

Types of Evidence

Reading Preview

Key Concepts

- What are the benefits and drawbacks of direct evidence?
- What methods are used to help witnesses identify suspects?
- Why is physical evidence key to solving crimes?

Key Terms

- eyewitness
- direct evidence
- modus operandi
- surveillance camera
- physical evidence

Target Reading Skill

Posing Questions Before you read, preview the red headings in this section. In a graphic organizer like the one below, ask a *what* or *how* question about each heading. As you read, write the answers to your questions.

Question	Answer
What is direct evidence?	Direct evidence is observed by an eyewitness.

Discover Activity



Who Was That Person?

Your teacher will organize an event for you to observe.

1. Take a few minutes to record what you observed in your notebook. Include details that you think would help identify the person.
2. After about 10 minutes, the person will return to the classroom. Take a few minutes to observe the person again and revise your description.

Think It Over

Observing How accurate was your first description? Why was it difficult to write a detailed description?

People are in a convenience store picking out snacks. Two people are leaning on the counter talking to the store clerk. They're both wearing jeans and sweatshirts. Suddenly one of them says, "We have a gun. Give us all your cash. Then no one will get hurt!" The customers gasp and shrink back.

The clerk's hands shake as he empties the cash register and hands over the cash. The robber laughs and hands one of the dollar bills back to him. "Here. Buy yourself some chips."

After the robbers pull their hoods over their faces and leave, the clerk calls the police. Then everyone starts talking at once. "Did you see the gun?" "Were they both men?" "One was kind of short. Maybe it was a girl." "She had awfully big feet for a girl!"

When the police arrive, they will find the people who witnessed the crime. They will also find the dollar bill the robber gave to the clerk. The people and the bill provide two different types of evidence—direct evidence and physical evidence.

Direct Evidence

After the robbery, the convenience store clerk is excited. He calls his mother to tell her what happened. Now both of them know what happened. But only one has firsthand knowledge of the event—the clerk. He is an eyewitness.

Eyewitnesses An **eyewitness** is a person who directly observes an event. The clerk and customers at the convenience store are eyewitnesses. When the police arrive, they will ask each person to say what he or she saw or heard. These firsthand observations by eyewitnesses are **direct evidence**. This evidence can be used in court to prove a fact. For example, the clerk could testify to the fact that he saw two robbers.

Identifying witnesses is one of the first things officers do at a crime scene. They collect names, addresses, and phone numbers. The officers may also search the surrounding area to see if anyone else saw or heard what happened. **Some witnesses give accurate descriptions of what they saw or heard. But what a witness says is not always accurate.**

Problems With Direct Evidence The descriptions that eyewitnesses give at a crime scene may not match. One witness says the person drove a gray car. The other says the car was red. One witness says the person was wearing boots. Another can identify the brand of boot. One recalls things the person said. The other does not. Why are their observations different?

People's physical abilities, experiences, and emotions can affect their observations. A red car may look gray to a person who is colorblind, like the young man in Figure 12. Someone who works in a shoe store may recognize a boot brand. Or a witness may be too scared or angry to notice anything!

Another problem is that witnesses may be asked to recall events weeks or months after they happen. This can be difficult. If you were asked to say what you did on a given day last month, do you think you could remember?



How is direct evidence used?

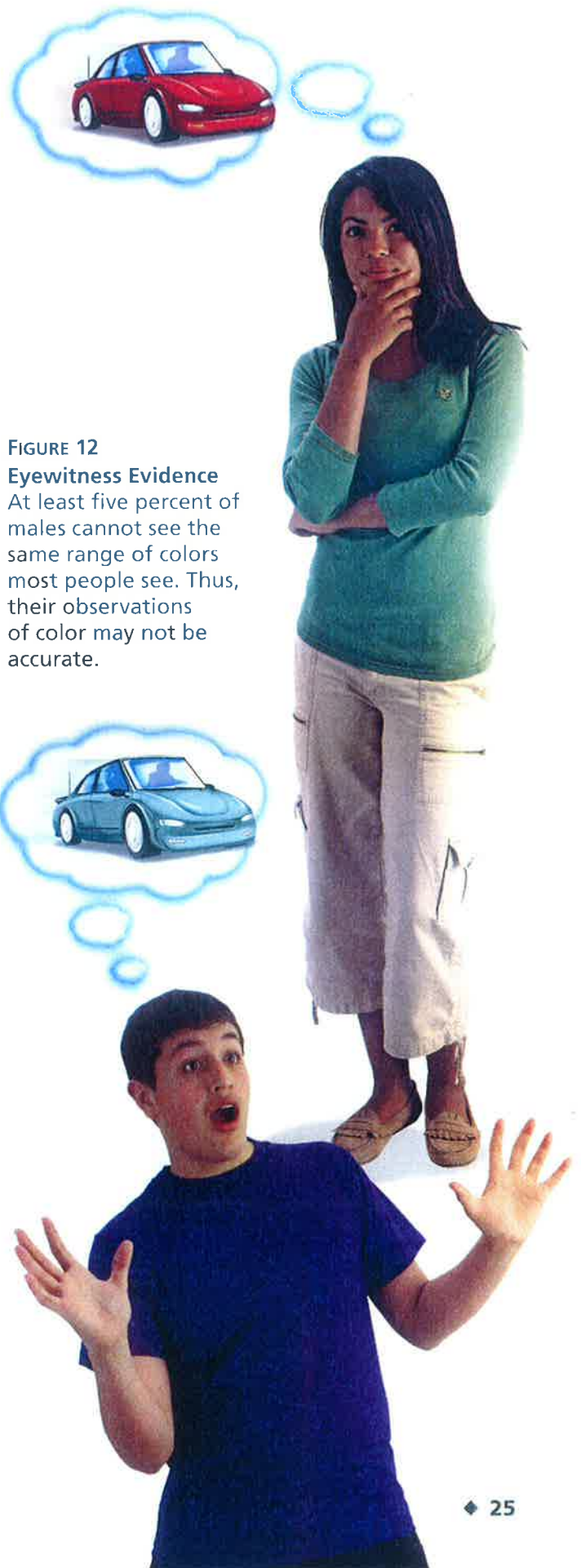


FIGURE 12
Eyewitness Evidence
At least five percent of males cannot see the same range of colors most people see. Thus, their observations of color may not be accurate.

Skills Activity

Controlling Variables

An eyewitness must be able to pick a suspect out of a lineup of people who look similar. So if a suspect wears glasses, everyone in the lineup must wear glasses. Make a list of traits that detectives need to control when they arrange a lineup.

Using Lineups and Mug Shots

Police have ways to help witnesses supply evidence that is useful. Police may ask a witness to view a lineup or look at mug shots to help identify suspects.

The Lineup You may have seen a lineup on TV or in a movie. If so, you know that the witness looks at the lineup through a one-way mirror so the suspect can't see the witness. The witness is looking for the person he or she saw at the crime scene. A person in the lineup may be asked to step forward so the witness can get a better view. Or each one may be asked to repeat words the witness recalls hearing at the crime scene.

When is the lineup useful? First, investigators need a likely suspect. Then they must design a lineup that is fair. All the individuals in the lineup must be similar in appearance. The lineup in Figure 13 isn't good. A good lineup would not include a person who is clearly older than the others.

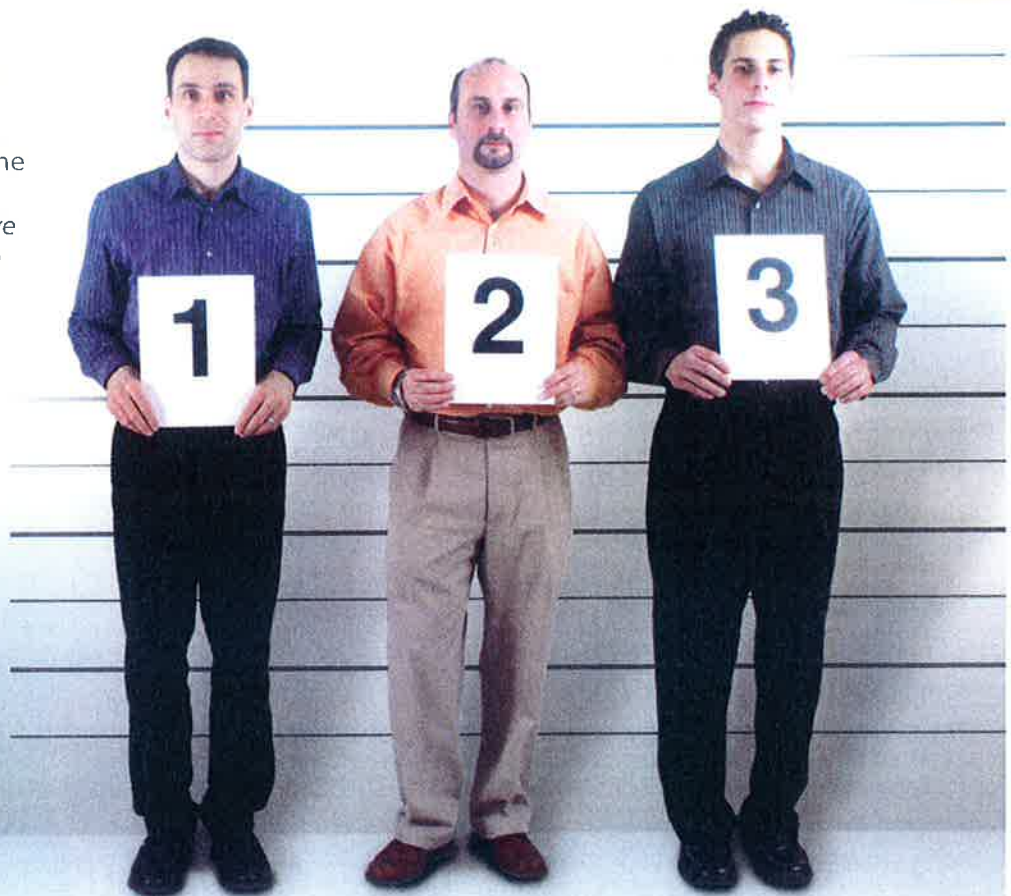
The results of a lineup may be misleading. Most witnesses assume that the person who committed the crime is in the lineup. Even if they are told that it is fine not to make a choice, they may feel pressured to identify *someone*. They may point out a person who only vaguely resembles the one they saw at the crime scene. If everyone looks similar, it is harder for a witness to pick out a suspect at random.

FIGURE 13

A Mock Lineup

This is an example of a poorly designed lineup. If this group were used in an actual lineup, the suspect could claim that the process was not fair.

Interpreting Photographs Give three reasons why all of these people should not appear in the same lineup.



Mug Shots If the suspect has a criminal record, police can show witnesses mug shots, like the one in Figure 14. Mug shots are the photos taken when a person is arrested. The photographer takes a front and side view. The same rules apply to mug shots that apply to lineups. For the process to be fair, a witness must view photos of similar-looking people.

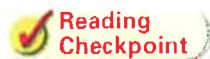
Police can use mug shots even when there is no specific suspect. They may ask a witness to browse through books filled with mug shots. This isn't an ideal situation. Police in large cities have so many photos on file that it is not practical for witnesses to look at them all. Besides, when people spend hours looking at photos, they may begin to lose interest or they may pick out the wrong person by mistake.

The police can speed up the process by narrowing the task. They can show photos of criminals with a **modus operandi**, or MO, that fits the crime. This Latin term means "mode of operation." A person's MO describes the way he or she approaches a task. For a criminal, this could mean working alone, picking a lock to gain entry to a building, or targeting older people.

FIGURE 14

Mug Shot

This 1975 photo is of Patricia Hearst. It was taken when she was arrested for her part in a bank robbery. Patty claimed she was forced to take part in the robbery by a group who kidnapped her in 1974.



Reading
Checkpoint

What is a mug shot?





FIGURE 15
Sketch Made by Hand
 A forensic artist interviewed witnesses. Then she drew this sketch of Timothy McVeigh.
Comparing and Contrasting
 Compare the sketch to the photo of Timothy McVeigh. Would you change any feature to make the sketch more realistic? Explain.

Picturing a Criminal

Mug shots won't help if the person who committed a crime has never been arrested. What other tools do investigators have? **Investigators can use sketches made by forensic artists to identify criminals. They can also use surveillance videos and facial recognition software.**

Making Sketches In 1995, a bomb destroyed a federal building in Oklahoma City. The blast killed 168 people. The FBI needed the public's help. A forensic artist talked with people at the agency where the truck that delivered the bomb was rented. She used what they told her to make the sketch in Figure 15. This sketch helped the FBI identify the bomber.

Until 1959, sketch artists drew their sketches by hand. In 1959, many artists began to use a kit that contained a library of facial features. The artist would choose features such as "wide-set eyes," "thin eyebrows," or "pointed nose." The witness might say, "No, the cheekbones were broader." They would go back and forth, working together to build a reliable portrait like the one in Figure 16.

Today, artists can use a software version of the kit to draw their sketches. With a computer, the process of building up a portrait is faster. Plus, the library of facial features is larger.

Some artists still think the choices are too limited. They prefer to sit with a witness and a sketchpad. These sketches take longer to draw, but they include more details and can account for unusual features.



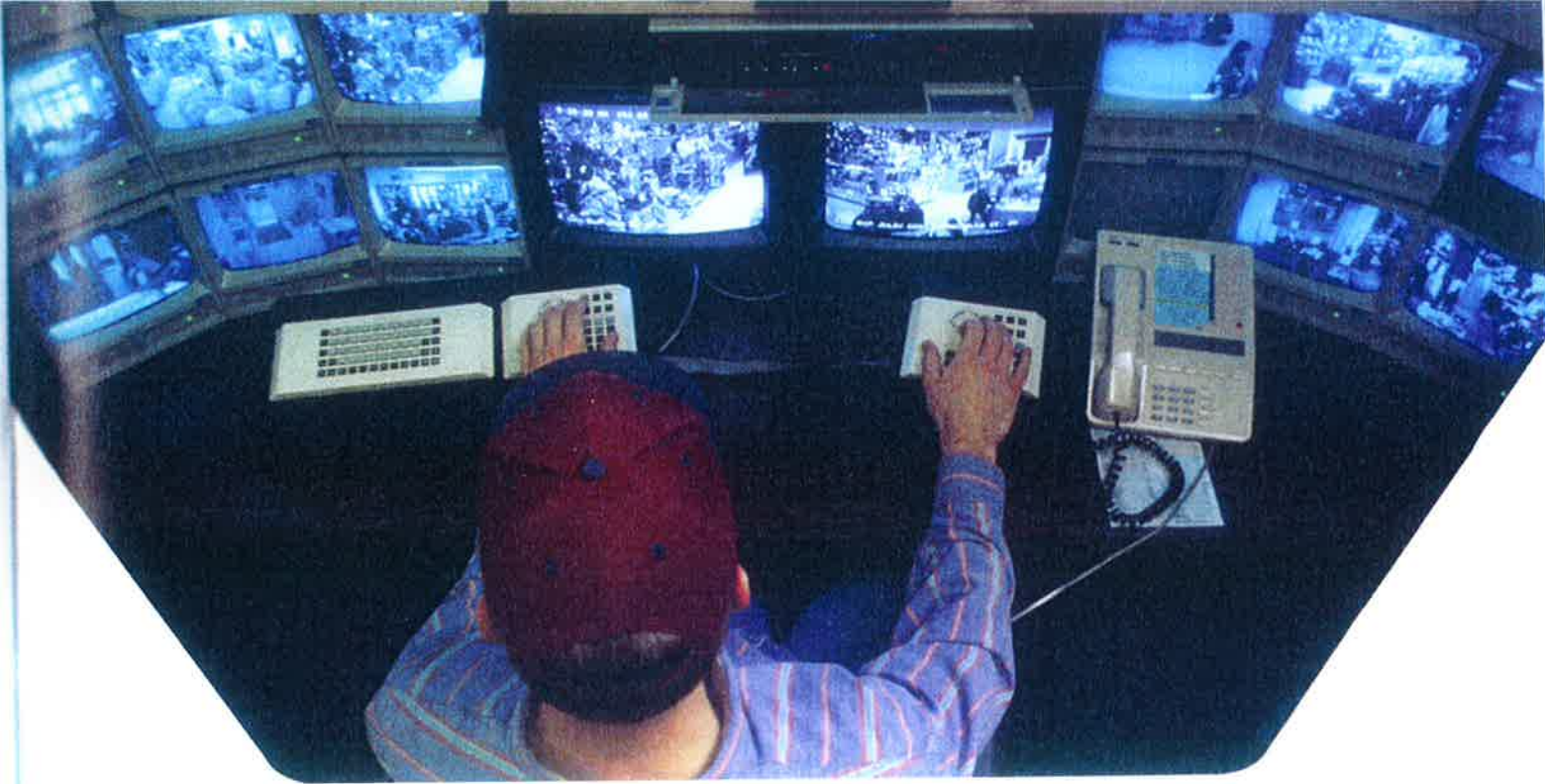
Reading Checkpoint

What tool used by forensic artists was invented in 1959?



FIGURE 16
Sketch Made With Kit
 An artist made this sketch by selecting facial features from a kit.





Surveillance Cameras When you're in a public place, there may be a camera watching. The cameras in banks, stores, and other public places are **surveillance cameras** (sur VAY luns). *Surveillance* comes from a French word meaning "to watch over." Sometimes you know that these cameras are watching. There's a sign saying "CCTV in use." CCTV stands for closed circuit TV.

If a crime takes place within view of a surveillance camera, the camera records the action. In theory, this evidence should be very useful. Unfortunately, the images on these videos are often gray and blurry. It is hard to match the images with an actual suspect's face.

Facial Recognition Software Investigators may need to show that a suspect was at a specific place at a given time. The place could be a cash machine, a gas station, or a store. A camera at the location may have captured a video image of the suspect. If so, the video has a date and time stamp. What can be done to convince a viewer that the image on the video is really the suspect?

There is computer software that can match a video image to an image in a database of mug shots. The software works by measuring distances between facial features. It measures these distances on the face in the video image. Then it searches for mug shots with similar measurements. The software can search up to 60 million images a minute. If the software makes a match, a person checks to make sure the match is accurate.

FIGURE 17

Surveillance Videos

In a large store, there may be many surveillance cameras. One person can sit in a room and watch what is happening at locations throughout the store.



Forensic Science Video
Interviewing Witnesses

Physical Evidence

Investigators are aware of the problems with direct evidence. So they try to rely more on physical evidence. In the legal system, **physical evidence** is any object that can be used to prove that a fact is true. The object could be a scrap of paper, a knife, or a hair. Some physical evidence is found at a crime scene. Some may be found at other locations related to the crime. Physical evidence can be the key to solving a crime.

Transfer of Evidence The girl in Figure 18 leaves a bit of herself everywhere she goes. You do, too. You also move materials from one place to another. You may track mud from a yard into a kitchen on your shoes. You may carry sand back from the beach in your bathing suit.

Edmond Locard (1877–1966), a French scientist, was one of the first to see how the transfer of materials could be used to solve crimes. One time Locard was investigating a case of counterfeit, or fake, coins. There were three suspects. Locard asked the police to bring him the suspects' clothes. When he examined the clothes, he found tiny bits of metal caught in the seams and other creases. Chemical analysis showed that the metal of the fake coins was the same as the bits in the clothing. Police arrested the suspects, who later confessed.

Locard's Principle Based on his work, Locard proposed an idea that is central to forensic science. He said, "Every contact leaves a trace." This idea is called Locard's Principle. **Forensic scientists know that there is always a transfer of physical evidence at a crime scene.** No matter how careful they are, criminals always leave some physical evidence behind. Plus, they always carry away physical evidence from a crime scene.



magnification: 10x



magnification: 650x

FIGURE 18

Transfer of Evidence

People leave physical evidence wherever they go. This girl will shed about 100 hairs a day and about 50,000 flakes of skin every minute.

Predicting *What materials might she pick up while running cross country?*



FIGURE 19

Role of Technology

Edmond Locard's tools were much simpler than those used by modern forensic scientists.

Making Judgments Do you think it is easier for modern scientists to solve crimes than it was for Locard? Why or why not?

Locard's Influence Locard had studied both medicine and law. In 1910, he set up his own police laboratory in Lyons, France. He worked in a cramped attic room and had only a few simple instruments, like the one in Figure 19. But he soon became famous for his research into forensic science. His work inspired police in other countries to set up laboratories. In the United States, the FBI set up its first lab in 1932. Today, the FBI lab is one of the largest forensic labs in the world.

Lesson 3 Assessment

Target Reading Skill Posing Questions Use your graphic organizer and the answers you wrote to help you answer the questions below.

Reviewing Key Concepts

- Defining** What is direct evidence?
 - Making Generalizations** When is direct evidence useful? Why is direct evidence not always reliable?
 - Predicting** An off-duty detective sees a person trying to steal a car. Would you expect the detective to provide accurate direct evidence? Why or why not?
- Reviewing** What methods do police use to help witnesses identify a likely suspect?
 - Relating Cause and Effect** Why might an eyewitness identify the wrong person?
 - Problem Solving** When investigators don't have a likely suspect, what are two ways a witness can help identify a suspect?

- Defining** What is physical evidence? List three examples.
 - Describing** What did Locard say happens to physical evidence at a crime scene?
 - Applying Concepts** Show how Locard used his principle to solve the case of the fake coins.

Writing in Science

Descriptive Paragraph You want an artist to make a sketch of a family member or friend. The problem is you do not have a recent photo of the person. Using your memory, write a "word picture" of the person. Provide details that will help the artist make a lifelike portrait.