Chapter

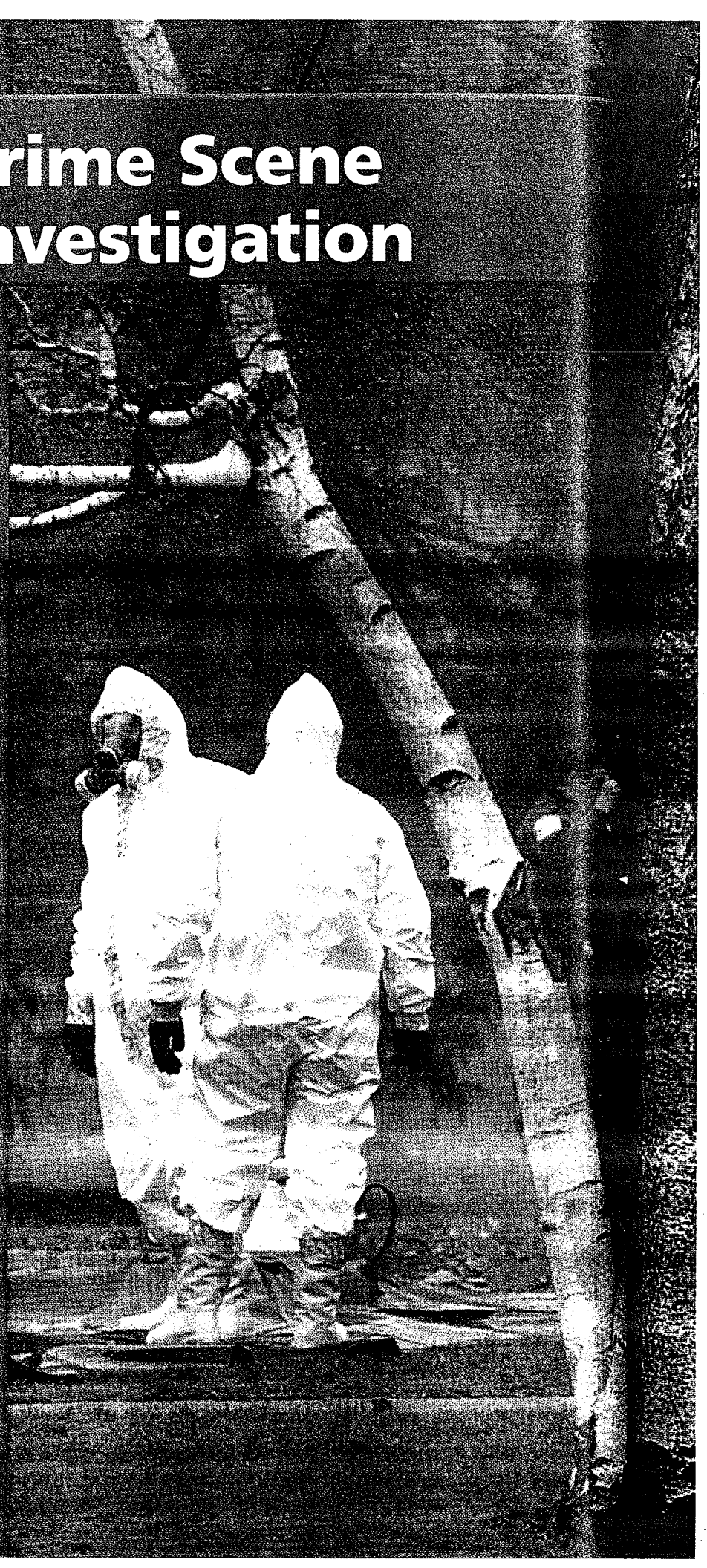
1 Crime Scene Investigation

Focus on the
BIG Idea
Scientific Inquiry

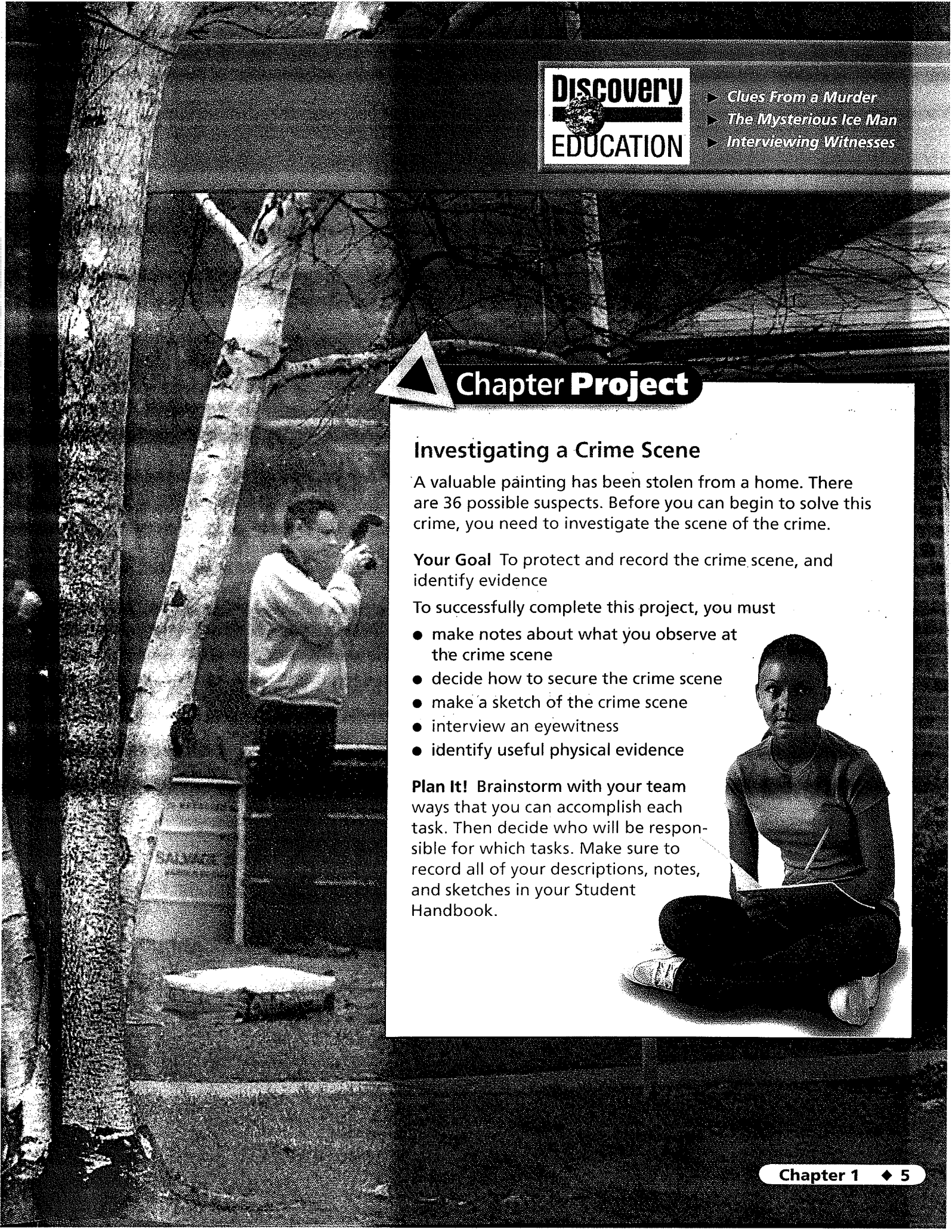
What inquiry skills do crime scene teams use as they develop an explanation for a crime?

Chapter Preview

1. Using Science to Solve Crimes
2. Securing and Recording a Crime Scene
3. Types of Evidence
4. Collecting Physical Evidence



A CSI must wear protective gear when working on a case of anthrax poisoning. ►



Discovery EDUCATION

- Clues From a Murder
- The Mysterious Ice Man
- Interviewing Witnesses

Chapter Project

Investigating a Crime Scene

A valuable painting has been stolen from a home. There are 36 possible suspects. Before you can begin to solve this crime, you need to investigate the scene of the crime.

Your Goal To protect and record the crime scene, and identify evidence

To successfully complete this project, you must

- make notes about what you observe at the crime scene
- decide how to secure the crime scene
- make a sketch of the crime scene
- interview an eyewitness
- identify useful physical evidence

Plan It! Brainstorm with your team ways that you can accomplish each task. Then decide who will be responsible for which tasks. Make sure to record all of your descriptions, notes, and sketches in your Student Handbook.

Lesson 1

Using Science to Solve Crimes

Reading Preview

Key Concepts

- What skills do people who investigate crimes use?
- How does working as a team help solve crimes?
- How do the methods used to solve crimes today compare with those used in the past?

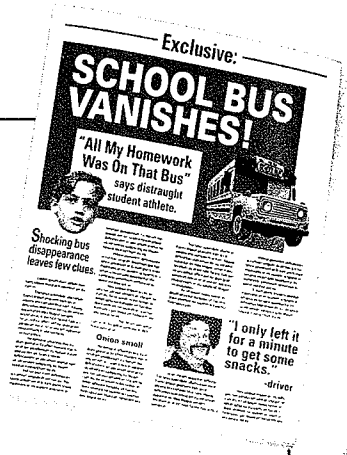
Key Terms

- burglary
- forensic science
- observing
- evidence
- inferring
- predicting
- hypothesis
- crime scene investigator
- medical examiner
- autopsy
- density

Target Reading Skill

Building Vocabulary After you read this lesson, use what you have learned to write a definition of each Key Term in your own words. Define a term by telling its most important feature or function.

Discover Activity



What Do You Know About Solving Crimes?

Which of these statements about solving crimes do you think are true and which do you think are false?

1. Every crime that is reported to the police gets solved.
2. It takes just a few hours to solve most crimes.
3. Crime scene investigators work only on murder cases.
4. One task of crime scene investigators is to track down and arrest suspects.

Think It Over

Making Judgments Where do you think most people get their information about how crimes are solved? Do you think this source gives people true or false ideas about how crimes are investigated? Give an example to support your answer.

A 9-1-1 call comes in to a police station. Someone broke into a ground-floor apartment. A valuable stamp collection that was kept in a locked desk drawer is missing. Breaking into a building to steal an object is a **burglary.**

The first officers to arrive see a broken window. Inside, there are shoe prints on the carpet. One officer says, "Those shoe prints come from two different shoes. There was more than one burglar." Then she looks at the desk. "Here are marks left by a tool. They must have pried open the drawer."

The other officer sniffs the air. "That smells like a perfume my wife wears," he says. "One of the burglars may be a woman." In the bedroom he finds a parrot who keeps saying, "Hurry up, Pat!" Could one burglar be named Pat?

This investigation shows science in action. From the time that investigators arrive at a crime scene, they use skills that scientists use. They observe details. They interpret what they see. They ask questions. They draw conclusions about what happened.

Science at a Crime Scene

The use of scientific knowledge and methods to answer legal questions is called **forensic science.** People sometimes call this field just "forensics." However, the complete term helps stress the connection between science and law.

Some members of an investigative team are scientists. Some are not. But all of them approach the situation with the same questions: What happened? When did it happen? Who could have done it? To find out, each investigator must think like a scientist. **The investigative team uses inquiry skills to help solve crimes. These skills include observing, inferring, predicting, and developing a hypothesis.**

Observing What were the officers at the burglary scene doing when they saw shoe prints, smelled perfume, and listened to a parrot? They were observing the crime scene. **Observing** is using one or more of your senses to gather information. People who investigate crime scenes rely on their senses of sight, smell, and hearing. They rarely use taste or touch.

Observing is a skill used to find evidence. In the legal system, **evidence** is something that can be presented in court to make a point during a trial. The evidence can be a statement from a witness. Evidence can also be an item collected at a crime scene or the results of tests done on that item. The place where an item is found can also be evidence. All the observations made at a crime scene can be used as clues to help solve a crime. But not every clue can be used as evidence, as shown in Figure 1.

Reading Checkpoint **Which senses do people who investigate crimes use most often?**

FIGURE 1
Clues vs. Evidence
Shoe prints on a carpet and words spoken by a parrot can both be clues. But only the shoe prints could be used as evidence in a trial.

Skills Activity

Observing

Your teacher will give you a list of five items to find in your classroom. When you find an item, record its location on the list. After you finish the task, answer these questions: Were some items harder to find than others? If so, what made these items harder to find?

Inferring Some things the officers said at the burglary scene were not observations. One officer said there was more than one burglar. The other said that one burglar might be a woman. These officers were inferring when they made these statements. **Inferring** is offering a reasoned opinion based on observations and experience. A statement made by a person who is inferring is called an *inference*. When you are inferring, you are using your ability to reason, not your senses.

It is possible to make more than one inference from one observation. For example, you see a moving van parked in front of a house. You could infer that someone is moving into the house or you could infer that someone is moving out. There is only one way to tell which inference is correct. You need to investigate further.

Predicting At the burglary scene, the officers used their observations to infer what had happened in the past. But observations can also help you infer what will happen next. **Predicting** is stating an opinion about what will happen in the future. Inferences about the future are called *predictions*. People who solve crimes use observations and past experience to make predictions.

You can use predictions to help you decide what to do next. For example, experience says that people who steal stamp collections may try to sell the stamps to a stamp dealer. So the police could contact dealers and give them a description of the stamps. You can use Figure 2 to practice making inferences and predictions.

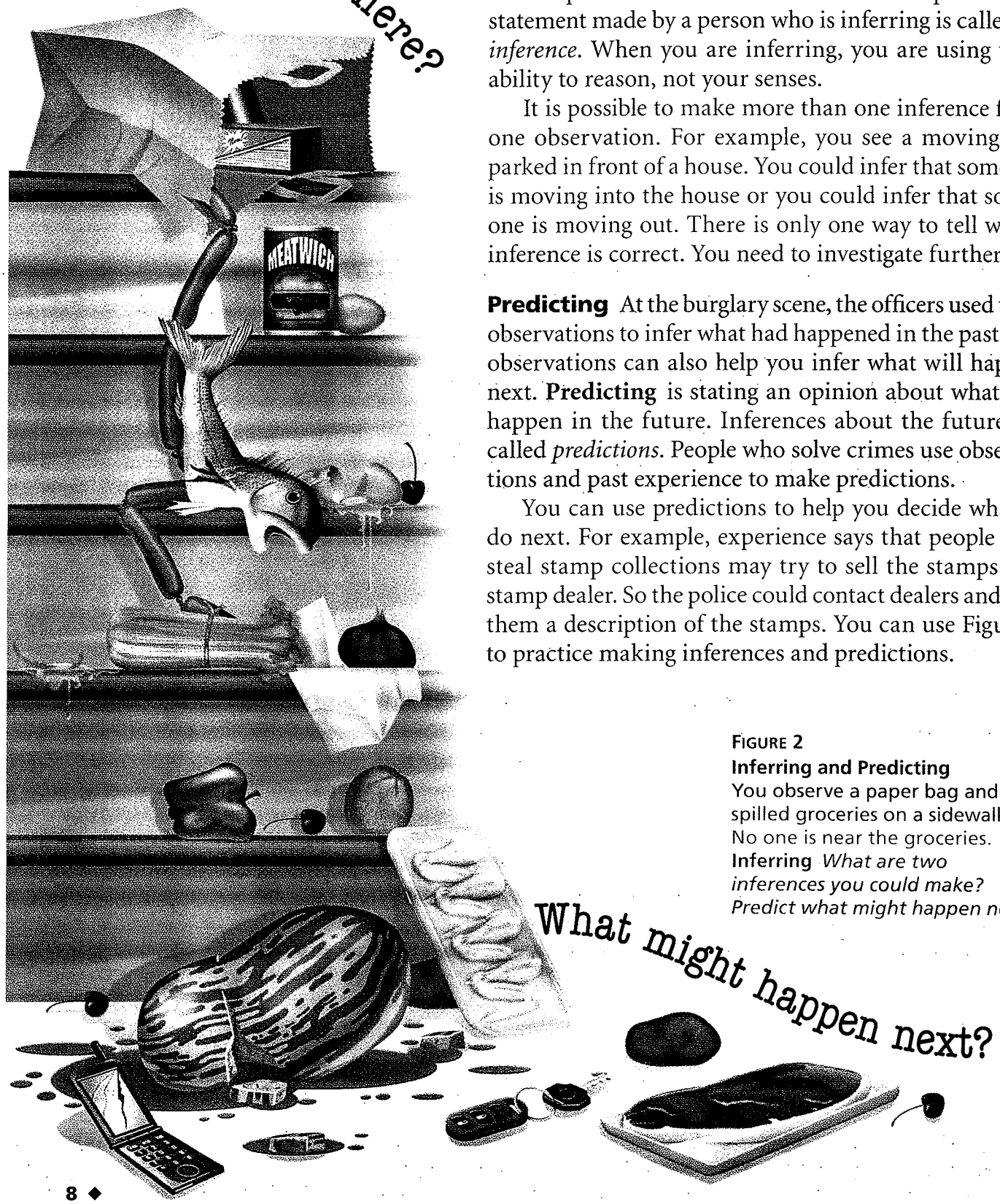


FIGURE 2
Inferring and Predicting
You observe a paper bag and spilled groceries on a sidewalk. No one is near the groceries.
Inferring *What are two inferences you could make?*
Predict what might happen next.

Inquiry Skills	Description	Forensic Science Examples
Interpreting Data	Analyzing data to look for patterns or trends	Deciding if a suspect's fingerprints match those at a crime scene; mapping locations of similar crimes
Classifying	Grouping together objects that are alike in some way	Typing blood; distinguishing cat hair from human hair
Making Models	Using a drawing, diagram, or a 3-D structure to represent a complex object or process	Making sketches or 3-D models of a crime scene; making a computer simulation of a crime
Communicating	Sharing ideas and information with other people	Taking notes at a crime scene; interviewing witnesses
Measuring	Making quantitative observations about the properties of an object or of a set of objects	Measuring the length of skid marks; using body temperature to determine time of death
Posing Questions	Asking questions that can be answered by gathering evidence	Which automobile models have this type of paint? Is the person who lost this contact lens nearsighted or farsighted?

FIGURE 3
Other Inquiry Skills
An investigator uses many inquiry skills to solve a crime.
Interpreting Data *Which skill is used to interview a witness?*

Developing a Hypothesis Sometimes what happened at a crime scene is obvious from the beginning. Sometimes the people who solve crimes must dig deeper to find an explanation. Scientists call a possible explanation for a set of observations a **hypothesis.**

There may be more than one reasonable hypothesis for a given set of facts. Think again about the case of the stolen stamps. Here are three possible hypotheses.

- One of the burglars knew about the collection and where it was stored.
- The burglars didn't know that the owner had a valuable stamp collection. They chose the apartment at random.
- The owner hid the stamps and staged the burglary to collect the insurance money.

The third hypothesis seems least likely. The first and second hypotheses fit the known facts. As of now, there is not enough evidence to support one hypothesis and reject the other.

Other Inquiry Skills Figure 3 lists some other inquiry skills that can be used to solve crimes. You will learn more about these skills in later lessons. In Lesson 2, for example, you will see why it is important to communicate and to make measurements at a crime scene.

Reading Checkpoint **What do people who solve crimes base their predictions on?**

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Forensic Science Video
Clues From a Murder