

Collecting Physical Evidence

Reading Preview

Key Concepts

- What should investigators do before they begin to search a crime scene?
- How do investigators make sure that evidence found at a crime scene can be used in court?
- What can investigators do to keep safe at a crime scene?

Key Terms

- contamination
- chain of custody

Target Reading Skill

Outlining As you read, make an outline about collecting physical evidence. Use the red headings for the main ideas and the blue headings for supporting ideas.

Collecting Physical Evidence

- I. Organizing a Search
 - A. Consider the Crime Scene
 - B. Pick a Search Pattern
- II. Keeping Evidence Useful

FIGURE 20
Searching in a Line
 When people form a line and search as a group, they are less likely to miss a small object.

Discover Activity

How Would You Collect This Evidence?

Your teacher has placed evidence at different locations in your classroom. Each location has a number. Do Step 1 as you move around the classroom. Then return to your seat and do Step 2.

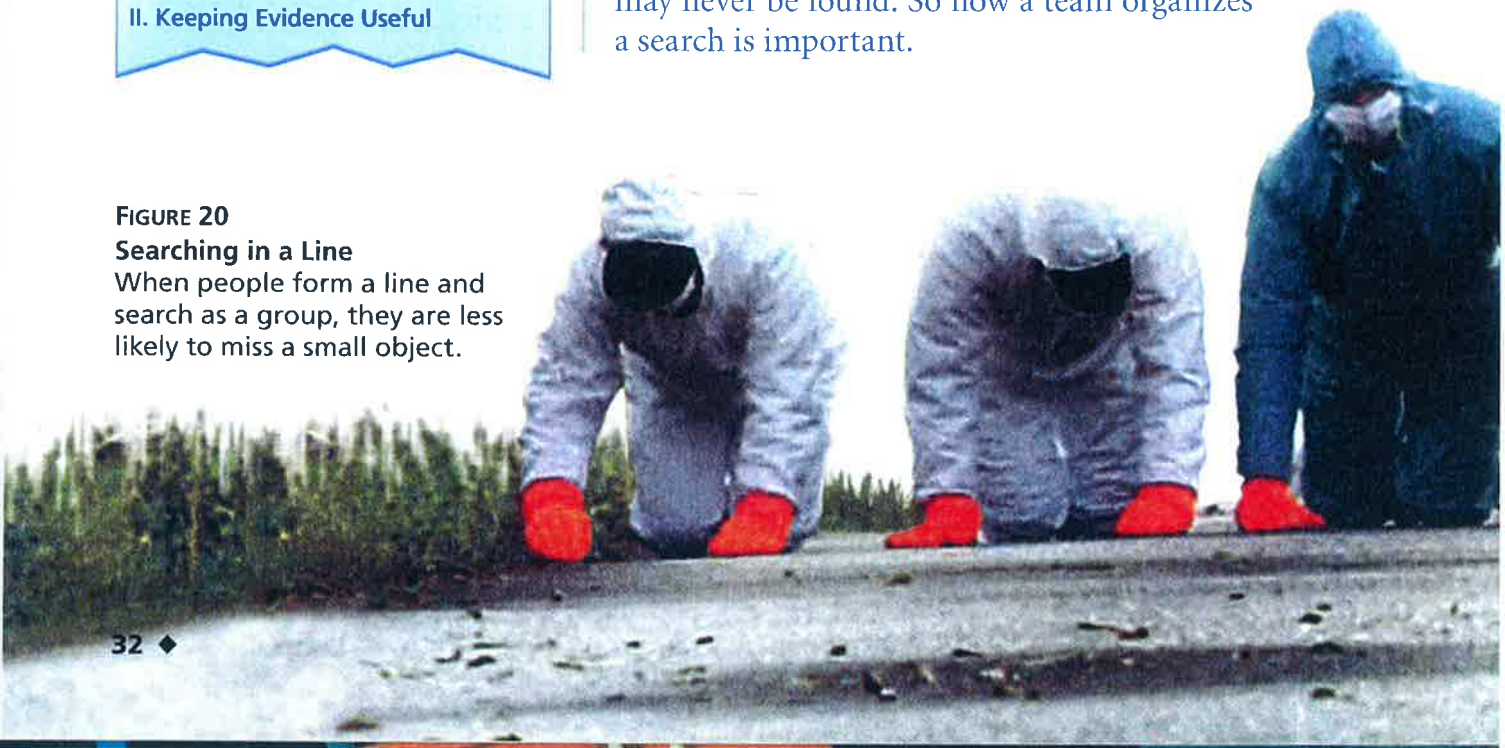
1. Observe and identify each piece of evidence. Record this information in your notebook. Do not touch or remove any of the evidence.
2. For each piece of evidence, describe how you could collect the evidence if you were a CSI.

Think It Over

Drawing Conclusions What equipment do you think a CSI should bring to a crime scene to collect evidence?

It is your first day working as a CSI at an actual crime scene. You want to show your boss that you know how to do your job. You have a kit full of equipment for gathering evidence. You pull on gloves to make sure that any fingerprints found at the scene won't be yours! You look around and wonder where to start.

The way that a CSI searches for evidence can have a big effect on a case. If searchers don't find evidence early on, it may never be found. So how a team organizes a search is important.



Organizing a Search

Each search is a little different. But one rule applies to all crime scenes. The crime scene team must search in an organized way. If not, they are likely to miss some important pieces of evidence. **The team needs to consider the crime scene and pick a search pattern before they begin a search.**

Consider the Crime Scene Some crimes occur in a small space—a store or an apartment. Others, such as an explosion, scatter evidence over a huge area. For crimes that take place outdoors, weather is an issue. Because weather can destroy evidence, these crime scenes may have to be searched quickly. If the crime scene is a car, a CSI is likely to do a quick initial search at the scene. Then the CSI will have the car towed to a garage for a more detailed search.

Pick a Search Pattern Search patterns are designed to cover every inch of a crime scene. A team picks a search pattern based on the size of the crime scene and the size of the objects they are looking for. The investigators in Figure 20, for example, are creeping along the ground in a line, shoulder-to-shoulder. They are using a strip, or line, pattern. This pattern can be used to look for a small object in a large area.

Figure 21 shows other search patterns. A grid pattern is like a strip pattern, except that every area is searched twice. Searchers cross the scene in one direction. Then they cross it again at right angles. Searchers may also divide a crime scene into zones. The zones are labeled so that searchers can record where evidence is found.



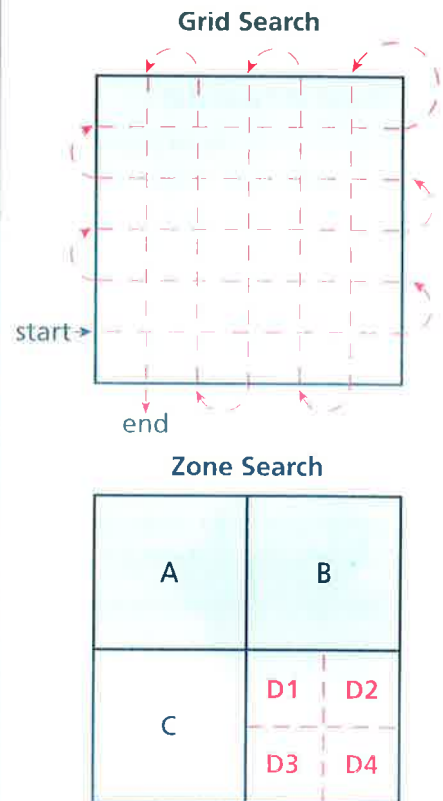
Reading Checkpoint When might a CSI need to do a quick search?

FIGURE 21

Grid and Zone Searches

These drawings compare two typical types of search patterns.

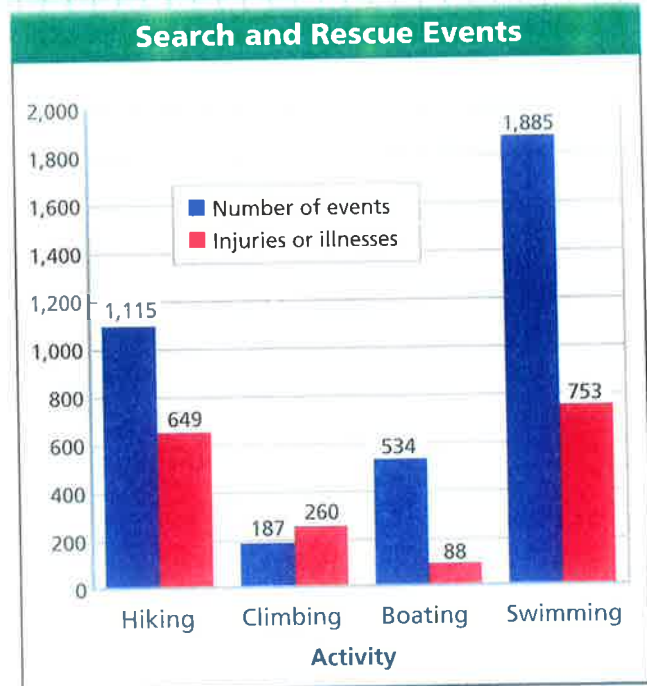
Predicting Which pattern are investigators likely to use to search a house? Explain.



Search and Rescue Events

Rangers who work for the National Park Service may need to rescue visitors who are lost, ill, or injured. So the rangers need to understand search patterns. The graph shows data about some search and rescue events that took place in national parks in one year.

- 1. Reading Graphs** For which activity were there 187 events?
- 2. Calculating** How many people were injured or became ill while boating or swimming?
- 3. Estimating** What is the ratio of swimming events to swimming injuries or illnesses?
- 4. Interpreting Data** There are about six times as many hiking events as climbing events. Yet you could argue that hiking is a safer activity than climbing. What data could you use to support this argument?
- 5. Developing Hypotheses** If hiking is generally safer than climbing, how can you explain the difference in number of events?



Keeping Evidence Useful

Investigators don't just collect evidence to solve a crime. They want to be able to use the evidence later in a trial. What if a judge says key pieces of evidence can't be used in a trial? The case may have to be dropped for lack of evidence and a guilty person may go free. There are steps investigators can take to keep this from happening. **Crime scene investigators must prevent contamination at the crime scene. They also must have the right equipment, package the evidence correctly, and keep a chain of custody.**

Preventing Contamination The adding of unwanted material to an object is called **contamination**. A CSI wears clothing that is designed to prevent contamination of a crime scene. A head cover, for example, keeps the CSI from adding hairs to the scene. Booties protect shoes so that soil caught in shoe treads won't be left at the scene. Gloves allow a CSI to pick up an object without transferring dead cells, sweat, or oil from his skin to the object.



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Having the Right Equipment What evidence do investigators look for? For most crimes, they look for fingerprints. For a burglary, they may look for tool marks where burglars forced open a door or window. For a hit-and-run, they look for evidence they can use to identify the vehicle. This could be glass from a broken headlight or marks made by tire treads. With violent crimes, they look for evidence that may have been transferred to the victim from the attacker.

Investigators need to be prepared for any situation. They start with an equipment kit like the one in Figure 22. The kits have tools for collecting different kinds of evidence. If a CSI needs to cut out a piece of carpet that is stained with blood, for example, she can reach for a box cutter or scalpel. Here are some other examples of how some tools are used.

- ▶ A brush, powder, and tape are used to collect fingerprints.
- ▶ A hand lens is used to get a closer view of a small object.
- ▶ Tweezers and forceps are used to pick up small objects.
- ▶ Swabs are used to collect evidence from a victim.
- ▶ A small vacuum cleaner with an attached filter and screen can be used to sweep a rug or a car's interior.
- ▶ A screwdriver can be used to remove a doorknob or even a door so it can be sent to the crime lab.



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What can a CSI use to pick up small objects?

FIGURE 22
Equipment Kit

Some items in an equipment kit are standard, such as fingerprint powders. But other items will vary depending on the kit.

Applying Concepts Most kits include an evidence ruler. When might a CSI use this item?



Fingerprint
powder and
brush

Evidence ruler

Packaging Evidence Correctly Evidence kits have containers a CSI can use to package evidence. These may include paper bags, envelopes, and plastic bottles. In general, each piece of evidence is packaged separately. The CSI has to choose the right container for each item. For example, a bloody shirt would first be allowed to dry. Then it is packed in a paper bag. Figure 23 explains how to pack five other pieces of evidence.

The CSI must make sure evidence isn't lost as it moves from a crime scene to a storage area or crime lab. Containers must be sealed so the contents cannot leak or spill out. Some evidence is fragile, or easily damaged. A drinking glass, for example, can break if it is dropped. So investigators may use plastic wrap with bubbles, cardboard, or cotton cloth to protect fragile items.

Some police departments have vans that are called mobile crime scene labs. These vans are expensive, but they do help to keep the evidence safe. They carry refrigerators and other equipment for packaging and storing physical evidence. The word *lab* in mobile crime scene lab is a bit misleading. Most vans do not carry equipment for testing evidence.

FIGURE 23
These instructions for packing evidence come from a handbook written by the FBI.

Interpreting Data Which items should not be packed in a plastic container?

Sample	Instructions
A drop of blood on a windowsill	Use a cotton swab. Leave part of the swab unstained as a control. Air-dry the swab and pack in clean paper or an envelope with sealed corners. Do not use a plastic container.
Cigarette butts from a sidewalk	Pick up with a gloved hand or forceps. Air-dry and pack in clean paper or an envelope with sealed corners. Do not use a plastic container.
Hair from a pillow	Pick up with forceps. Package in clean paper or an envelope with sealed corners. Do not use a plastic container.
Bits of glass from a broken window	Package in a leakproof container such as a plastic film canister or pill bottle. Do not use a paper or glass container.
Soil caught in the sole of a shoe	Do not remove the soil from the shoe. Air-dry the shoe. Then put the shoe in a paper bag.



FIGURE 24

Chain of Custody

Evidence could be in a lab, in a storage room, or in a courtroom. The people who handle the evidence at each location need to maintain a chain of custody.



Keeping a Chain of Custody A lawyer defending a suspect may claim that evidence was not handled correctly. If the judge agrees, the evidence cannot be used in the trial. One way to fight the claim is to show the chain of custody for the evidence. A **chain of custody** is a written record of who had control of a piece of evidence from the time it was collected. The record contains names, dates, and places. There must be no gaps in the record, that is, no times when the evidence is not secured.

An accurate chain of custody helps show that an item being presented in court is the item that was found at the crime scene. When a CSI packages an item, she labels the outside of the container with the date and adds her name or initials. She makes sure the evidence is secure until it is handed off to someone else.

The log shows everyone who had contact with the evidence. For example, an investigator may check out a piece of evidence from storage, observe the evidence, and return it. The evidence may be sent to a lab for testing. If so, the log will show when it was sent, who tested it, what he did, and when it was sent back. Figure 24 illustrates one possible chain of custody.



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When does a chain of custody begin?

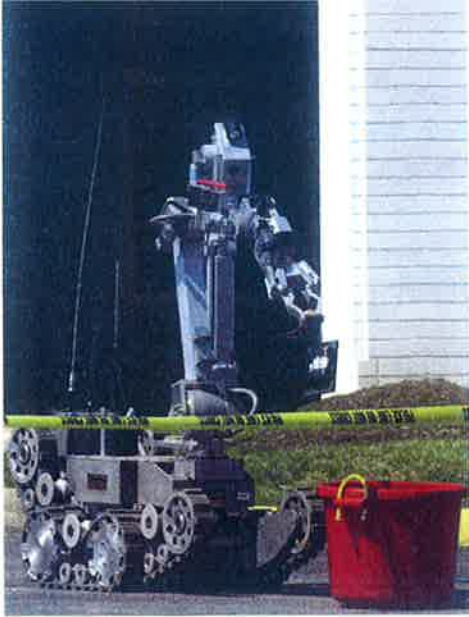


FIGURE 25
Hazardous Duty Robot
 At a bank, the bomb squad finds a device that they suspect will explode. They use a robot to place the device into a bucket.


Protecting the Investigators

It's not only evidence that must be protected at a crime scene. People who work at the scene can be at risk. They may have to handle blood that is infected. They may find explosives or drugs. What crime scene investigators do to protect themselves is similar to what you do during a lab at school. **Crime scene investigators protect themselves by following established safety rules and procedures.** Here are a few examples.

- ▶ Poisons, viruses, and bacteria can enter a person's body through the skin, nose, or mouth. So a CSI does not eat, drink, chew gum, or put on makeup at a crime scene.
- ▶ At some crime scenes, a CSI adds a mask, goggles, and an extra pair of gloves. If a piece of protective clothing is torn, it must be replaced.
- ▶ A CSI handles knives, razor blades, broken glass, and other sharp objects with care.
- ▶ Sometimes a CSI must work in a building that has been damaged where there is a danger of injury from falling objects. The CSI needs to wear a helmet and sturdy shoes.

Some situations call for people with extra training. For example, disarming an explosive device is a task for a bomb squad. They, in turn, may use a hazardous duty robot like the one shown in Figure 25.

Lesson 4 Assessment

 **Target Reading Skill** **Outlining** Use the information in your outline about collecting evidence to help answer Question 2.

Reviewing Key Concepts

1. a. **Reviewing** Why is it important to search a crime scene in an organized way?
 b. **Applying Concepts** What factors influence the choice of a search pattern?
 c. **Comparing and Contrasting** How do a line search and a grid search differ?
2. a. **Summarizing** What are four things a CSI needs to do to keep evidence useful?
 b. **Inferring** A CSI is using a hand lens and tweezers. What does this tell you about the evidence the CSI is trying to collect?

3. a. **Listing** What are three hazards that investigators may face at a crime scene?
 b. **Making Generalizations** How do crime scene investigators protect themselves at a crime scene?
 c. **Drawing Conclusions** Why should a CSI replace torn clothing quickly?

Math Practice

4. **Area** Twenty people use a strip pattern to search a field. Each strip is 2 meters wide and 80 meters long. What is the area of the field in square meters? *Hint:* It might help to draw a diagram of the field.