

**FORENSIC  
SCIENCE**

**INTRODUCTION**  
Crime Scene  
Investigation

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**Forensic Science**

Definition: The application of scientific technology to supply *accurate* and *objective* information reflecting the events that occurred at a crime.

What does a Forensic Scientist DO???

1. Analyze physical evidence
2. Provide Expert Testimony
3. Provide training in the recognition, collection and preservation of physical evidence

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**CORPUS DELICTI**  
"Body of the Crime"

You must prove:


- ↓ that a crime occurred
- ↓ that the person charged with the crime was responsible for the crime

Top Reasons for Committing a Crime

- ↓ Money
- ↓ Revenge
- ↓ Sex
- ↓ Emotion--love, hate, anger

Source of Evidence

- ↓ Body
- ↓ Primary and/or Secondary Crime Scene
- ↓ Suspect(s)



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## 4 Major FEDERAL Crime Labs:

- ☒ FBI
- ☒ Drug Enforcement Administration (DEA)
- ☒ Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF)
- ☒ US Postal Inspection Service

Most states also have their own, smaller crime labs

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## General Crime Lab Services

- ☒ Physical Science Unit
- ☒ Biology Unit
- ☒ Firearms Unit
- ☒ Document Examination Unit
- ☒ Photography Unit
- ☒ Toxicology Unit
- ☒ Latent Fingerprint Unit
- ☒ Pathology Unit

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## Applications of Forensic Science

- ☒ Identification of Criminals or Victims
- ☒ Solving Mysteries
  - ☒ Past crimes (unsolved or wrongfully convicted)
  - ☒ Cause, Location, Time of Death
  - ☒ Paternity cases
- ☒ Cyber crimes
- ☒ Corporate Crimes
- ☒ Voice Analysis

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## Applications of Forensic Science

- ☒ Application of DNA as evidence
- ☒ Prevention vs. Reaction
- ☒ Catastrophes & Wars
  - ☒ ID remains of victims (either civilian or soldiers)
  - ☒ ex. Holocaust or Katrina
- ☒ Military & International Forensics
  - ☒ Terrorism
  - ☒ The search for WMD's
  - ☒ stockpiled or stored weapons from past wars

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## Example: Munitions

When the Army unearthed more than a 1,000 mortar rounds from a WW2 training site, they enlisted a Forensic Science Lab to determine which were live munitions & which were dummies.

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## Ex: The Trial of the Century

- ☒ O.J. Simpson *was* a NFL football legend.
- ☒ He is now famous for having been tried for the murder of ex-wife Nicole Brown Simpson & her friend Ronald Goldman in 1994.
- ☒ He was acquitted in criminal court after a lengthy, highly publicized trial.

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## What went wrong?

- ❑ 1<sup>st</sup> on the scene, police found evidence of blood & entered the Simpson home without a search warrant, an action permissible b/c the situation was an emergency.
- ❑ **HOWEVER**, the police collected a pair of blood-stained gloves during their search.
- ❑ Collection of evidence without proper warrants became the key argument used by Simpson's legal team & ultimately led to his acquittal.

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## What was learned?

- ❑ If forensic evidence is to be admissible in court, the highest professional standards must be used at the crime scene!
- ❑ He was found liable for their deaths in civil court, but has yet to pay the \$33.5 million judgment.

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## Crime Scene Team

*A group of professionals investigators, each trained in a variety of special disciplines.*

### Team Members

- ✦ First Police Officer on the scene
- ✦ Medics (if necessary)
- ✦ Investigator(s)
- ✦ Medical Examiner (if necessary)
- ✦ Photographer and/or Field Evidence Technician
- ✦ Lab Experts
 

pathologist	serologist
DNA expert	toxicologist
forensic odontologist	forensic anthropologist
forensic psychologist	forensic entomologist
firearm examiner	bomb and arson expert
document and handwriting experts	fingerprint expert

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## First Officer at the Scene

- ✦ A Assess the crime scene
- ✦ D Detain the witness
- ✦ A Arrest the perpetrator
- ✦ P Protect the crime scene
- ✦ T Take notes

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## Investigator

- ✦ A specially-trained police officer who is dispatched to a **crime scene** to analyze and document evidence.

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## Field Evidence Tech

Responsible for all aspects of crime scene evidence collection. This may include collecting evidence, documenting evidence, and submitting the evidence to the crime laboratory.

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## Medical Examiner

Medically qualified officer whose duty is to investigate deaths and injuries that occur under unusual or suspicious circumstances and to perform post-mortem examinations.

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## Crime Scene Processing

1. INTERVIEW
2. EXAMINE
3. PHOTOGRAPH
4. SKETCH
5. PROCESS

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## Interview: Eye Witness

“Perception is reality.”

As a result an eye witness may not be the best source of crime scene information.

A police composite may be developed from the witness testimony by a computer program or forensic artist.



Faces Composite Program by InterQuest

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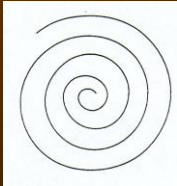
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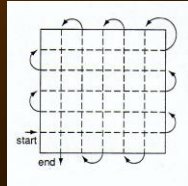
## Examine: Crime Scene Search Patterns

TWO of FOUR PATTERNS

Spiral



Grid



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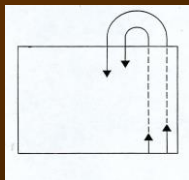
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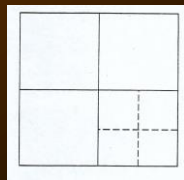
## Examine: Crime Scene Search Patterns

TWO of FOUR PATTERNS

Strip or Line



Quadrant or Zone



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## Photograph

Photography should be used as part of the documentation for all physical crime scenes.

- The scene
- The victims
- The evidence




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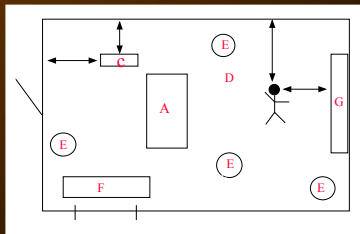


## Sketch

Date: August 14, 2001  
Time: 11:35

Criminalist: Ann Wilson  
Location: 4358 Rockledge Dr, St. Louis, Mo.

- A. Couch/sofa
- B. Female body
- C. Knife
- D. Over turned Lamp
- E. Chairs
- F. Table
- G. Fireplace



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## Crime Scene Mapping

- ↓ Azimuth
- ↓ Triangulation
- ↓ Coordinate or grid
- ↓ Suspended Polar Coordinate
- ↓ Baseline




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## Coordinate or Grid Mapping

Set a north/south line from a point established by a GPS.

Make it a perfect square (4 x 4) by shooting the hypotenuse and setting in stakes every foot or meter.

Measure and map the location of each piece of evidence. Then collect evidence and place in containers by grid.

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## New Mapping Technology

The latest technology includes this Nikon Tsunami with computer. The exact location of all crime evidence can be determined and directly loaded into a computer to produce a crime scene map. Cost = \$35,000 for the set.



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## Process: Physical Evidence



Transient Evidence-  
temporary; easily changed or lost; usually observed by the first officer at the scene

- ☒ Odor
- ☒ Temperature
- ☒ Imprints and indentations
- ☒ Markings

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## Process: Physical Evidence

Pattern or Transfer Evidence-  
produced by direct contact  
between a person and an object  
or between two objects.



- ↓ Biological
- ↓ Chemical
- ↓ Physical
- ↓ Miscellaneous

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<http://www.virtualmuseum.ca/sgc-cms/expositions-exhibitions/detective-investigator/en/game/index.php>

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## Check these out

<https://www.youtube.com/watch?v=ur1GxXZGnNI>

<https://www.youtube.com/watch?v=jcypaqcKesU>

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## Biological Evidence

- ↓ Blood
- ↓ Semen
- ↓ Saliva
- ↓ Sweat/Tears
- ↓ Hair
- ↓ Bone
- ↓ Tissues
- ↓ Urine
- ↓ Feces
- ↓ Animal Material
- ↓ Insects
- ↓ Bacterial/Fungal

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## Chemical Evidence

- ↓ Fibers
- ↓ Glass
- ↓ Soil
- ↓ Gunpowder
- ↓ Metal
- ↓ Mineral
- ↓ Narcotics
- ↓ Drugs
- ↓ Paper
- ↓ Ink
- ↓ Cosmetics
- ↓ Paint
- ↓ Plastic
- ↓ Lubricants
- ↓ Fertilizer

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## Physical (impression)

- ↓ Fingerprints
- ↓ Footprints
- ↓ Shoe prints
- ↓ Handwriting
- ↓ Firearms
- ↓ Printing
- ↓ Number restoration
- ↓ Tire marks
- ↓ Tool marks
- ↓ Typewriting

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## Miscellaneous

- ↓ Laundry marks
- ↓ Voice analysis
- ↓ Polygraph
- ↓ Photography
- ↓ Stress evaluation
- ↓ Psycholinguistic analysis
- ↓ Vehicle identification

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## The Seven S's of Crime Scene Investigation

1. Secure the scene.
2. Separate the witnesses.
3. Scan the scene.
4. See to it that the crime scene examiners receive overall and close up photos with and without measuring rulers.
5. Sketch the scene.
6. Search for evidence.
7. Secure the collected evidence.

Forensic Science: Fundamentals & Investigations, Chapter 2

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