

FOLLOWING THE TRAIL OF

EVIDENCE

FORENSIC KIT



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A large, light gray fingerprint graphic is centered on the page, serving as a background for the main title. The ridges of the fingerprint are clearly visible and flow from the top left towards the bottom right.

CRIME SCENE INVESTIGATION

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CRIME SCENE INVESTIGATION

The primary goals of any crime scene investigator include:

- the examination and documentation of the crime scene *in situ*, which is Latin for *in the original place or situation*
- the identification and recovery of the evidence.

To accomplish these goals, crime scene investigators undertake the following steps on each scene:

- 1. ASSESS:** assessing the scene involves determining a proper course of action. During this step, investigators may make decisions regarding which processing techniques will be employed on the scene and how tasks will be divided.
- 2. OBSERVE:** this step requires investigators to study the scene and make unbiased observations.
- 3. DOCUMENT:** investigators document the scene through notes, photographs, and a sketch.
- 4. SEARCH:** investigators conduct a detailed visual and physical search of the scene.
- 5. COLLECT:** investigators identify, collect, and properly package all evidence.
- 6. ANALYZE:** the scene and evidence may be submitted to processing techniques such as latent print development and presumptive testing.

Assume you have been tasked with processing the crime scene represented in the following photographs. Use the provided mock crime scene photographs to complete the requested tasks.

OBJECTIVES

Students will:

Understand the goals of a crime scene investigation
Learn and apply crime scene processing methodology
Discuss proper contamination prevention techniques

KEY VOCABULARY

In Situ
Transient Evidence
First Responding Officer
Crime Scene Perimeter

ACTIVITY 1

Use the **CRIME SCENE NOTES WORKSHEET** to record your observations about the scene represented in the photographs.

FOR TEACHERS:

It will be necessary to create a case number for this exercise. Case numbers are typically generated by taking the last two numbers of the year and the numerical order in which the case occurs. As an example, the first occurring case of the year 2022 would be expressed as 22-0001.

Please see the **CRIME SCENE FIELD NOTES WORKSHEET KEY** for further information.

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CRIME SCENE FIELD NOTES	CASE NUMBER	PAGE	OF
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OFFENSE	LOCATION
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DATE: _____ **DAY:** _____ **TIME NOTIFIED:** _____

TIME ON SCENE: _____ **REPORTING OFFICER ON SCENE:** _____

TEAM MEMBERS ON SCENE: _____

LEGAL AUTHORITY: _____

PERIMETER ASSESSMENT: _____

TRANSIENT EVIDENCE EVALUATION: _____

BRIEFING FROM FIRST RESPONDING OFFICER: _____

TEMPERATURE, LIGHTING, & WEATHER DATA: _____

REPORTING INVESTIGATOR SIGNATURE	DATE
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2.1 CRIME SCENE INVESTIGATION

Briefing from the first responding officer:

I responded to a 911 call made from the university. The caller, Dr. Wigglesworth, reported that her prizewinning crime-sniffing dog, Barkley, had been stolen from her office. She brought Barkley to work this morning and left him napping in her office while she helped a student. Her office door was closed and locked when she left. When she returned, she found her door wide open and Barkley missing. When I arrived, I noticed a shoe impression in front of the door. In the office, I observed a crowbar, a cell phone, a blue latex glove, a piece of yellow fabric, and a red dog collar with bells. Dr. Wigglesworth reported the collar belonged to Barkley. She also reported that the crowbar, cell phone, glove, and yellow fabric did not belong to her. I also observed what appeared to be small crumbs leading from the collar to the door.

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CRIME SCENE PHOTOGRAPHS



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CRIME SCENE PHOTOGRAPHS

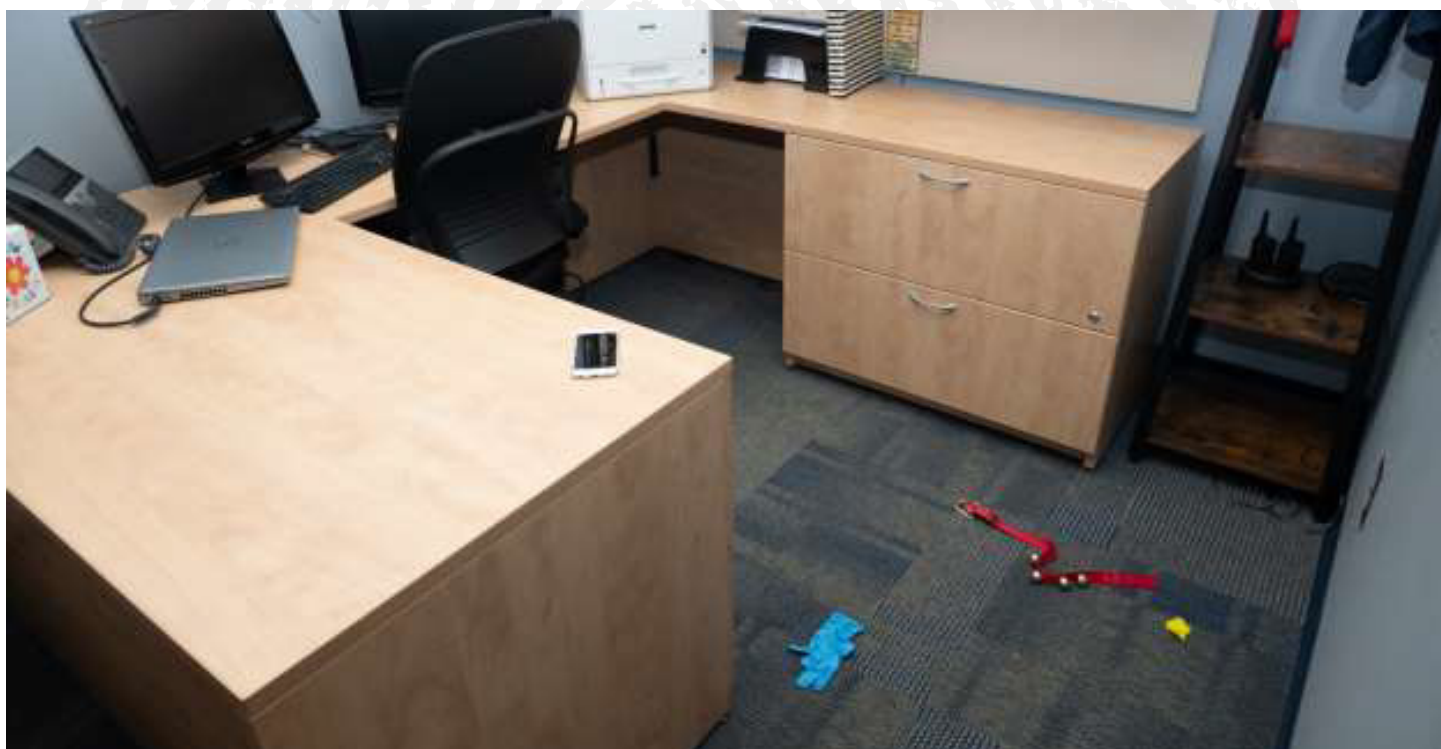


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CRIME SCENE PHOTOGRAPHS



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CRIME SCENE PHOTOGRAPHS



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CRIME SCENE PHOTOGRAPHS

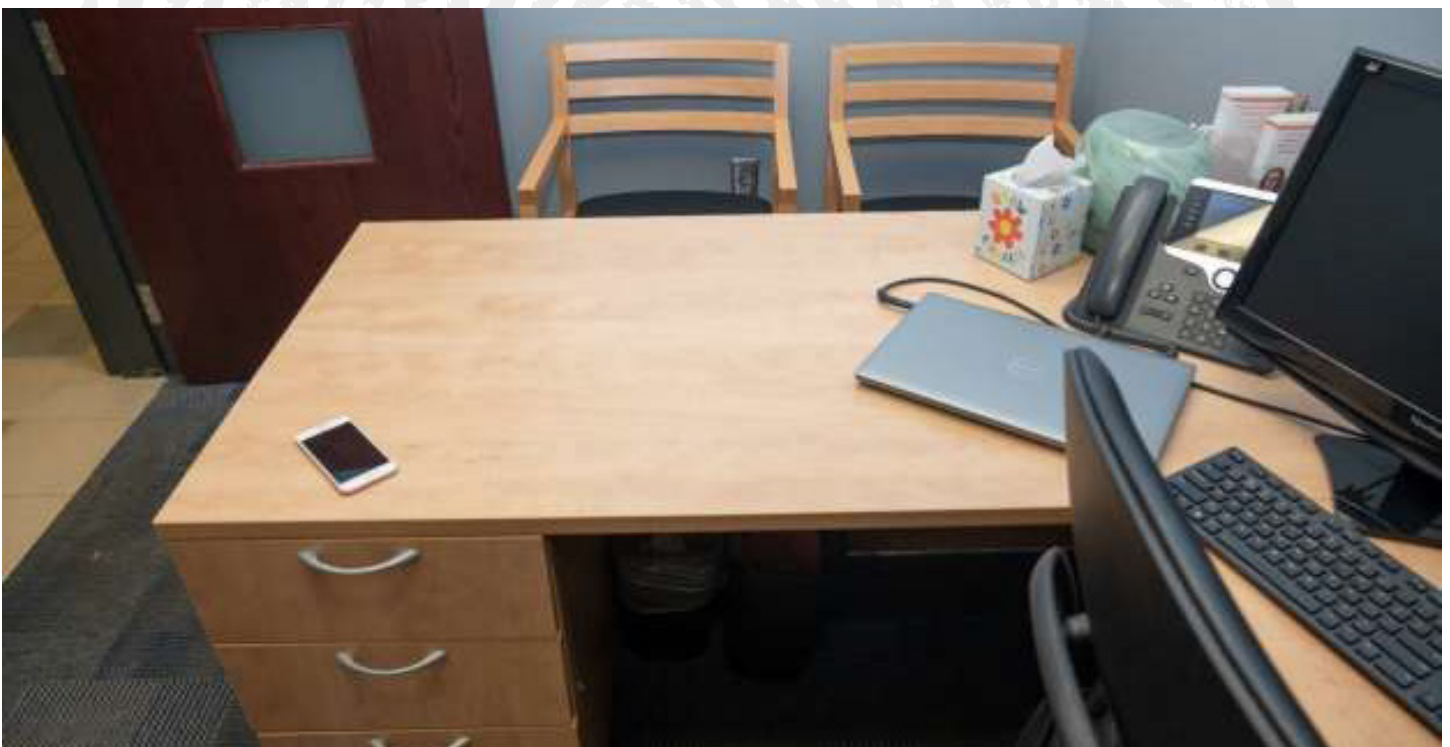


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CRIME SCENE PHOTOGRAPHS

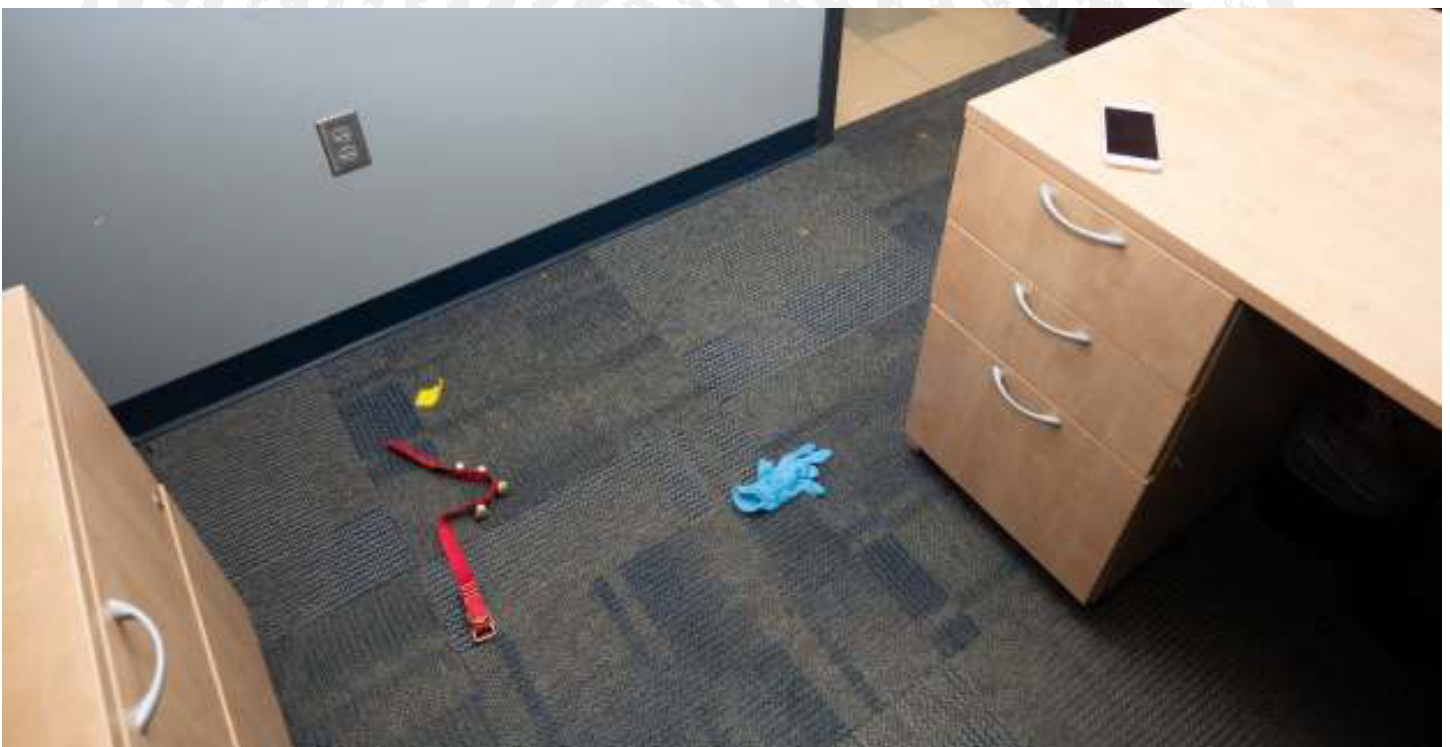


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CRIME SCENE PHOTOGRAPHS



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CRIME SCENE PHOTOGRAPHS



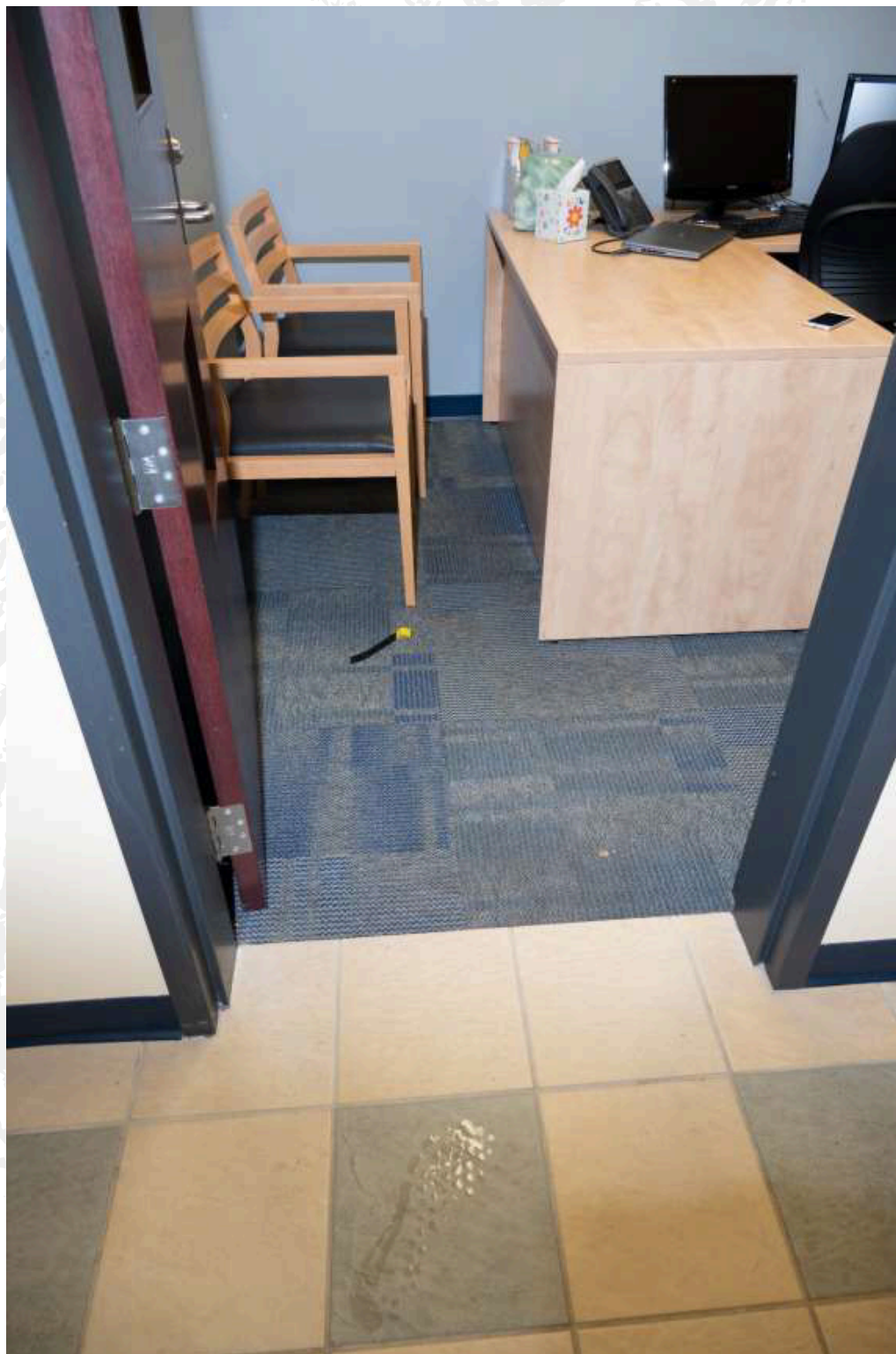
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CRIME SCENE PHOTOGRAPHS



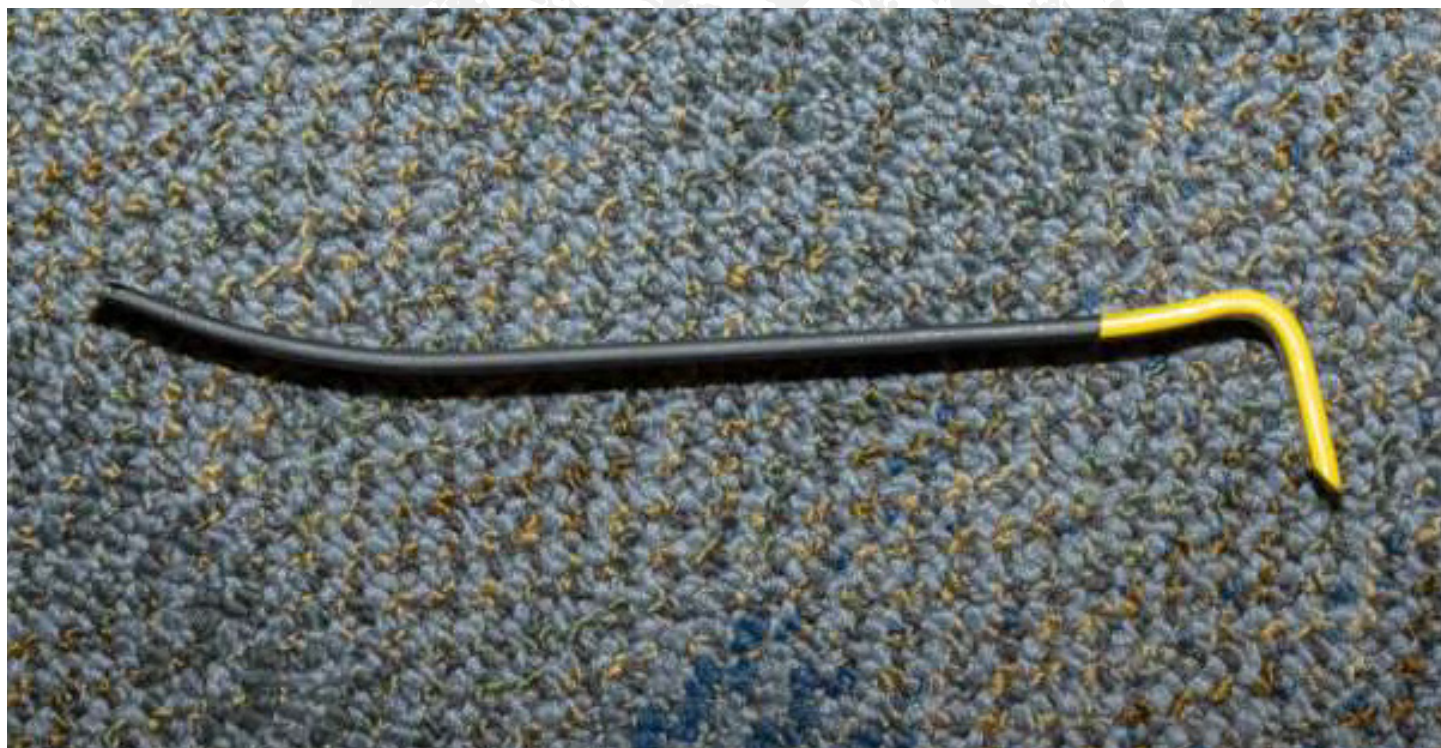
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CRIME SCENE EVIDENCE ANALYSIS AND PACKAGING

One of the single most important tasks on a crime scene is the identification of evidence. The crime scene investigator must evaluate the scene and determine what physical evidence is relevant to the case.

Physical evidence can be anything. *Locard's Principle of Exchange* states that every contact leaves a trace. When a crime occurs, there is an interaction between the victim, suspect, and crime scene. During that interaction there is an exchange of material. The suspect may leave evidence of themselves in the scene or on the victim, and similarly, the suspect may inadvertently take evidence of the victim or scene with them when they leave.

Investigators use this theory to identify evidence and evaluate it for the possibility of future forensic analysis. After identification, the evidence must be documented through the use of notes, photography, and a sketch. Only after all documentation has been completed can the item be collected and packaged.

OBJECTIVES

Students will:

Learn Locard's Principle of Exchange Identify and evaluate physical evidence Learn proper contamination prevention and packaging techniques

MATERIALS

Blank Evidence Recovery Log

ACTIVITY 2

1. Evaluate the scene photographs and identify the items of evidence present in the scene. Assign each item of evidence an item number and record relevant information about each item on the **EVIDENCE RECOVERY LOG**. Leave the packaging method column blank as you will fill it in on ACTIVITY 3.

ACTIVITY 3

1. Review the **BUREAU OF INVESTIGATION EVIDENCE ACCEPTANCE REQUIREMENTS**. For each item of evidence, use the guidelines presented in that document to determine the proper packaging container.
2. For each item, discuss how it should be handled to

prevent contamination.

3. For each item of evidence, discuss the potential for further forensic examinations and analyses.

A. Latent Print Processing

B. Impression Evidence Recovery

C. Serological Testing

D. DNA Collection and Analysis

E. Trace Evidence Collection

F. Firearms & Toolmarks Analysis

G. Identification of Unknown Substances through Chemistry & Toxicology

H. Document Examination

I. Digital Examination

ACTIVITY 4

Choose an item in your classroom and package it using the brown paper bag and tape in your kit.

Make sure to follow proper packaging procedure and include all necessary information on the bag.

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FEDERAL BUREAU OF INVESTIGATION

Evidence Acceptance Requirements

1. All evidence must be packaged in an appropriate container which isolates the evidence and provides protection from damage, loss, or contamination. Common types of packaging include manila envelopes and brown paper sacks of multiple sizes.
2. Each individual item of evidence shall be packaged separately. Two items should not be packaged together.
3. All possible entrances into evidence packages must be sealed with tape. All tape seals must be signed and dated by the individual packaging the item.
4. All items should be packaged in such a way that entering the container after packaging would result in obvious damage or changes to the container and/or seal. For example:
 - A. Bags: The top of the bag shall be folded down twice. The fold shall be narrow enough to be completely covered by a continuous strip of 2-inch tape, such as packing tape.
5. All packages must contain a proper label which includes the following information:
 - A. Case Number
 - B. Item Number and Description of Item
 - C. Date and Time of Collection
 - D. Location of Collection
 - E. Initials of the Individual Collecting the Item
6. Evidence containing a possible source of DNA should never be packaged in plastic. Plastic packaging may promote the growth of moisture and bacteria which may damage DNA.

CRIME SCENE SKETCHING AND MAPPING

Crime scene photographs, although detailed, may not always represent the complete story of the scene. For most indoor crime scenes, it is not possible to photograph the general layout of the scene and evidence from a birds-eye view perspective. In order to accomplish this, investigators must complete a sketch of the scene.

Crime scene sketches must contain the following five (5) elements:

- 1. HEADING:** documentation of why the sketch is being created. For example, a sketch might contain a heading of “Burglary” if the purpose is to sketch a crime scene where a break-in occurred.
- 2. DIAGRAM AREA:** a drawing of the layout of the scene including all relevant features such as entrances, furniture, and evidence.
- 3. LEGEND:** documentation of what the labels in the sketch depict.
- 4. TITLE BLOCK:** administrative information including the date, location, and name of the investigator creating the sketch.
- 5. SCALE DISCLAIMER AND DIRECTION NOTATIONS:** the phrase “Not to Scale” shall be written on each hand-drawn sketch as well as a compass indicating north. As a general rule, sketches should be oriented with north at the top of the page.

After sketching, it is also imperative that investigators take accurate measurements of the scene and evidence. Measurements should define the size of the scene and the location of all critical objects such as evidence. This process is known as mapping. Mapping involves taking measurements so that investigators know the exact location of the item within the scene.

One method used for mapping is known as triangulation. With this method, investigators use fixed reference points within the scene to measure the precise location of items. A fixed reference point is one that cannot be moved such as the corner of a room or the corner of a built-in cabinet. Each item must be measured using two (2) reference points. This is accomplished by measuring the distance from the item of evidence to both reference points.

When mapping, items are categorized as being either regular or irregular. Regular items have a fixed shape that will not change with movement. Irregular items are asymmetrical and the shape may change if they are moved. In the provided example, the regular item is a cell phone, and the irregular item is a jacket.

Items with a regular shape should be measured from a single point on each end to two (2) fixed reference points within the scene. Irregularly shaped objects should be measured from a center point on the object to two (2) fixed reference points. Regular objects will then have four (4) total measurements while irregularly shaped objects will have two (2) total measurements. An example sketch with triangulation measurements has been included with this activity.

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OBJECTIVES

Students will:

Learn and practice the five (5) critical elements required on a crime scene sketch

Understand the difference between sketching and mapping

Practice sketching and the triangulation mapping method

MATERIALS

Blank Grid Paper

Pencil

Measuring Tape

KEY VOCABULARY

Mapping

Triangulation

Reference Point

Regular Shaped Object

Irregular Shaped Object

ACTIVITY 5

Using the photographs as a reference and blank grid paper, sketch the scene. Orient your sketch so that north is located at the top of the page.

1. Draw the perimeter of the scene, including all walls and entrances.
2. Draw all fixed features of the scene such as built-in cabinets and fixtures.
3. Draw all large items such as furniture.
4. Draw each item of evidence and label it with the assigned item number.
5. Create a legend. The legend should include all items of evidence with their assigned item numbers, a description of all reference points, and any large items such as furniture. To avoid confusion with evidence, large items such as furniture should be labeled with letters.
6. Include a heading, title block, scale disclaimer, and a compass.
7. For each item of evidence, illustrate on the sketch the proper way to measure using triangulation. You may accomplish this by using lines to represent your measurements. Identify reference points, label on the sketch, and include in the Legend.

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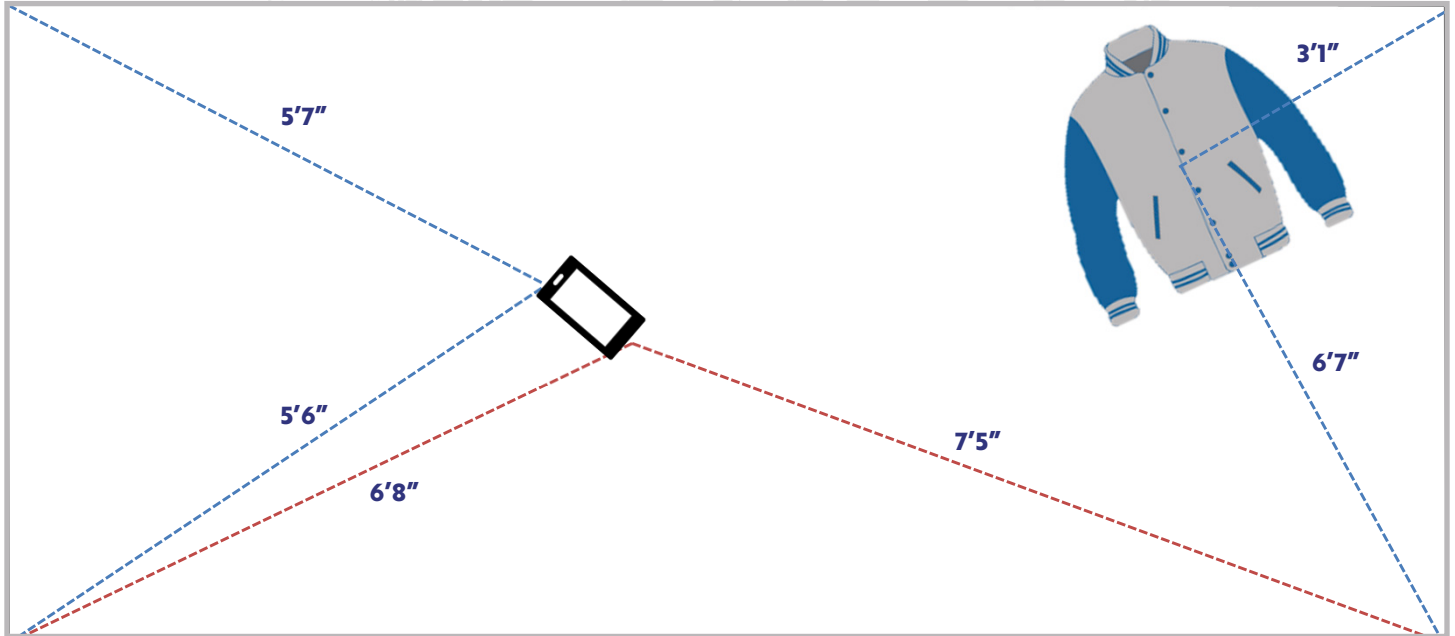
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TRIANGULATION



RP1: NORTHWEST CORNER

RP2: NORTHEAST CORNER



RP3: SOUTHWEST CORNER

RP4: SOUTHEAST CORNER

ITEM NUMBER	DESCRIPTION	DISTANCE FROM RP1	DISTANCE FROM RP2	DISTANCE FROM RP3	DISTANCE FROM RP4
1-A	TOP OF CELL PHONE	5'7"			5'6"
1-B	BOTTOM OF CELL PHONE			7'5"	6'8"
L-2	JACKET		3'1"	6'7"	

DATE _____ CASE NUMBER _____ PAGE _____ OF _____

LOCATION _____ TEAM MEMBERS _____

PREPARER _____

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BUCCAL SWAB COLLECTION

Crime scene investigators are often called upon to collect biological samples. This process involves using a sterile, cotton swab which is rubbed against a surface in an effort to collect biological material such as DNA. A swab collected from a crime scene is defined as an “unknown,” meaning the owner of the DNA collected on the swab is unknown to the investigators. If a suspect is identified on a case where unknown samples have been collected, investigators may seek a search warrant to obtain permission to collect a “known” swab from the suspect. A forensic analyst would then compare the “unknown” and “known” samples.

A “known” DNA sample collected from an individual is referred to as a buccal swab. A buccal swab is a method used to collect DNA from the cells located on the inside of a person’s cheek. Buccal means of or relating to the cheek. Buccal cells are those cells located on the inside of the mouth on the inner cheek.

OBJECTIVES

Students will:

Collect a known DNA sample

Learn about proper contamination prevention techniques

Understand how known DNA is used in forensic investigations

KEY VOCABULARY

Biological

Known Sample

Unknown Sample

Sterile

Buccal

MATERIALS

Sterile cotton swabs

Coin envelope, swab box, or other relevant sterile packaging

1. LEGAL AUTHORITY Verify that legal authority has been granted to collect the buccal swab. **THIS SHOULD BE IN THE FORM OF A SEARCH WARRANT OR SIGNED CONSENT TO SEARCH FORM.**

2. IDENTIFICATION Verify the identity of the individual and take an identifying photograph which includes a clear view of their face.

3. PREPARE Put on a pair of sterile gloves and a mask. Pay careful attention when putting on the gloves and limit contact with the outside portion so as not to contaminate. Sterile gloves and a mask are required to avoid contamination of the swab.

Additionally, all packaging materials should be prepared prior to collection. Prepare the label on the swab packaging. Follow the guidance provided in the previous activity. After you have prepared the packaging, dispose of your used gloves and put on a new pair of sterile gloves.

4. COLLECT Verify that the subject’s mouth is free of contaminants. Open the swab package and handle only by the shaft. Request the subject open their mouth. Place the swab on the inside of their cheek and rub gently for 5-10 seconds.

5. ISOLATE/PACKAGE Immediately place the swab into your prepared container. Seal with tape and sign over all seals.

ACTIVITY 6

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TRACE EVIDENCE COLLECTION AND PACKAGING

Trace evidence is a term used to describe small, sometimes microscopic evidence such as hairs, fibers, glass, paint chips, and soil. This evidence may be present on any surface within the crime scene. Due to the diminutive size of this evidence, it may easily escape from normal packaging. As a result, trace evidence requires additional packaging and extra caution when handling. All trace evidence should first be placed in a paper bindle (inner container) and then packaged in an appropriately sized container such as an envelope (outer container). This method will be explored in this activity.

OBJECTIVES

Students will:

Learn how to identify, collect, and package trace evidence

MATERIALS

Blank Piece of Paper

Tweezers

Envelope

Optional Magnifying Glass

ACTIVITY 7

- 1. PREPARE:** Begin by preparing a paper bindle using the instructions included on the sample page. Include a label. Next, write a label on an envelope to be used for the outer container. The label should include the case number, the date, the investigator's name, the item number, and a description of the item of evidence. (The item number is what would appear in the evidence log.) A search of the classroom. Identify trace evidence. If necessary, use a magnifying glass.
- 3. COLLECT:** Using tweezers, collect the item of trace evidence and place it in the middle square of the pre-folded bindle. Refold the bindle around the evidence.
- 4. PACKAGE:** Carefully place the bindle in the prepared envelope. Seal and initial.

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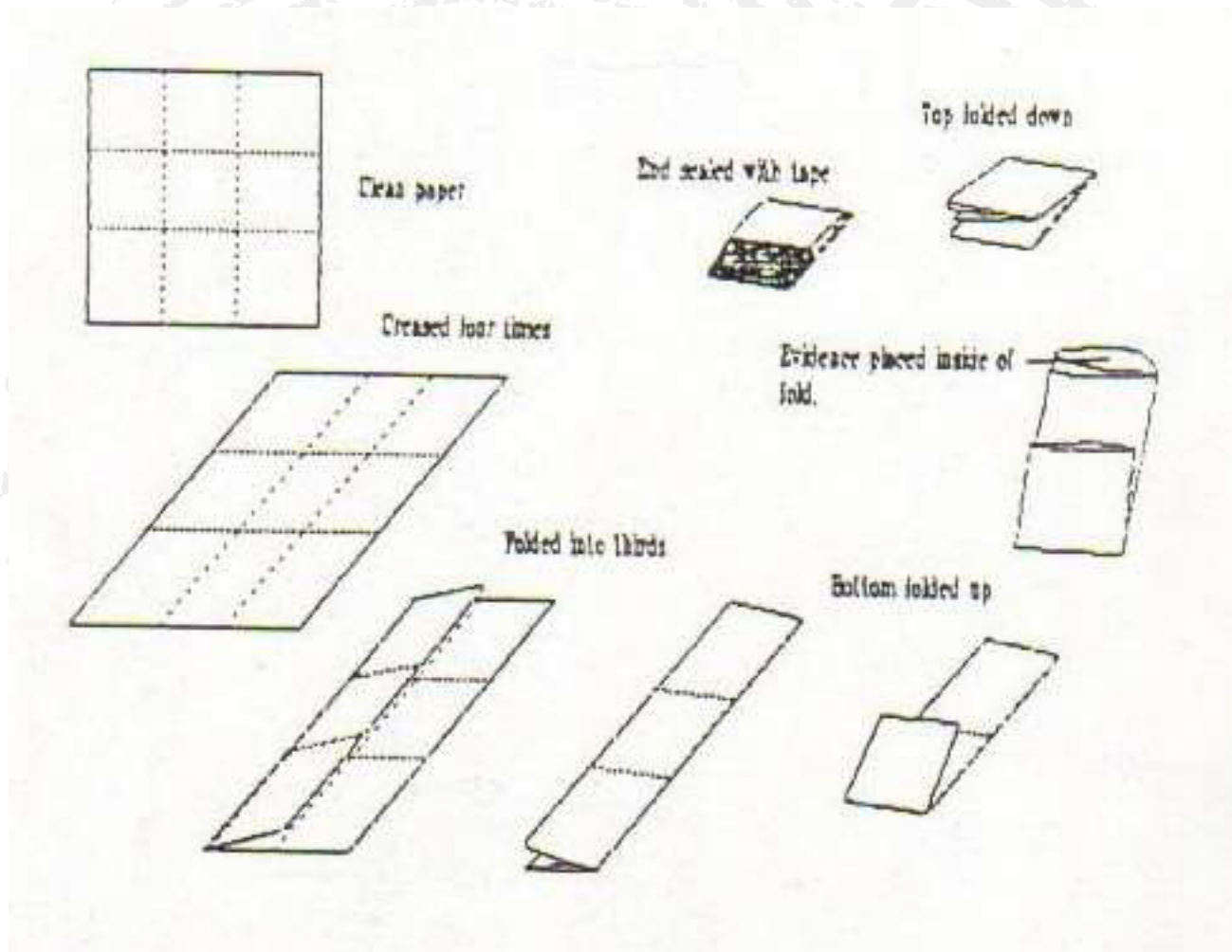


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PAPER BUNDLE/PHARMACY FOLD DIRECTIONS

Paper bundles are:

- Commonly used for storage of trace evidence such as hair, fibers, paint chips, or other minute particles.
- Preferred over plastic containers for trace items that may be moist, carry an electrostatic charge, or require DNA analysis.
- Preferred over envelopes for trace items because they lack manufactured folds, corners, and openings where evidence can be lost.
- Seal a bundle with evidence tape. Do Not staple.
- A sealed bundle should be placed inside an envelope or other suitable container.



4 (Tuck)

**PHARMACY FOLD ENVELOPE
TO PACKAGE EVIDENCE**

1

2

Initials: _____

Date: _____

Item: _____

Case #: _____

3

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CRIME LABORATORY CHAIN OF CUSTODY REPORT

CASE NUMBER _____

ITEM NUMBER		DESCRIPTION OF PROPERTY (one item only):							
DATE OUT	TIME OUT	RELEASED BY NAME/I.D. #	PROPERTY RECEIVED BY NAME/I.D.#	PROPERTY RECEIVED SIGNATURE	DESTINATION (court, prosecutor, lab, etc.)	RETURNED BY NAME/I.D. #	DATE RETURNED	TIME RETURNED	PROPERTY ROOM PERSONNEL SIGNATURE
	AM <input type="checkbox"/> PM <input type="checkbox"/>							AM <input type="checkbox"/> PM <input type="checkbox"/>	
	AM <input type="checkbox"/> PM <input type="checkbox"/>							AM <input type="checkbox"/> PM <input type="checkbox"/>	
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