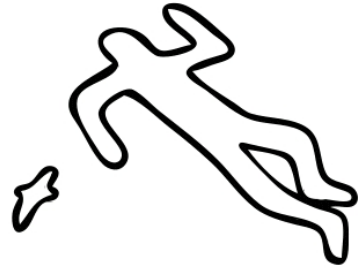


FORENSIC SCIENCE CHAPTER 2 NOTES

Outcomes: After studying this chapter you should be able to:

- * COS 1.1 Explain how to search, sketch, and record data from a crime scene.
- * Define physical evidence
- * Discuss the responsibilities of the first police officer who arrives at a crime scene
- * Explain the steps to be taken to thoroughly record the crime scene
- * Describe proper procedures for conducting a systematic search of a crime scene for physical evidence
- * Describe proper techniques for packaging common types of physical evidence
- * Define and understand the concept of chain of custody
- * Relate what steps are typically required to maintain appropriate health and safety standards at the crime scene
- * Understand the implications of the *Mincey* and *Tyler* cases



2-1 Processing the Crime Scene

- Physical evidence is the keystone for crime labs.
- **Physical evidence** encompasses any and all objects that can establish that a crime has been committed or can provide a link between a crime and its victim or a crime and its perpetrator.
- The presence of physical evidence must first be recognized at the crime scene for it to be used effectively.
- Crime labs do not solve crimes, but enhance the ability of police officers to have successful outcomes for their criminal investigations.
- Forensic science begins at the crime scene.
- The investigator must be able to recognize physical evidence and properly preserve it for lab examination, or it will be useless.
- Crime-scene investigation techniques are not difficult to master and are easy enough for the average police officer to perform.
- A crime scene is processed in a certain order:
 - **SECURE & ISOLATE THE CRIME SCENE**
 - The first officer to arrive at the scene is responsible for securing the crime scene, seeing if anyone needs medical assistance, and arresting the perpetrator.
 - The highest priority must be made to exclude all unauthorized personnel from the scene to avoid destruction or contamination of evidence. Barricades, ropes, and police tape are often used, along with police guards.
 - **RECORD THE CRIME SCENE**
 - Once the scene is secured, the preliminary exam must begin. Recording of the crime scene becomes a critical piece to the investigation process, and the opportunity to record the scene in its original state must not be lost.
 - Investigators have only a limited amount of time to work a crime site in its untouched state.
 - The opportunity to permanently record the scene in its original state must not be lost.
 - Such records will not only prove useful during the subsequent investigation but are also required for presentation at a trial in order to document the condition of the crime site and to delineate the location of physical evidence.
 - Every step of the investigation should be documented thoroughly with an appropriate method.
 - Documentation of the crime scene is required for presentation as evidence at trial and to show where the physical evidence was found.
 - Photography, sketches, and notes are the three methods for crime-scene recording, and all three should be used when budget and personnel allow.
 - Photography
 - * A crime scene must be in an unaltered condition before being photographed. Nothing must be moved until it has been photographed from all necessary angles or it may not be admissible at trial. (The only

These notes will probably be the most helpful for processing your final exam crime scene. DO NOT lose this notes packet!

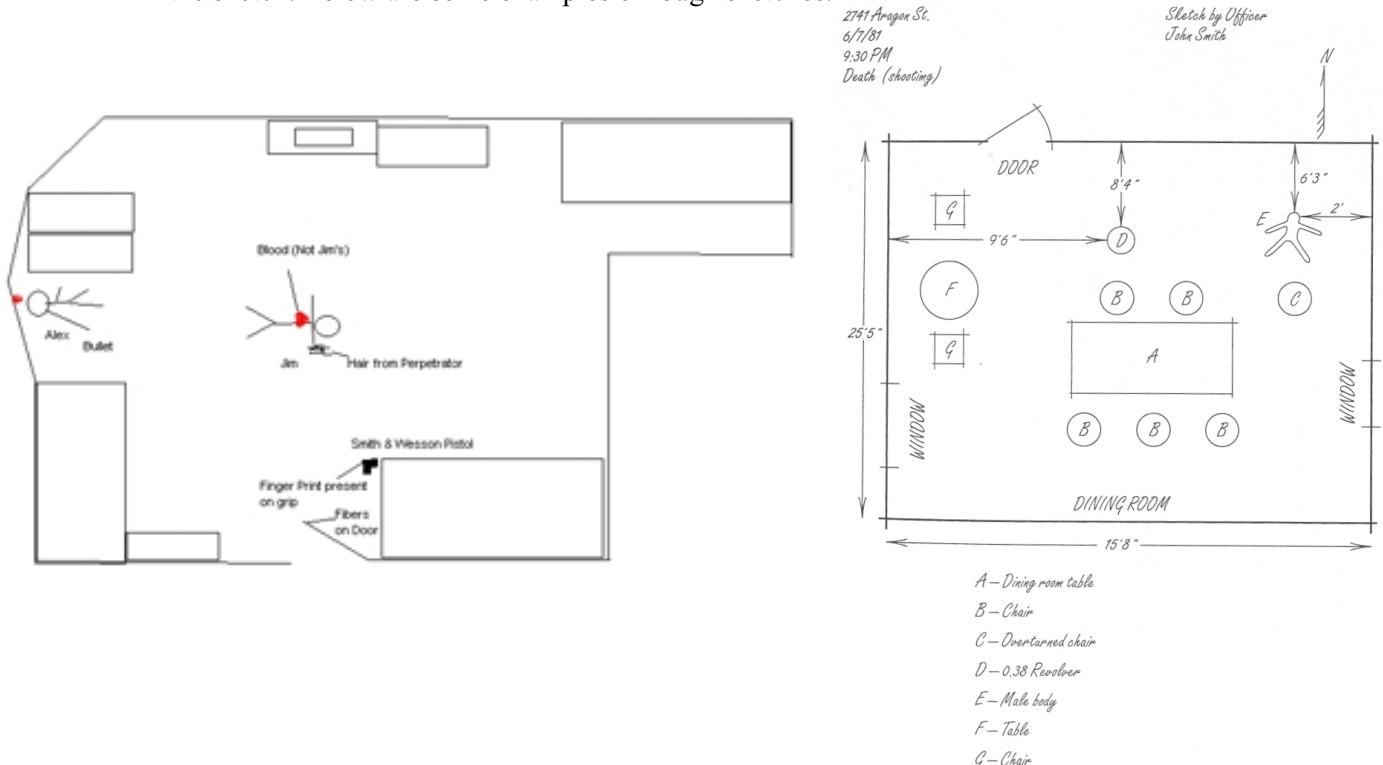
Headings in CAPITAL LETTERS are the steps you will use when processing your crime scene.

exception to this is an injured person taken to the hospital.)

- * Crime scenes should be photographed as completely as possible, including the area in which the crime took place and adjacent areas. The photographer should start with overviews and then move in for close-ups.
- * Items of evidence should be photographed to show their position and location relative to the entire scene. A measuring scale is included in the photograph to show relative size for small objects.
- * Videotaping is included as photography and the same principles used with photography apply. It may not be alone, though. Photography must be used also.

■ Sketches

- * The next step in recording a crime scene is sketching the scene. A rough sketch is done at the crime scene and then later a finished sketch is done, usually with computer assisted drawing software.
- * **Rough Sketch** — *A draft representation of all essential information and measurements at a crime scene. This sketch is drawn at the crime scene.*
- * A tape measure is used to measure the distance between an item of evidence and two fixed points, such as the walls of a room. Items of evidence are assigned a number or letter and a legend is placed below the sketch. Below are some examples of rough sketches.



- * **Finished Sketch** — *A precise rendering of the crime scene, usually drawn to scale. This type is not normally completed at the crime scene.*
- * CAD, computer assisted drawing programs, are used to make detailed final sketches that are used in the courtroom.
- * Computers can also be used to make drawings in three dimensions, as shown below.



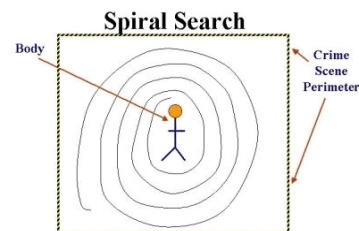
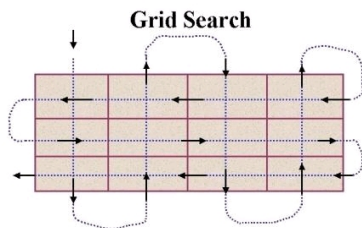
Do not attempt to make your crime scene sketches in 3-D. Draw them like the examples above, NOT like this one.

■ Notes

- * Notes must be taken constantly as the crime scene is processed, and must include a detailed written description of everything at the scene.
- * They must identify:
 - + the time an item of physical evidence was discovered
 - + by whom it was discovered
 - + how and by whom it was packaged and marked
 - + the disposition of the item after it was collected
- * The notes may be the only source of information for refreshing one's memory months or years after the crime occurred.
- * Tape-recording or narrating videotape allows detailed notes to be made much easier, faster, and in more detail than hand-written notes. However, these must be transcribed into written documents.

○ **CONDUCT A SYSTEMATIC SEARCH FOR EVIDENCE**

- A lead investigator will start the process of evaluating the area. Forensic scientists are not usually at the crime scene; the collection of evidence is done by trained evidence-collection technicians.
- First, the boundaries of the scene must be determined, followed by the establishment of the perpetrator's path of entry and exit.
- The investigator then proceeds with an initial walk-through of the scene to gain an overview of the situation and develop a strategy for the systematic examination and documentation of the entire crime scene.
- This is done before processing the crime scene for physical evidence.
- The search for physical evidence at a crime scene must be thorough and systematic.
- The search pattern selected will normally depend on the size and locale of the scene and the number of collectors participating in the search.
- There are several different search patterns that can be used, depending on the size of the crime scene and the number of evidence-collection technicians. Some examples are below in addition to those in your book.

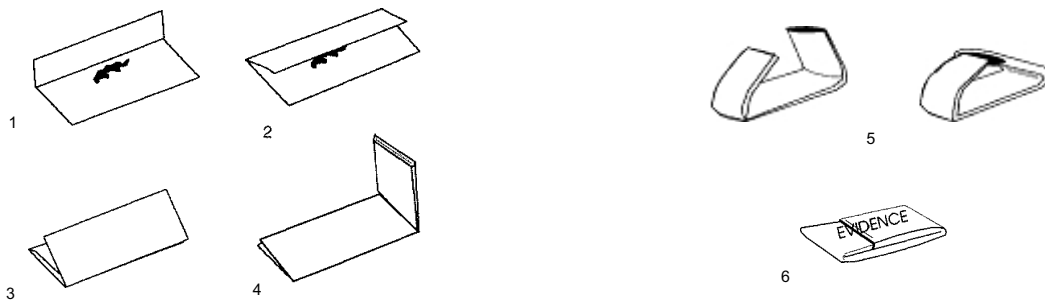


- For a factual, unbiased reconstruction of the crime, the investigator—relying upon his or her training and experience—must not overlook any pertinent evidence.
- Physical evidence can be anything from massive objects to microscopic traces.
- Often, many items of evidence are clearly visible but others may be detected only through examination at the crime laboratory.
- For this reason, it is important to collect possible carriers of trace evidence, such as clothing, vacuum sweepings, and fingernail scrapings, in addition to more discernible items.
- Vehicle searches must be systematically carried out according to an organized plan.
- The search for physical evidence must extend to the autopsy room of a deceased victim where the medical examiner or coroner will carefully examine the victim to establish a cause and manner of death.
 - Tissues and organs will be retained for pathological and toxicological examination, and the body will be searched for evidence that will be sent to the crime lab for examination.
 - Some of the items that may be removed at autopsy are:
 - * Victim's clothing
 - * Fingernail scrapings
 - * Head and pubic hairs
 - * Blood (for DNA typing purposes)
 - * Vaginal, anal, and oral swabs (in sex related crimes)
 - * Recovered bullets from the body
 - * Hand swabs from shooting victims (for gunshot residue analysis)

- **Mobile crime labs** carry all the necessary supplies to protect the crime scene and to photograph it and collect and package evidence. Latent fingerprint development supplies are also in the mobile crime lab. However, the name “mobile crime lab” is a misnomer, since it does not carry out the functions of a crime lab, only carry the supplies for crime scene searches.

○ **COLLECT & PACKAGE PHYSICAL EVIDENCE**

- Care must be taken to handle and package evidence so that no changes take place in the evidence in the time from when it is collected to the time it is received at the lab.
- Whenever possible, evidence should be kept in the original condition found at the crime site and submitted to the lab intact. If evidence is sticking to large structures, such as a wall, the section containing the evidence could be cut out and transported to the lab.
- ***Each different item or similar items collected at different locations must be placed in separate containers. Packaging evidence separately prevents damage through contact and prevents cross-contamination.***
- Evidence-collection technicians use a kit that contains a variety of packaging materials and tools.
 - Metal or plastic forceps may have to be used to pick up small items.
 - Plastic pill bottles with lids are preferred containers for hairs, glass, fibers, and other kinds of trace evidence.
 - Manila envelopes with sealed corners (NOT ordinary mailing envelopes), screw-cap glass vials, or cardboard pillboxes are also adequate containers for trace evidence.
 - A sheet of paper folded in a “druggist fold” can be used to package small amounts of trace evidence.



- There are two frequent finds at crime scenes warrant special attention and must be packaged with care.
 - Bloodstained materials must be packaged in wrapping paper, manila envelopes, or paper bags to prevent the growth of mold which can destroy the evidential value of the blood. Air must be able to flow around the evidence to prevent moisture buildup.
 - Charred debris from a fire must be sealed in an airtight container, such as new metal paint cans, to prevent any volatile petroleum residues from evaporating. This could be evidence of arson.

○ **MAINTAIN A CHAIN OF CUSTODY**

- **Chain of Custody** —*A list of all persons who came into possession of an item of evidence.*
- If evidence is to be presented in court as an exhibit, a continuity of possession or a chain of custody, must be established.
- In order for the evidence to be admissible in court, standard procedures in recording the location of evidence, marking it for identification, and properly completing evidence submission forms for laboratory analysis must be adhered to.
- Every person who handles or examines the evidence and where it is at all times must be accounted for. An example of a form used to document the chain of custody is shown at the right.
- Every item of evidence should be carefully packaged and marked with an evidence tag at the crime scene. When possible, identification marks should be made on the evidence itself, such as the collectors initials and date of collection. If not possible, the item is tagged.
- At minimum, the evidence should be tagged with the collector’s initials, date of collection, and location of the evidence.

EVIDENCE	
Submitting Agency	_____
Date Collected	_____ Time _____
Item #	Case # _____
Collected By	_____
Description of Evidence	_____
Location Where Collected	_____
Type of Offense	_____
CHAIN OF CUSTODY	
Rec. From	By _____
Date	Time _____
Rec. From	By _____
Date	Time _____
Rec. From	By _____
Date	Time _____

○ **OBTAIN STANDARD & REFERENCE SAMPLES**

- When any type of evidence is examined, it must be compared to a known reference/standard sample.
- **Standard/Reference Sample** —*Physical evidence whose origin is known, such as blood or hair from a suspect, that can be compared to crime-scene evidence.*
- The standard/reference samples are obtained from the victim, family members, any paramedics/police officers who may have been in the crime scene, suspects, and other known sources.
- When there is bloodstained evidence, a whole blood (withdrawn from a vein) or **buccal swab** must be obtained from all crime scene participants.
- Standard/reference samples are also taken from the area around the crime scene itself, and from the area around the residences of any suspects.
- Some samples are also taken from the surfaces upon which evidence is located. These are known as **substrate controls**. These are used to insure that the surface material doesn't interfere with the testing procedure.
- Often crime scene investigators are unaware of the importance of including standard/reference samples and substrate samples, but *these are crucial to the investigation*. The evidence is often meaningless without them.

○ **SUBMIT EVIDENCE TO THE LABORATORY**

- Mail shipment and personal delivery are the methods used to submit the evidence to the lab, depending on the distance between the crime scene and the lab and the urgency of the case.
- The person who delivers the evidence to the lab should be familiar with the case and able to maintain the chain of custody.
- Some evidence cannot be shipped through the U.S. Postal service: some chemicals, live ammunition, explosives.
- Evidence must be packaged carefully in order to prevent breakage or accidental destruction during transportation.
- Evidence submission paperwork should accompany all evidence. These forms include information about the crime and suspect(s), location, and a numbered list of the evidence and sometimes the tests that are requested for each. Each piece of evidence is assigned a number and packaged separately.

● **Crime Scene Safety**

- Some potential health hazards can exist at crime scenes due to the spread of AIDS and hepatitis B. However, there is only a very small chance of contracting these diseases at a crime scene.
- AIDS and hepatitis B are transmitted by the exchange of body fluids, and the normal precautions evidence-collection technicians take to prevent contaminating the crime scene also protect them from these diseases.
- Crime scenes often contain biological specimens of unknown origin, therefore caution and protection must be used at all times.
- OSHA (Occupational Safety and Health Administration) requires all law enforcement personnel who may have contact with body fluids to have inoculations against hepatitis B.
- The International Association for Identification Safety Committee has proposed guidelines to protect investigators at crime scenes containing potentially infectious materials that should be adhered to at all times.
 - Personnel should wear a minimum of latex gloves (double gloved) and protective shoe covers. Liquid repellent coveralls should be used with large areas of contamination.
 - A particle mask/respirator, goggles, or face shield is recommended when potentially infectious dust or mist may be encountered.
 - Personnel should be alert to sharp objects, knives, hypodermic needles, etc.
 - Biohazardous evidence should be packaged to maintain its integrity and labeled appropriately.
 - A red biohazard plastic bag should be used for the disposal of contaminated gloves, clothing, masks, shoe covers, pencils, etc.
 - Note-taking should be done while wearing uncontaminated gloves to prevent the contamination of notebooks, pens, etc.



Biohazard Symbol (red)

- If individual protective equipment becomes contaminated or torn it should be removed immediately. Personnel should then decontaminate/disinfect the potentially contaminated body areas and cover with replacement protective equipment.
- Eating, drinking, gum-chewing, smoking, and the application of makeup are prohibited at crime scenes.
- All nondisposable items (lab coats, towels, etc.) should be placed in a yellow plastic bag labeled “infectious linen” and laundered by a qualified laundry service. Personal clothing that may have been contaminated should be laundered this way and should never be taken home for cleaning.

2-2 Legal Considerations at the Crime Scene

- Any removal of evidence from a crime scene must be in accordance with the Fourth Amendment.

The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

- The Supreme Court has defined circumstances under which a crime scene can be searched without a warrant.
- A warrantless search can be conducted
 - under emergency circumstances (danger to life or limb).
 - if there is immediate danger of the loss or destruction of evidence.
 - if there is probable cause — the search of a person and their immediate property in conjunction with a lawful arrest.
 - with the consent of the involved parties.
- Two cases tested warrantless searches in the Supreme Court.
 - *Mincey v. Arizona* dealt with the legality of a four-day search at a homicide scene. The police officers spent four days searching the scene without a warrant and recovered bullets, drugs, and drug paraphernalia to be used as evidence at the trial. Mincey was convicted, but appealed on the basis that the evidence was illegally seized. Mincey won his appeal since the warrantless search did not meet any of the four circumstances listed above.
 - In the *Michigan v. Tyler* case, a business establishment was destroyed by fire. The police suspected arson but did not immediately search the scene. They did search the scene, without a warrant, several hours after the fire and 4, 7, and 25 days later. Tyler was convicted, but the Court reversed the conviction because no legal warrants were obtained for the three searches that occurred several days after the fire.
- The bottom line: Obtain a search warrant when time and circumstances permit. Do not investigate a scene or remove evidence without a warrant.

