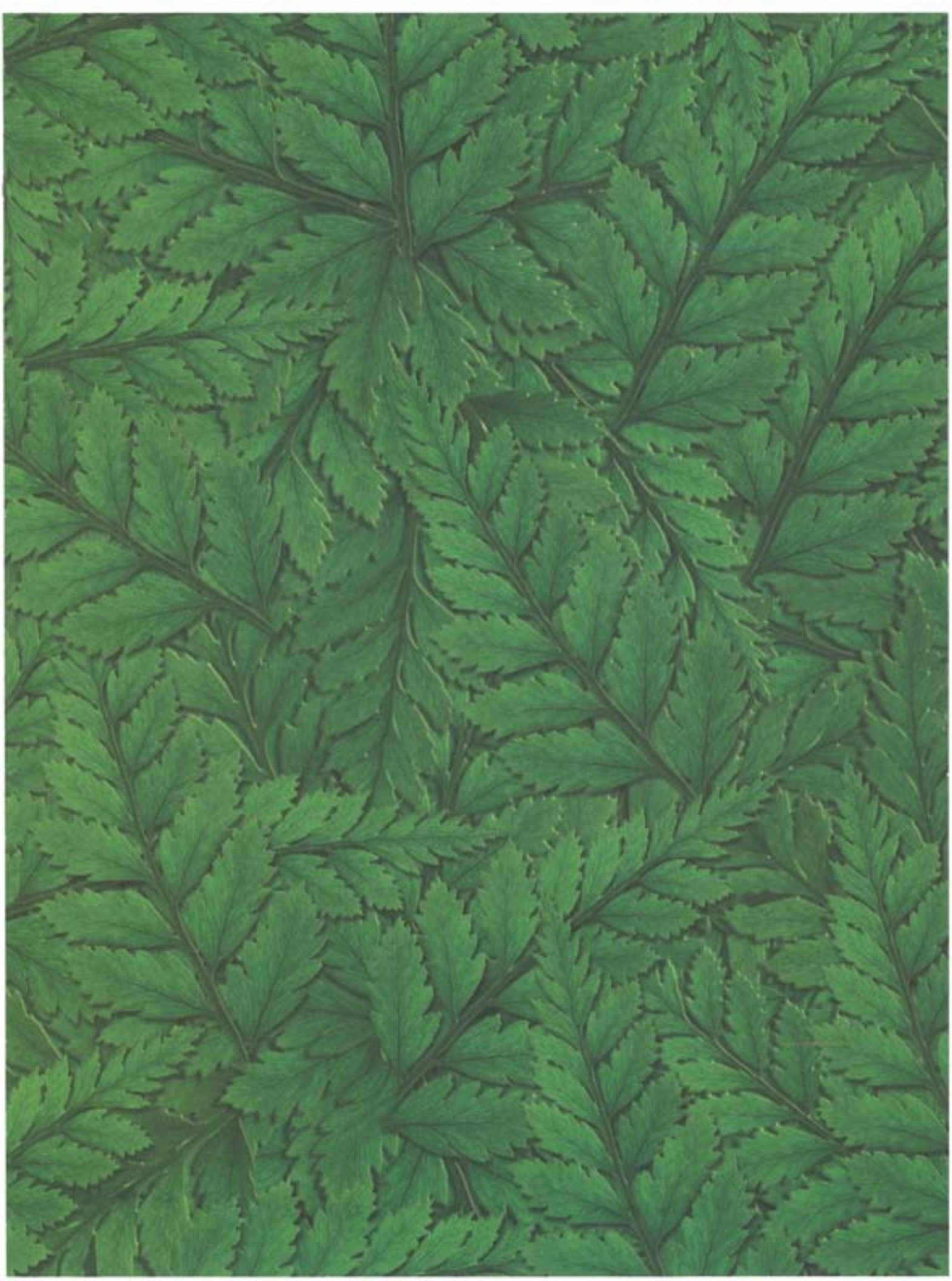

Jackson's Chameleon

MACMILLAN
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Science

Lucy H. Daniel
Jay Hackett
Richard H. Moyer
JoAnne Vasquez

About the Cover

Chameleons are known as the masters of camouflage. They have the ability to change their skin color and patterns. Chameleons are slow-moving animals so they rely on protective coloration for defense. For protection, a chameleon might show bright colors, which often means "bad-tasting" or "poison" to predators. If this doesn't work, they may shift to a dull color and play dead.

INQUIRY **What else would you like to know about chameleons? Write your own question or questions to answer.**

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RFB&D
learning through listening

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Letter from Sally Ride

When I put on my helmet and climbed into the space shuttle I knew I was in for the adventure of a lifetime. That trip into space was a dream come true. The dream began when I was in elementary school. And studying science made it possible! I've always been interested in science. In the fifth grade, I made a mobile of the planets for a class project. Even then I wondered what it would be like to explore Mars.

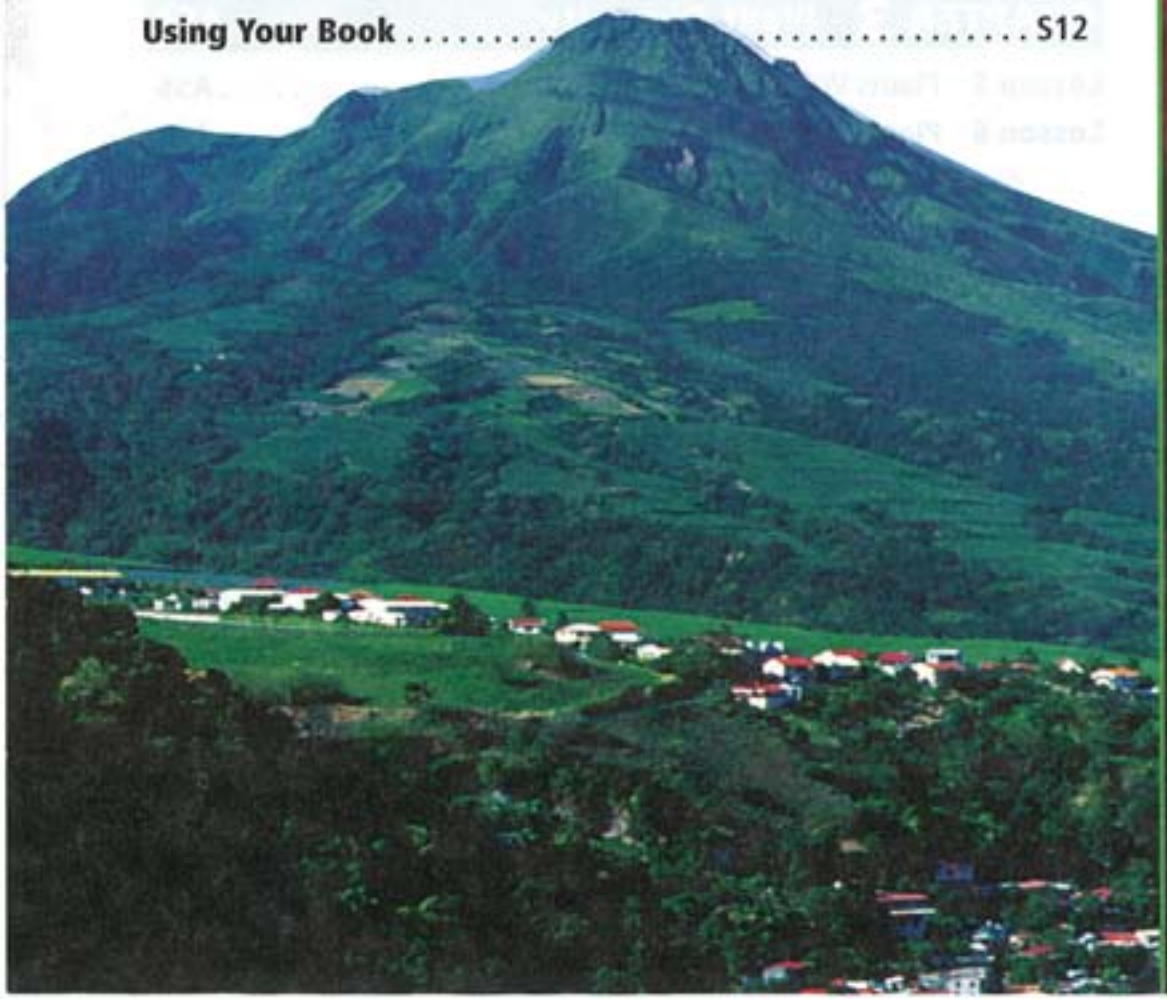
Neither of my parents were scientists, but that didn't matter. They encouraged me to read books and to explore the things that interested me. And they encouraged me to be curious, to ask questions, and to think about things for myself. All of these things helped me become a scientist and an astronaut.

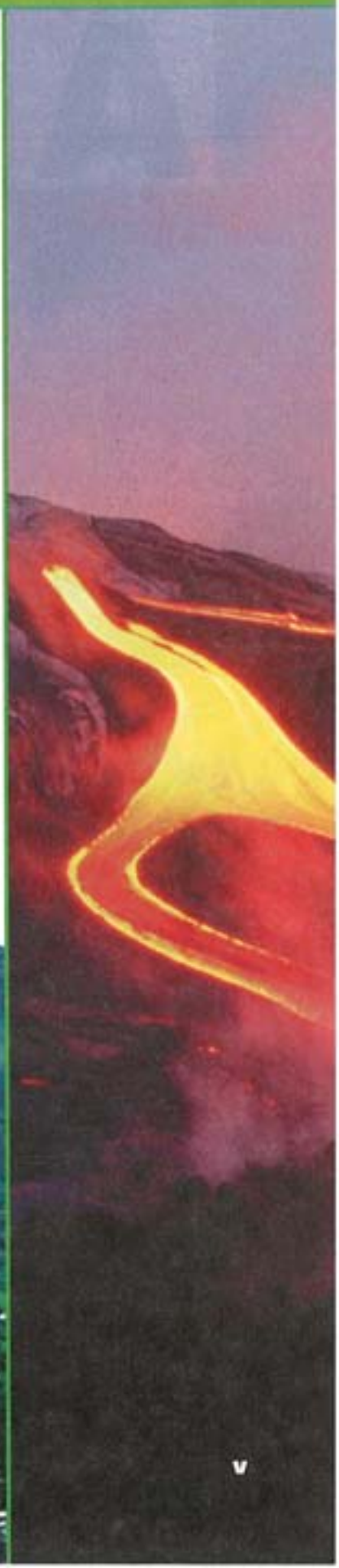
Maybe some of you have dreams like mine. Maybe you dream of exploring Mars one day. Whatever you dream of doing, it will help you to have the skills of a scientist—ask questions and explore things for yourself! And always

Reach for the stars!

Sally K. Ride

Be a Scientist! PAGE S1





UNIT A

Life Science

Characteristics of Living Things PAGE A1

UNIT B

Life Science

Living Things and Their Environments PAGE B1

UNIT C

Earth Science

Earth and Its Resources PAGE C1

UNIT D

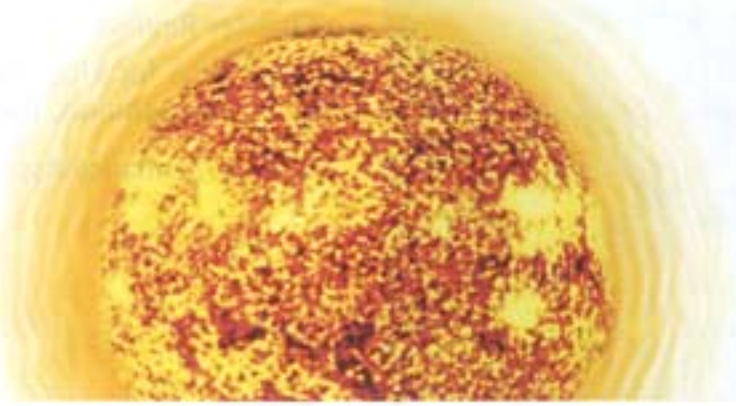
Earth Science

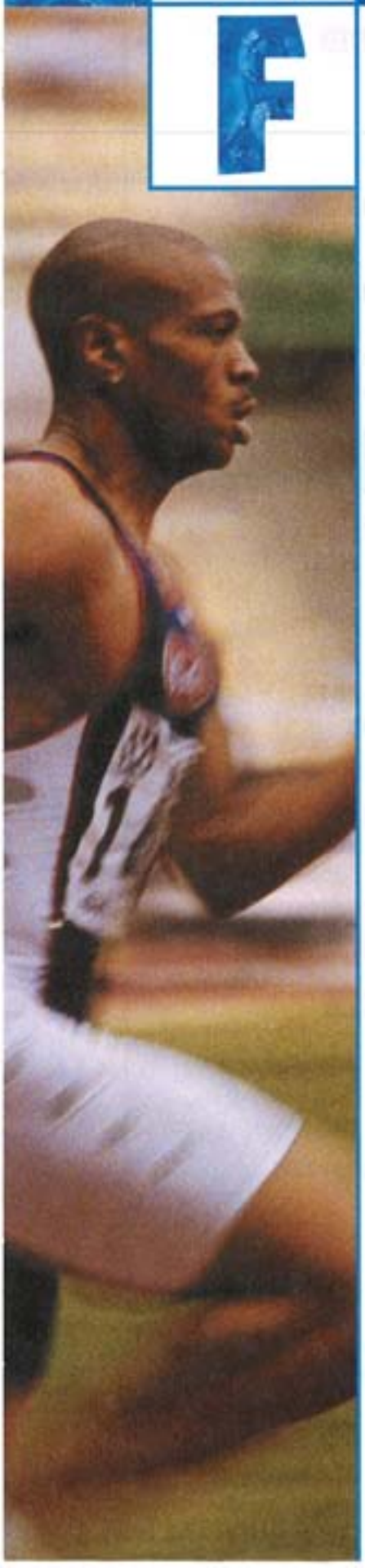
Astronomy, Weather, and Climate PAGE D1

UNIT E

Physical Science

Properties of Matter and Energy PAGE E1





UNIT F

Physical Science

Motion and Energy PAGE F1

Activities

UNIT A

Explore Activities

Quick Labs with FOLDABLES

Inquiry Skill Builders

UNIT B

Explore Activities

Quick Labs with FOLDABLES

Inquiry Skill Builders

UNIT C

Explore Activities

Quick Labs with FOLDABLES

Inquiry Skill Builders

UNIT D

Explore Activities

Quick Labs with FOLDABLES

Inquiry Skill Builders

UNIT E

Explore Activities

Quick Labs with FOLDABLES

Inquiry Skill Builders

UNIT F

Explore Activities

Quick Labs with FOLDABLES

Inquiry Skill Builders

Science Handbook

Health Handbook

FOLDABLES™

by Dinah Zike

Using Foldables for Data Collection

A Foldables organizer is a 3-D, interactive graphic organizer. It can be a valuable learning tool to help you organize, review, and remember information. You will find suggestions for using Foldables organizers to help you collect and record data in Quick Lab activities throughout this book.

Basic Shapes

The figures on this page illustrate the basic folds that are the building blocks for all Foldables organizers used in the Quick Labs. The basic folds have friendly names, such as "hot dog fold," so that you can easily visualize and remember what they look like. Step-by-step folding instructions for each type of Foldables organizer used in the Quick Labs are given on pages R41–R44.

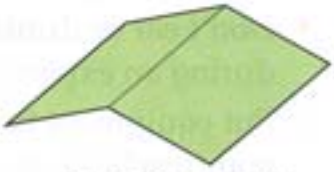
Basic Shapes

Hot Dog Fold

Shutter Fold

Hamburger Fold

Valley Fold



Mountain Fold

Science Safety Tips

In the Classroom

- Read all directions. Make sure you understand them. When you see BE CAREFUL!, be sure to follow the safety rule.
- Listen to your teacher for special safety directions. If you don't understand something, ask for help.
- Wash your hands with soap and water before an activity.
- Be careful around a hot plate. Know when it is on and when it is off. Remember that the plate stays hot for a few minutes after it's turned off.
- Wear a safety apron if you work with anything messy or anything that might spill.
- Wipe up a spill right away or ask your teacher for help.
- Tell your teacher if something breaks. If glass breaks, do not clean it up yourself.
- Keep your hair and clothes away from open flames. Tie back long hair, and roll up long sleeves.
- Keep your hands dry around electrical equipment.
- Don't eat or drink anything during an experiment.
- Put equipment back the way your teacher tells you.
- Dispose of things the way your teacher tells you.
- Wear safety goggles when your teacher tells you to wear them. Wear them when working with anything that can fly into your eyes or when working with liquids.
- Clean up your work area after an activity and wash your hands with soap and water.

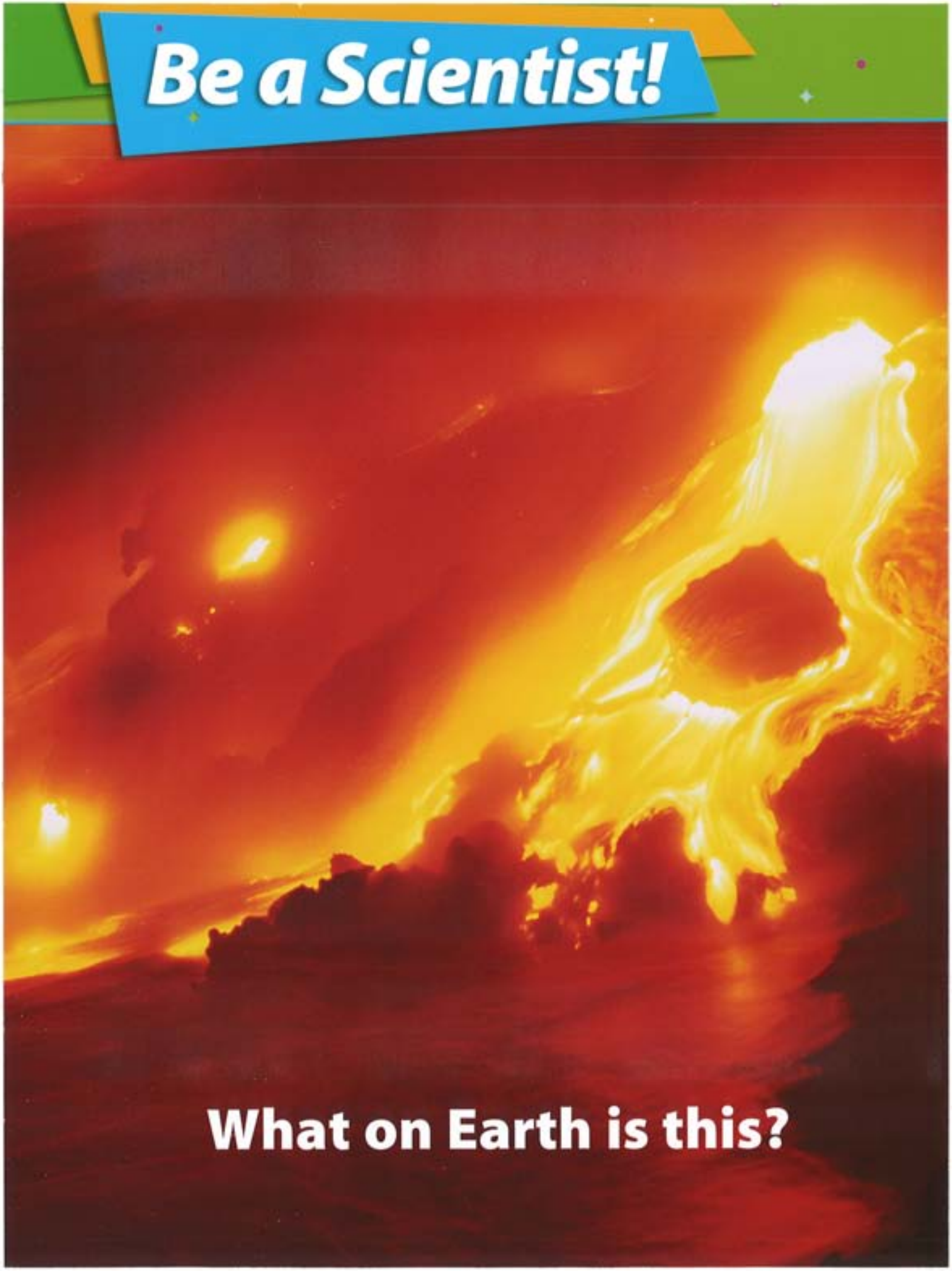
In the Field

- Go with a trusted adult—such as your teacher or a parent or guardian.
- Do not touch animals or plants without an adult's approval. The animal might bite. The plant might be poison ivy or another dangerous plant.

Responsibility

- Treat living things, the environment, and one another with respect.

Be a Scientist!

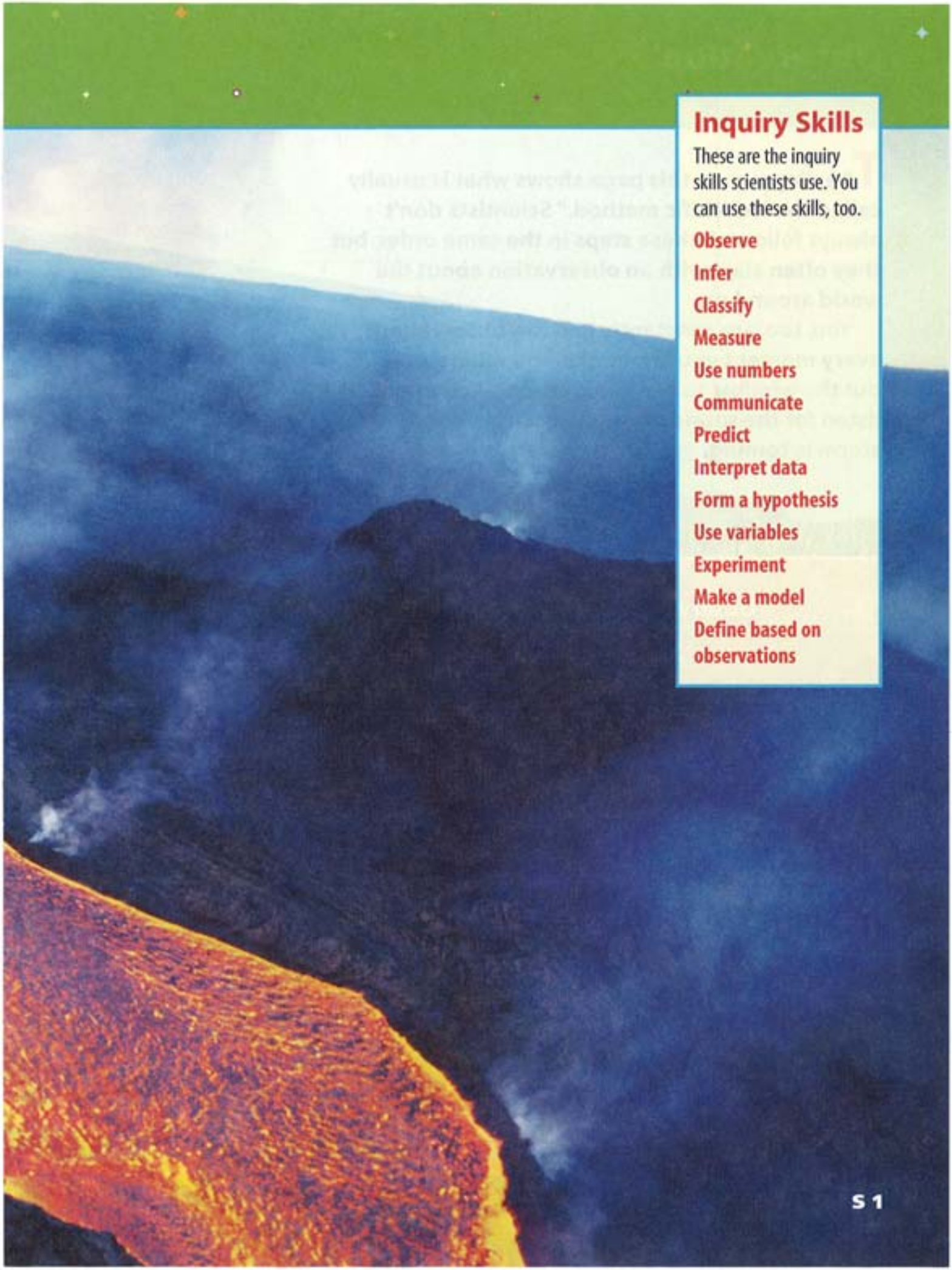


What on Earth is this?

Volcano!

Science is a way of understanding the world around us. The work of scientists often begins when scientists ask questions about something they observe. Asking and answering questions is the basis of inquiry.

In this section, you will see how scientists use inquiry skills, visual literacy, reading skills, technology and information literacy, math skills, and writing skills as they study volcanoes.



Inquiry Skills

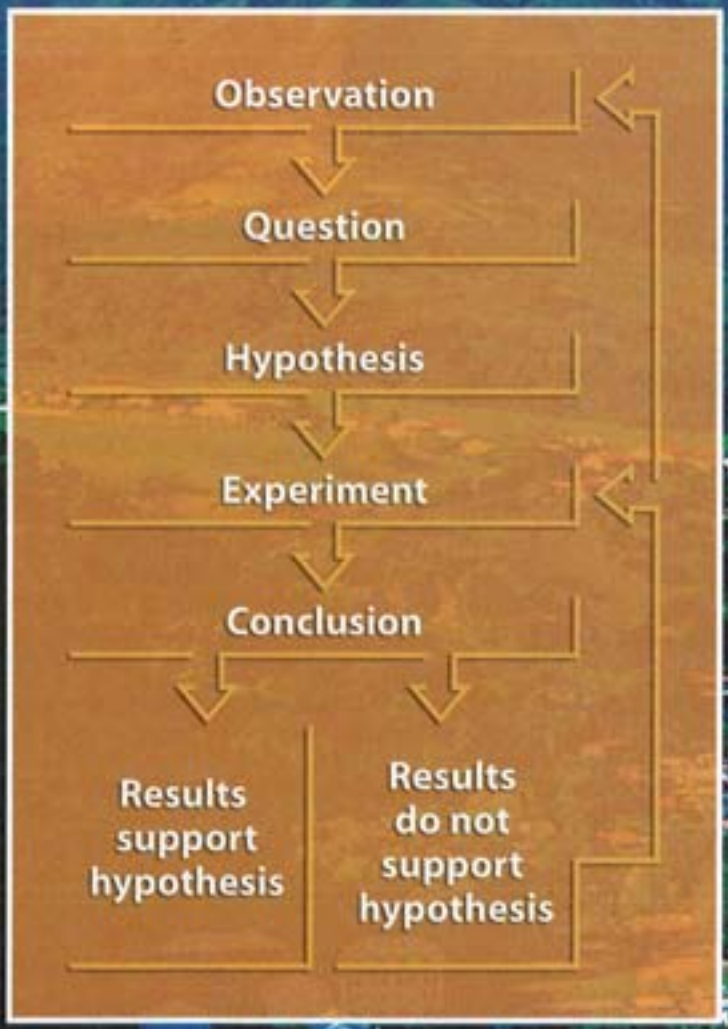
These are the inquiry skills scientists use. You can use these skills, too.

- Observe
- Infer
- Classify
- Measure
- Use numbers
- Communicate
- Predict
- Interpret data
- Form a hypothesis
- Use variables
- Experiment
- Make a model
- Define based on observations

Observation > Question and Hypothesis >

The diagram on this page shows what is usually called the "scientific method." Scientists don't always follow all these steps in the same order, but they often start with an observation about the world around us.

You, too, are constantly making observations every moment you are awake. You might look out the window to see if it is raining. You might listen for the sound of thunder to find out if a storm is coming.



Inquiry Skills

When you make observations, you use these skills.

Observe Use your senses to learn about an object or event.

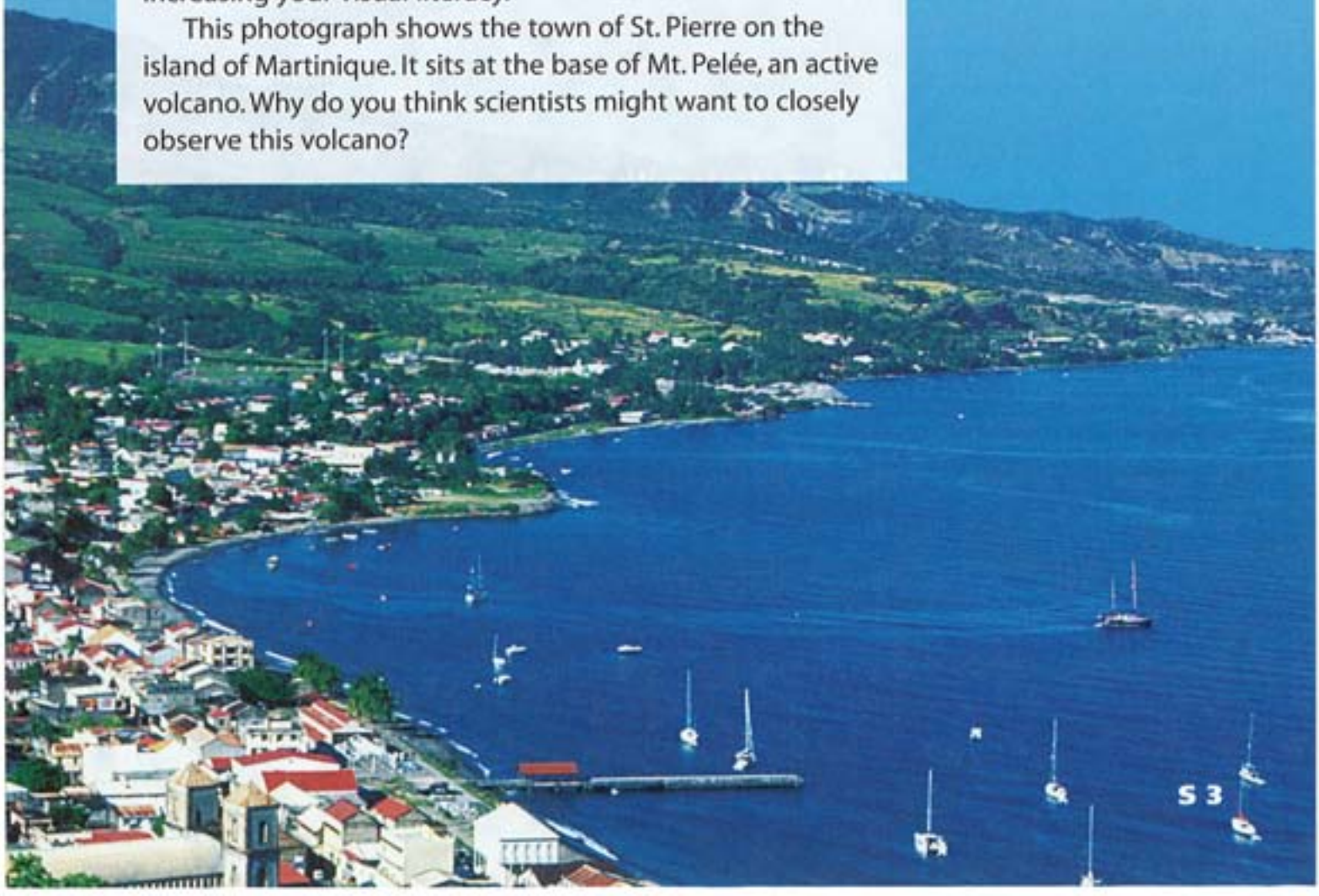
Classify Place things that share properties together in groups.

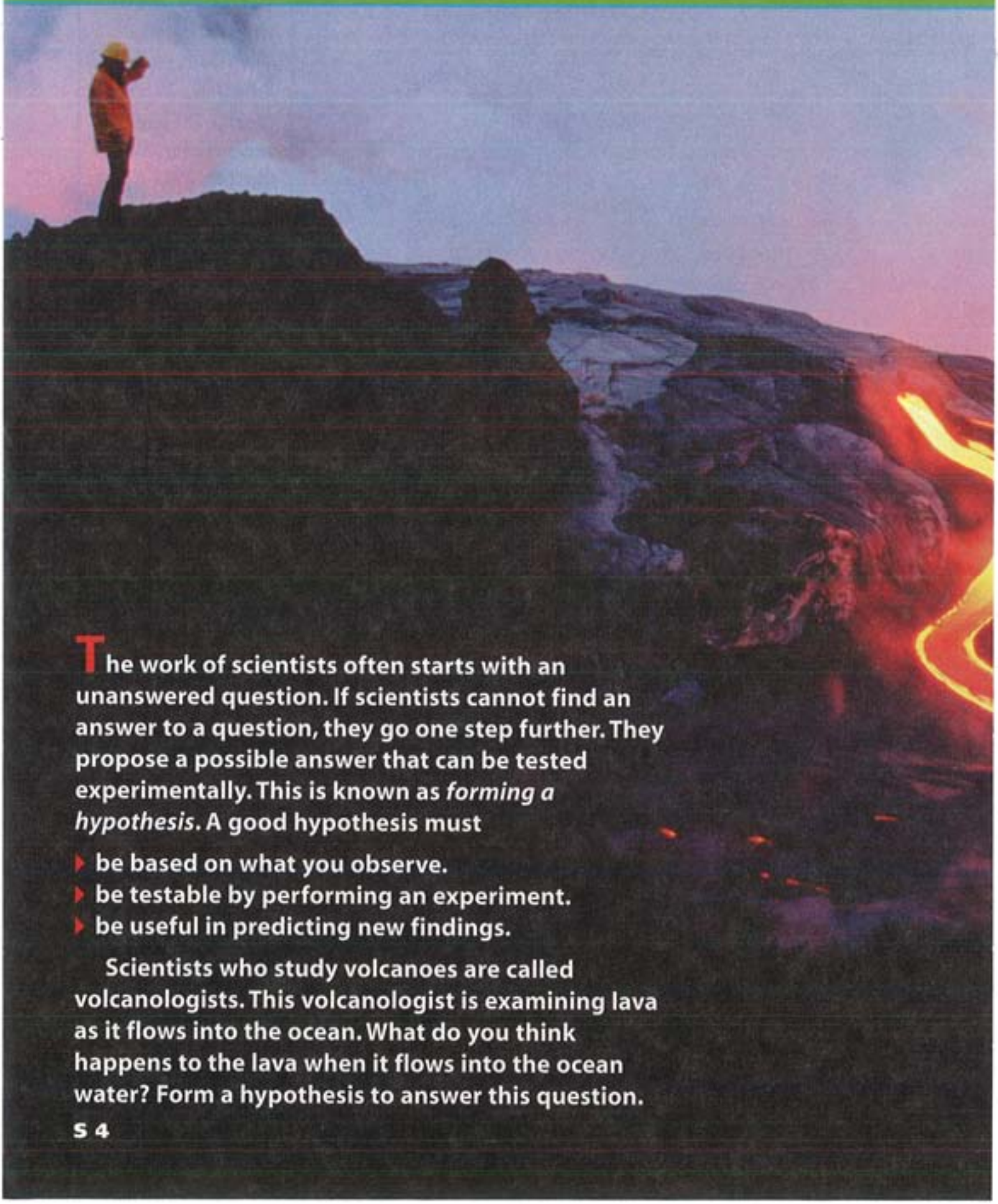
Measure Find the size, distance, time, volume, area, mass, weight, or temperature of an object or an event.

Visual Literacy

More than half the information you get comes from pictures, or visuals. Pictures, maps, graphs, charts, and diagrams are tools. When you use them to improve your observation skills and to understand what you read, you are increasing your visual literacy.

This photograph shows the town of St. Pierre on the island of Martinique. It sits at the base of Mt. Pelée, an active volcano. Why do you think scientists might want to closely observe this volcano?





The work of scientists often starts with an unanswered question. If scientists cannot find an answer to a question, they go one step further. They propose a possible answer that can be tested experimentally. This is known as *forming a hypothesis*. A good hypothesis must

- be based on what you observe.
- be testable by performing an experiment.
- be useful in predicting new findings.

Scientists who study volcanoes are called volcanologists. This volcanologist is examining lava as it flows into the ocean. What do you think happens to the lava when it flows into the ocean water? Form a hypothesis to answer this question.

Reading in Science

Before doing an experiment to answer a question, scientists often read to try to find the answer or to find what others have learned from their experiments. You can use these reading strategies and skills to help you understand science. While you read, ask yourself these questions:

- **Compare and Contrast** How are two things alike? How are they different?
- **Main Idea and Supporting Details** What is the paragraph about? Which details add more information?
- **Predict** What do you think will happen next?
- **Cause and Effect** Why did something happen? (This is the cause.) What happened as a result? (This is the effect.)
- **Draw Conclusions** What do I know from the evidence?
- **Sequence of Events** What happened first, next, and last?
- **Summarize** What is this lesson or paragraph about?

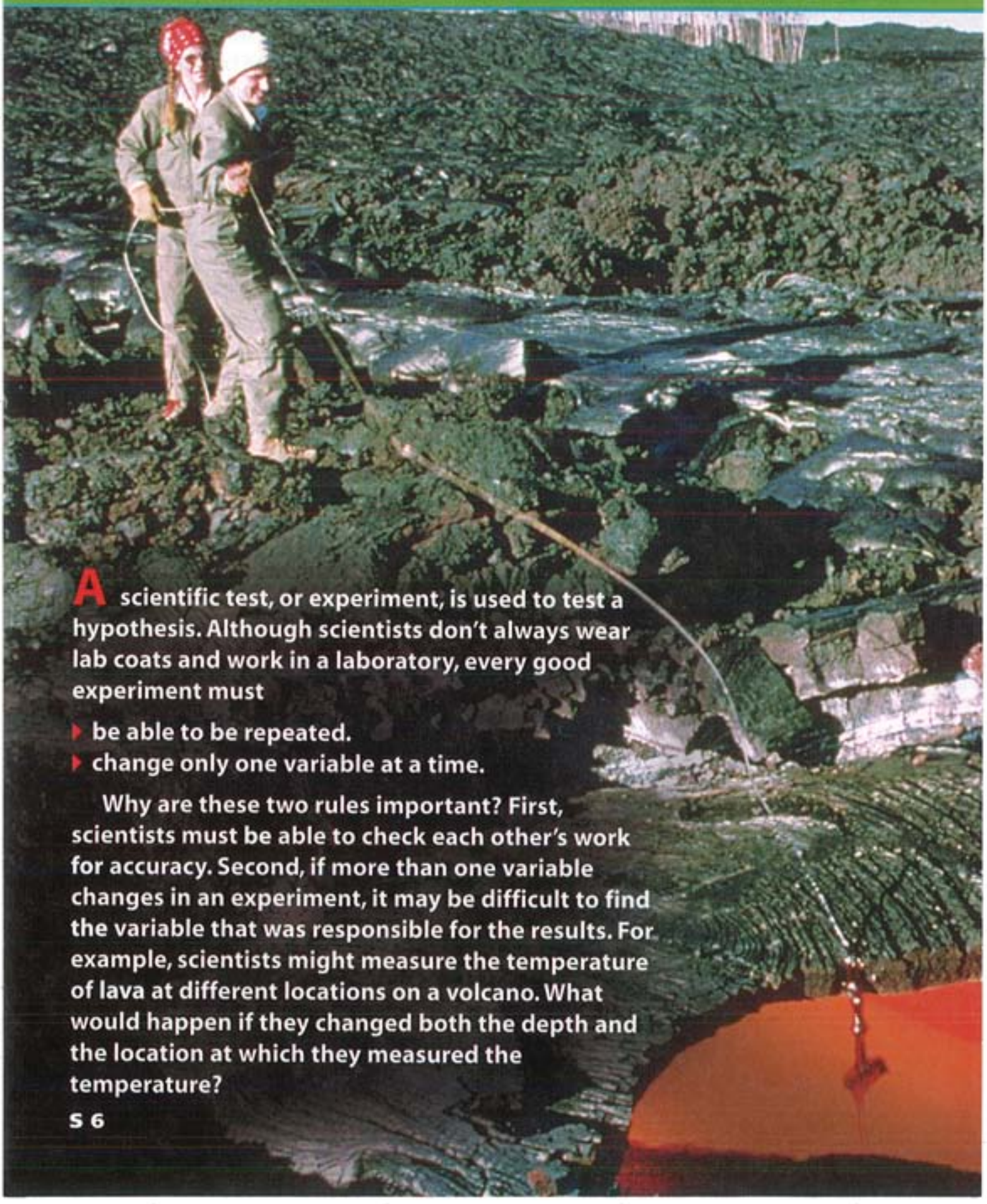
Inquiry Skills

When you ask questions and form hypotheses, you use these skills.

Infer Form an idea from facts or observations.

Form a hypothesis Make a statement that can be tested to answer a question.

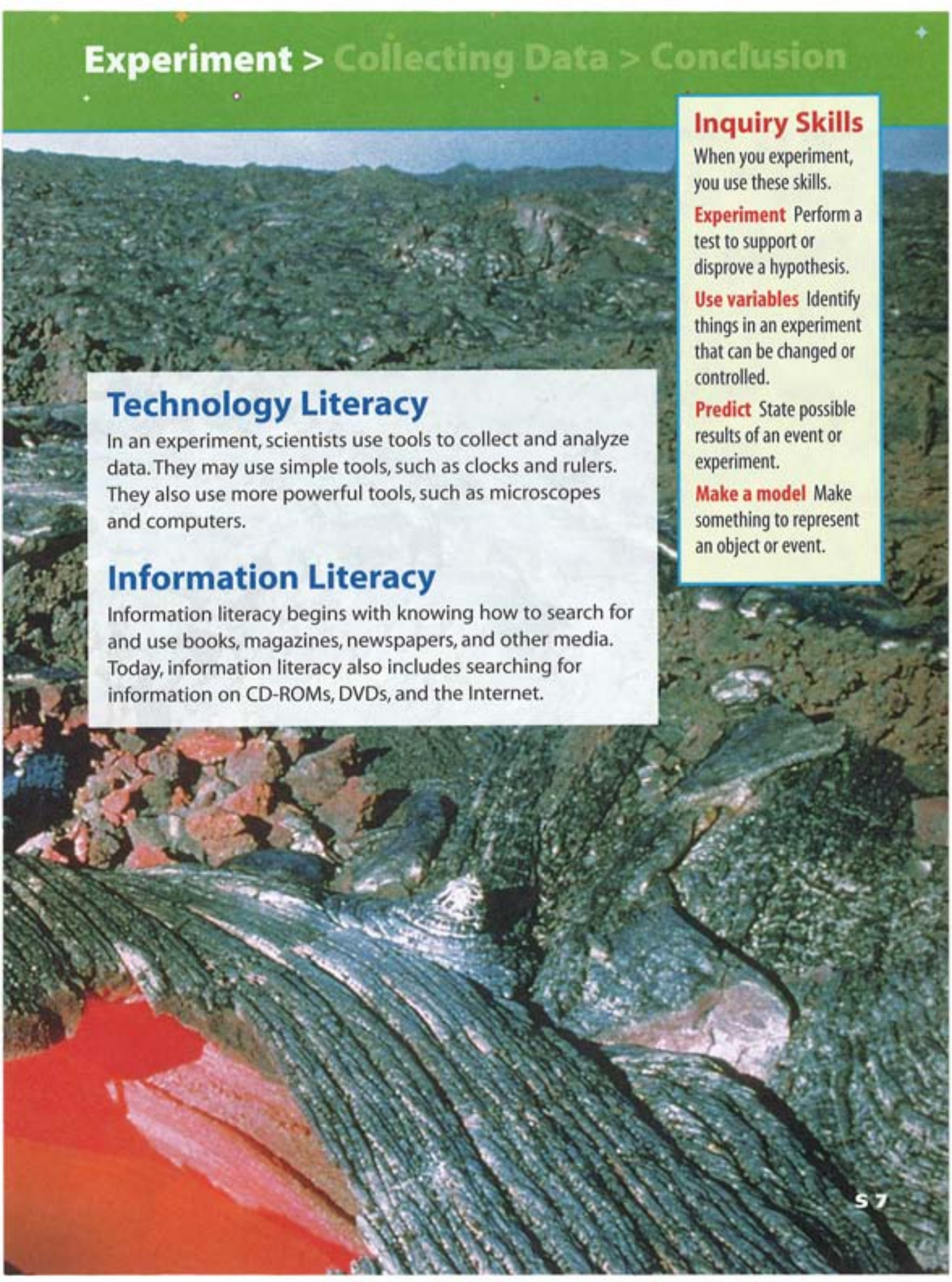
Define terms based on observations Put together a description that is based on observations and experiences.



A scientific test, or experiment, is used to test a hypothesis. Although scientists don't always wear lab coats and work in a laboratory, every good experiment must

- be able to be repeated.
- change only one variable at a time.

Why are these two rules important? First, scientists must be able to check each other's work for accuracy. Second, if more than one variable changes in an experiment, it may be difficult to find the variable that was responsible for the results. For example, scientists might measure the temperature of lava at different locations on a volcano. What would happen if they changed both the depth and the location at which they measured the temperature?



Inquiry Skills

When you experiment, you use these skills.

Experiment Perform a test to support or disprove a hypothesis.

Use variables Identify things in an experiment that can be changed or controlled.

Predict State possible results of an event or experiment.

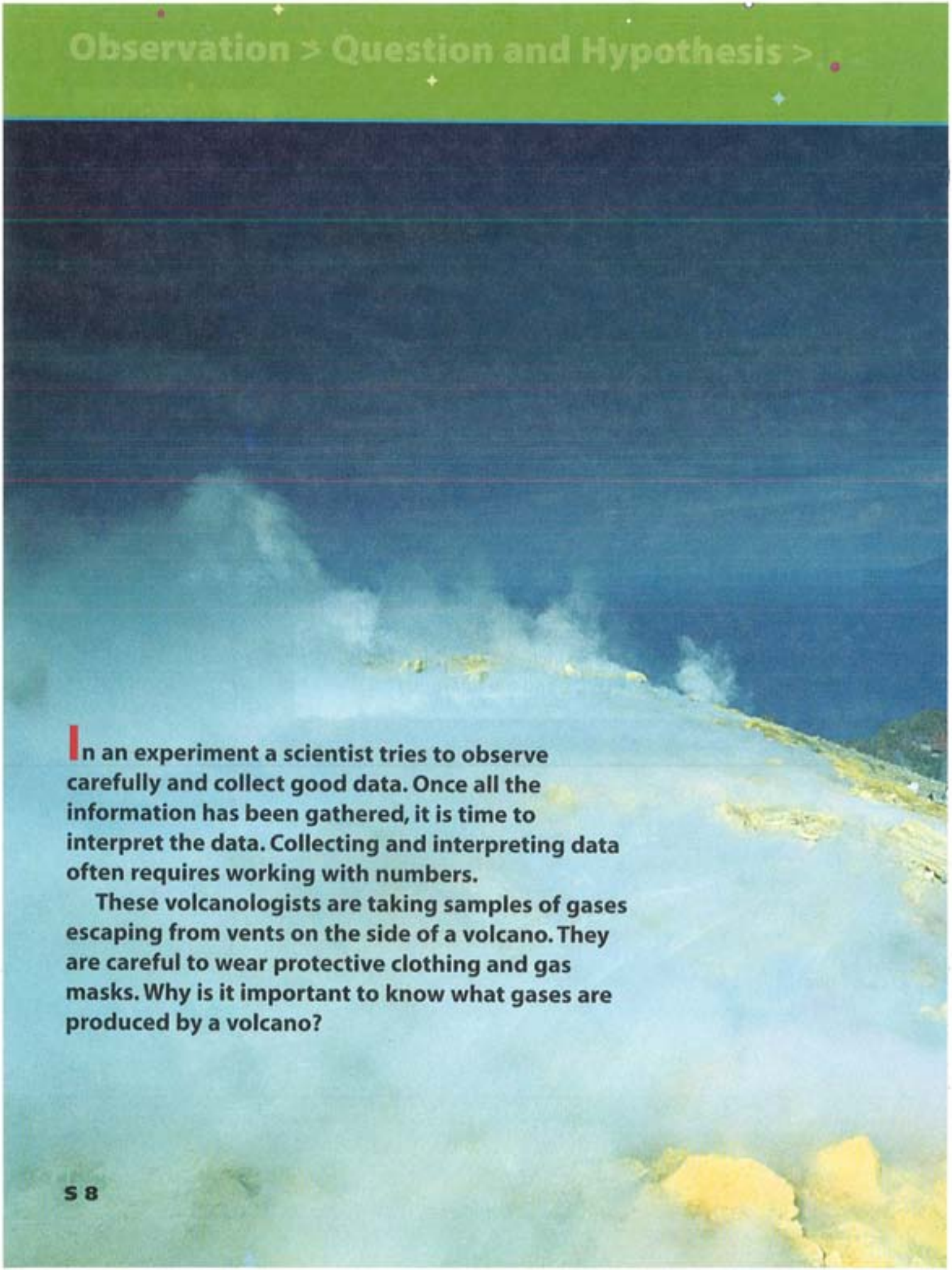
Make a model Make something to represent an object or event.

Technology Literacy

In an experiment, scientists use tools to collect and analyze data. They may use simple tools, such as clocks and rulers. They also use more powerful tools, such as microscopes and computers.

Information Literacy

Information literacy begins with knowing how to search for and use books, magazines, newspapers, and other media. Today, information literacy also includes searching for information on CD-ROMs, DVDs, and the Internet.



In an experiment a scientist tries to observe carefully and collect good data. Once all the information has been gathered, it is time to interpret the data. Collecting and interpreting data often requires working with numbers.

These volcanologists are taking samples of gases escaping from vents on the side of a volcano. They are careful to wear protective clothing and gas masks. Why is it important to know what gases are produced by a volcano?

Math Literacy

Scientists often use math skills when they collect and interpret data as part of their experiments. A **Math Link** in each lesson of this book asks you to use several types of math skills, including:

- **Number Sense and Operations** This includes estimation, addition, subtraction, multiplication, and division.
- **Measurement** This includes using and converting standard and metric units of size, distance, time, volume, area, mass, weight, or temperature.
- **Data Analysis and Probability** This includes calculating the likelihood that an event will happen, and making and interpreting bar graphs and line graphs.
- **Problem Solving** This means using skills and strategies to solve problems.

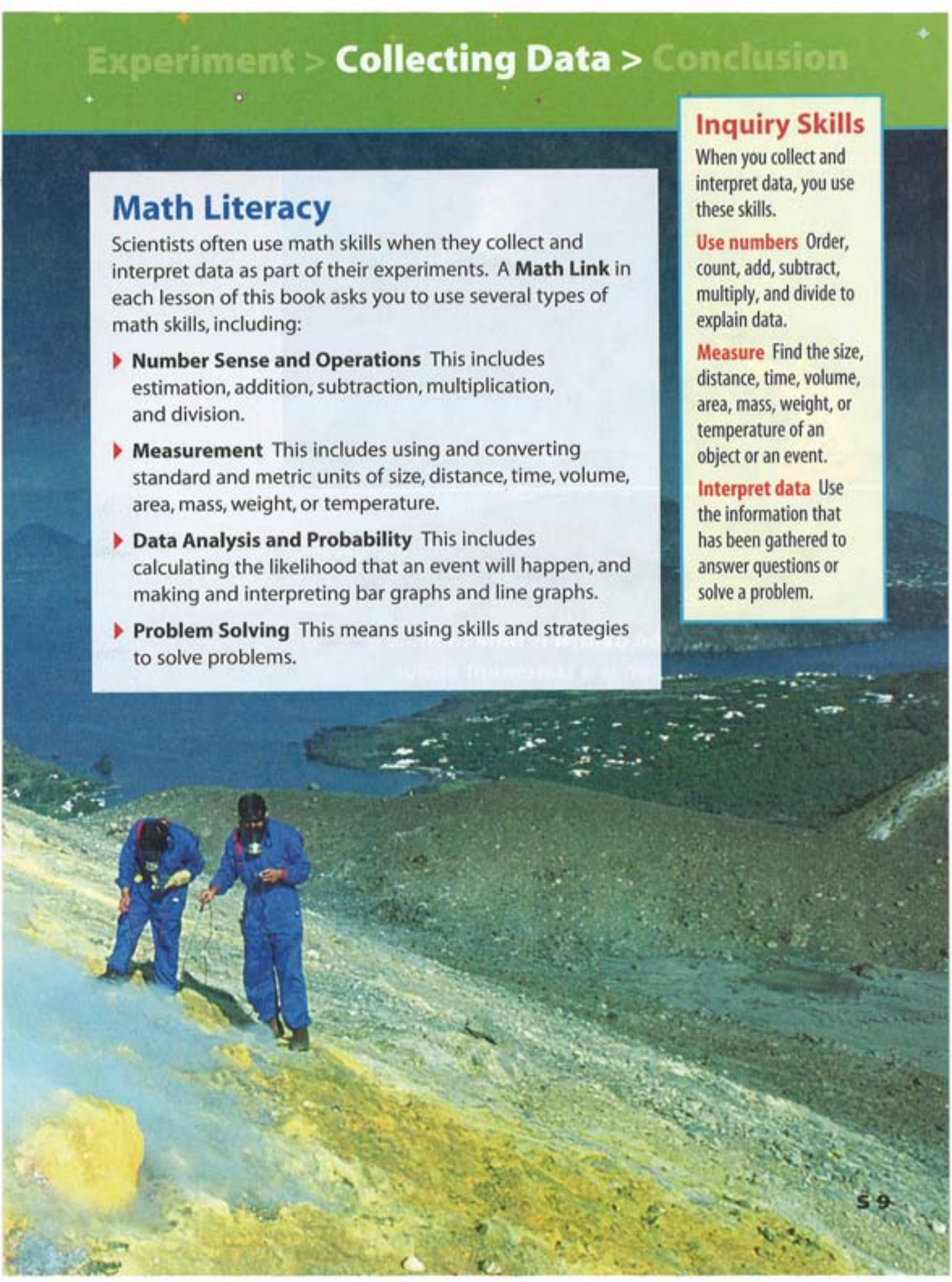
Inquiry Skills

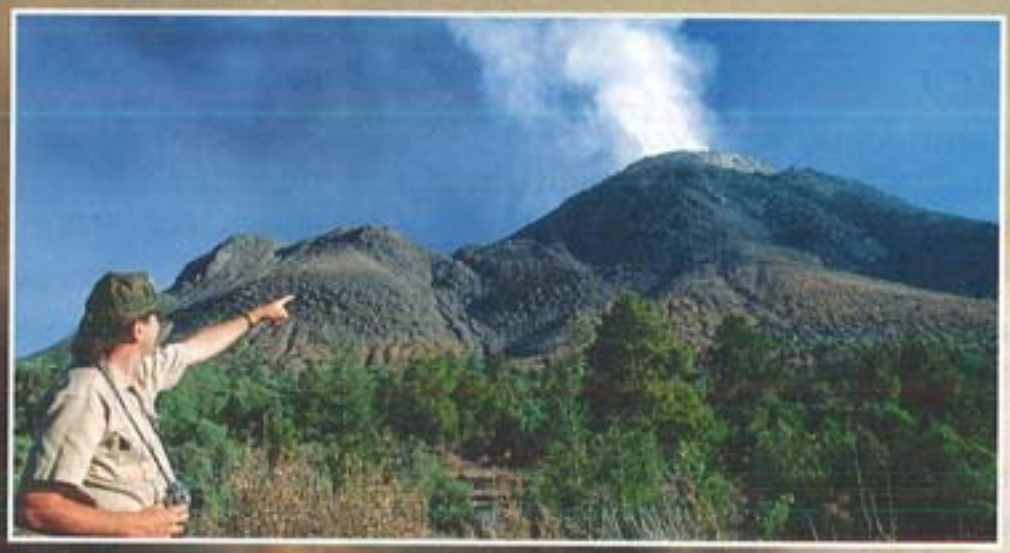
When you collect and interpret data, you use these skills.

Use numbers Order, count, add, subtract, multiply, and divide to explain data.

Measure Find the size, distance, time, volume, area, mass, weight, or temperature of an object or an event.

Interpret data Use the information that has been gathered to answer questions or solve a problem.





After interpreting the data, it is time to draw a conclusion. A conclusion is a statement about whether or not the hypothesis is valid based on the data collected. Sometimes the data do not support the hypothesis. Perhaps different experiments and observations are needed. A new question may result.

Scientists also tell other scientists, as well as members of the public, about what they have discovered. The United States Geological Survey (USGS) operates five volcano observatories. They observe activity leading to eruption, provide emergency information about future and ongoing eruptions, identify hazardous areas around active and potentially active volcanoes, and improve public understanding of how volcanoes erupt and change our environment.

Inquiry Skills

When you draw conclusions and communicate results, you use this skill.

Communicate Share information.

Writing in Science

Writing is a tool you can use to communicate, or share information, about science. A **Writing Link** in each lesson of this book asks you to use one of these types of writing:

- A **Personal Narrative** tells about an event in your life.
- **Writing a Story** uses characters, setting, and a sequence of events.
- **Persuasive Writing** tries to get your readers to agree with your opinion.
- **Explanatory Writing** tells how to make or do something.
- **Writing That Compares** tells how two things are alike and different.
- **Expository Writing** presents facts and explains ideas.

Using Your Book

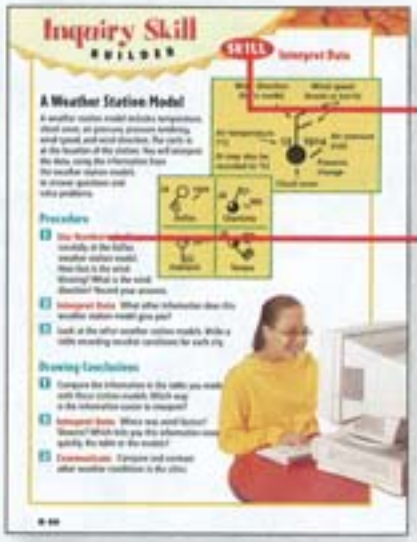
The **Explore Activity** is a hands-on way to learn about the lesson. The title is in the form of a question that you will answer in the activity.

The **inquiry skills** in the Explore Activity are the same skills that scientists use.

The last step of the activity provides an opportunity for **further inquiry**.

You can use different kinds of **Foldables™ organizers** to collect and record data in the Quick Lab.

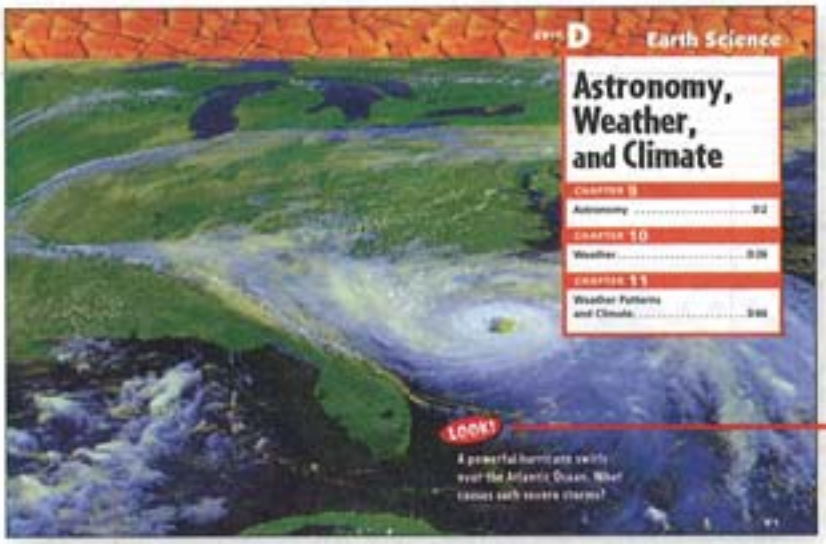
Inquiry skills are also used in the Quick Lab.



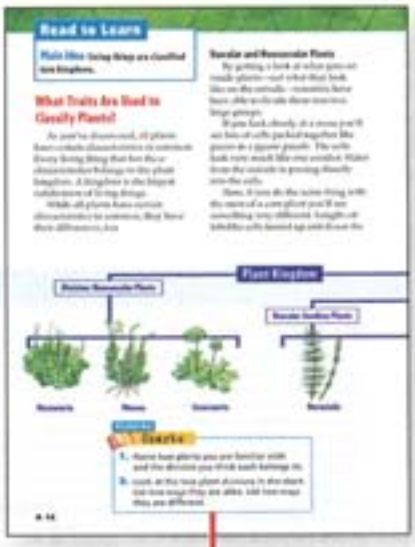
Each Inquiry Skill Builder focuses on a specific **inquiry skill**.

Other **inquiry skills** are also reinforced in the Inquiry Skill Builder.

Learn Through Visuals



Visuals include both **photographs** and **graphics**. This question will help you get information from the photograph at the beginning of each unit of this book.



Throughout all chapters of this book you will get information by **reading graphics**. Graphics are pictures such as:

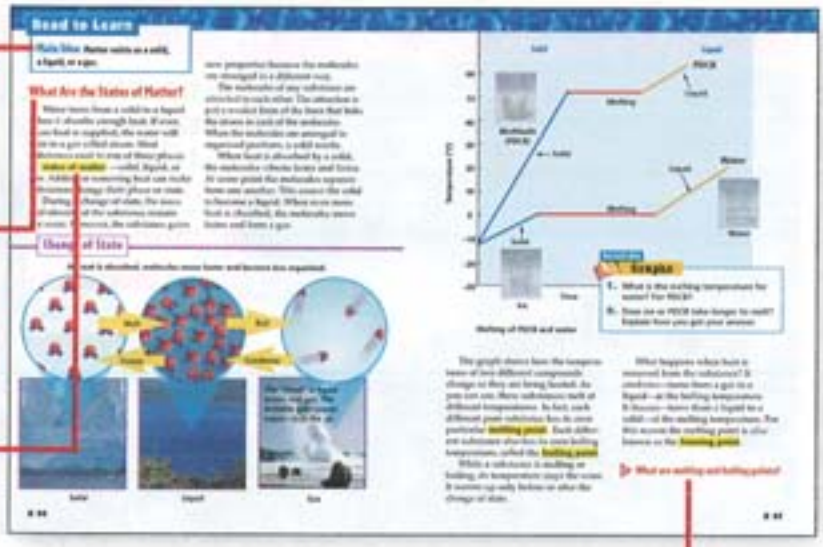
- diagrams
- charts
- maps
- graphs

Learn Through Reading

This box contains the **Main Idea** of the lesson. Keep the main idea of the lesson in mind as you read.

Before Reading Read the large red question before you read the page. Try to answer this question from what you already know.

During Reading Look for new **Vocabulary** words highlighted in yellow. Look at the pictures. They will help you understand what you are reading.

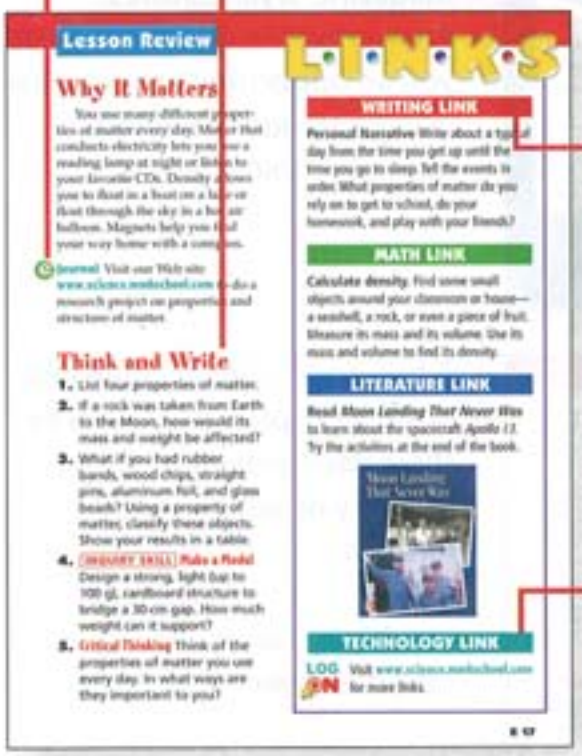


After Reading This arrow points to a question. It will help you check that you understand what you have read. Try to answer the question before you go to the next large red question.

On one page in each lesson, you will find a question that practices the **Chapter Reading Skill**. In any chapter, you will find one of these skills:

- compare and contrast
- main idea and supporting details
- predict
- cause and effect
- draw conclusions
- sequence of events
- summarize

Learn Through Writing and Technology



At the end of every lesson, you can log on to **e-Journal** for tips and suggestions about how to write a research report.

Think and Write questions at the end of every lesson give you an opportunity to write about what you learned in the lesson.

A **Writing Link** at the end of every lesson allows you to express yourself through several different types of writing:

- Personal Narrative
- Writing a Story
- Persuasive Writing
- Explanatory Writing
- Writing That Compares
- Expository Writing

A **Technology Link** at the end of every lesson gives you an opportunity to log on to our Web site www.science.mmhschool.com for additional links.

Write About It questions on selected Sally Ride Science, Time for Kids, and magazine-style features give you an opportunity to write about what you learned.

A **LogOn reference** on every Sally Ride Science, Time for Kids, and magazine-style feature allows you to learn more about each topic.

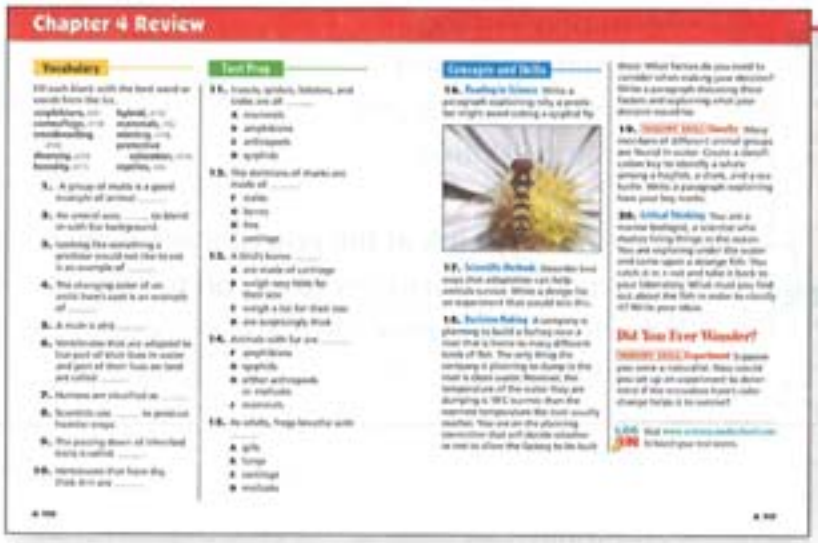
Prepare for Assessment


Science Magazine

ANIMALS: ICY SURVIVAL

What Did I Learn?

There are **What Did I Learn? questions** on selected Sally Ride Science, Time for Kids, and magazine-style features. Answering the questions gives you an opportunity to practice using a standardized test, multiple choice format.


Chapter 4 Review

Vocabulary

Test Prep

Concepts and Skills

Did You Ever Wonder?

A two-page **review** at the end of each chapter allows you to show what you know using a variety of assessment formats:

- fill-in
- multiple choice
- short answer


Performance Assessment

Name That MINERAL

What to Do

Analyze Your Results

SPOT the SOURCE

What to Do

Analyze Your Results

Performance Assessment at the end of every unit provides an opportunity to demonstrate what you've learned through hands-on activities and projects.