

UNIT 2 CRIME SCENE INVESTIGATION AND EVIDENCE COLLECTION

1. FUNDAMENTALS/OBSERVATION & RECORDING

- MA LEARNING STANDARD(S)/OBJECTIVES**
- ✓ SIS1. Make observations, raise questions, and formulate hypotheses.
 - ✓ SIS2. Design and conduct scientific investigations.
 - ✓ SIS3. Analyze and interpret results of scientific investigations.
 - ✓ SIS4. Communicate and apply the results of scientific investigations.

- Student Objectives**
- summarize Locard's exchange principle
 - identify four examples of trace evidence and
 - distinguish between direct and circumstantial evidence
 - summarize the three steps of a crime scene investigation
 - explain the importance of securing the crime scene
 - identify the methods by which a crime scene is documented
 - demonstrate proper technique in collecting and packaging trace evidence
 - describe how evidence from a crime scene is analyzed

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Vocabulary: summarize the definitions

Chain of custody	
Circumstantial evidence	
Class evidence	
Crime scene investigation	
Direct evidence	
First responder	
Individual evidence	
Paper bindle	
Primary crime scene	
Secondary crime scene	
Trace evidence	

CHAPTER 2 CRIME SCENE INVESTIGATION AND EVIDENCE COLLECTION

A crime cannot be committed without a perpetrator leaving some sort of evidence behind at the scene, no matter how minute. The proper security of a crime scene, collection of evidence, and preservation of that evidence before, after, and during that crime are vital to finding and convicting the perpetrator of that crime.

LESSONS FROM THE JONBENET RAMSEY CASE

The 1996 homicide investigation of six-year-old JonBenet Ramsey provides valuable lessons in proper crime-scene investigation procedures. From this case, we learn how important it is to secure a crime scene. Key forensic evidence can be lost forever without a secure crime scene.

In the Ramsey case, the police in Boulder, Colorado, allowed extensive contamination of the crime scene. Police first thought JonBenet had been kidnapped because of a ransom note found by her mother. For this reason, the police did not search the house until seven hours after the family called 911. The first-responding police officer was investigating the report of the kidnapping. The officer did not think to open the basement door, and so did not discover the murdered body of the girl.

Believing the crime was a kidnapping, the police blocked off JonBenet's bedroom with yellow and black crime-scene tape to preserve evidence her kidnapper may have left behind. But they did not seal off the rest of the house,



The Ramsey Home in Boulder, Colorado.

which was also part of the crime scene. Then the victim's father, John Ramsey, discovered his daughter's body in the basement of the home. He covered her body with a blanket and carried her to the living room. In doing so, he contaminated the crime scene and may have disturbed evidence. That evidence might have identified the killer.

Once the body was found, family, friends, and police officers remained close by. The Ramseys and visitors were allowed to move freely around the house. One friend even helped clean the kitchen, wiping down the counters with a spray cleaner—possibly wiping away evidence. Many hours passed before police blocked off the basement room. A pathologist did not examine the body until more than 18 hours after the crime took place.

Officers at this crime scene obviously made serious mistakes that may have resulted in the contamination or destruction of evidence. To this day, the crime remains unsolved. Go to the Gale Forensic Sciences eCollection for more information on this case.

What mistakes were made by the Boulder City police department in searching the crime scene?

What specific kind of evidence may have been compromised?

What could the police have done differently to secure the crime scene and the evidence?

Ask a family member about the case. What do they remember? Did they believe a family member was involved?

Physical Evidence Notes

Name _____

1. The value of trace forensic evidence was first recognized by Edmund _____ in 1910. The Locard's Exchange Principle states that "with _____ between two items, there will be an _____."

2. Complete each section below as you discuss the notes in class.

Paint

What is an example of a "class" characteristic? _____

What is an example of an "individual" characteristic? _____

Glass

What are three characteristics of glass that could be used to match glass from a crime scene to a suspect?

Explosives

How do scientists match bombs and other explosive devices to suspects? _____

Ballistics

What does the abbreviation GSR represent? _____

What is rifling? _____

What does the acronym IBIS mean? _____

Dust & Dirt

How could dust or dirt be used in an investigation? _____

Fingerprints

What are the 3 main types of fingerprints? _____

What does the acronym AFIS mean? _____

Impression Evidence

Give 3 examples of impression evidence. _____

Fractures Matches

What are fracture lines? _____

Give an example of a type of evidence that might be identified using a fracture match. _____

Wounds

What information can be learned from a wound? _____

Documents

Besides handwriting, what else could an investigator use to match a ransom note to a suspect? _____

Insects

What type of insects are helpful in a murder investigation? _____

What is PMI? _____

DNA

What types of tissues might be used for DNA testing? _____

What does the acronym CODIS mean? _____

Skeletal Remains

What 4 things can be determined from skeletal remains? _____

What type of scientist studies skeletal remains? _____

Body Fluids

What type of clues could investigators get from body fluid samples? Give two examples.

Hairs & Fibers

How can hairs and fibers be used in an investigation? _____

What must be present in a hair sample to test for DNA? _____

Catching Killers: Trace Evidence

Answer the following questions while watching this episode of Catching Killers.

1. What was the first real piece of evidence left behind by the I-5 Killer?
2. List 4 example of Trace Evidence
 - a. _____
 - b. _____
 - c. _____
 - d. _____
3. Summarize what can be specifically told about hair when viewed microscopically.
4. Give a brief summary of the history of trace evidence
5. Describe the case that made Locard famous.
6. Why is it important to collect evidence quickly?
7. Who was the prime suspect in Locard's case? What evidence did he collect from him?

8. Fill-in the following table

	Description of Method
Picking	
Light Sources	
Lifting	

- 9. What type of method was used on Darcie's dress? _____
- 10. Describe the fibers found on Darcie's dress
- 11. How did police originally find Roger Kibbe?
- 12. Explain, in complete sentences, what made Kibbe's car fibers go from indistinguishable to being considered an individual match?
- 13. How could fingernail scrapings be used differently today than they were in 1912?
- 14. Would cosmetics be enough to identify a suspect today? Why or why not?
- 15. What made Kibbe's white cord different from all the other possible mass produced white cords?
- 16. Why was Kibbe originally only convicted of Darcie's murder? What allowed him to be convicted of the other murders?