Unit I: Observation and Becoming a Competent Observer
(Essential Questions)

1. What is forensic science?
2. What is observation and what changes occur in the brain?
3. What are some of the factors that influence eyewitness accounts?
4. What is the reliability of eyewitness testimony? How does the reliability of an eyewitness testimony compare with actual events?
5. What does it take to be a good observer? How are these observational skills used in the field of forensic science?
6. What is the difference between indirect and direct evidence? What is the value of indirect and direct evidence in a court of law?
7. What are the types of evidence and how are they classified?
So…how do we define forensics?

“The study and application of science to matters of law.”

- The word forensic is derived from the Latin forensis meaning forum, a public place where, in Roman times, senators and others debated, performed, and held judicial proceedings.
- Includes the business of providing timely, accurate, and thorough information to all levels of decision makers in our criminal justice system.

Forensics vs. Criminalistics

- *Criminalistics*: The scientific examination of physical evidence for legal purposes

- *Criminology*: Includes the psychological angle: studying the crime scene for motive, traits, and behavior that will help to interpret the evidence
Locard’s Exchange Principle

“Wherever he steps, whatever he touches, whatever he leaves, even unconsciously, will serve as a silent witness against him. Not only his fingerprints or his footprints, but his hair, the fibers from his clothes, the glass he breaks, the tool mark he leaves, the paint he scratches, the blood or semen he deposits or collects. All of these and more, bear mute witness against him. This is evidence that does not forget. It is not confused by the excitement of the moment. It is not absent because human witnesses are. It is factual evidence. Physical evidence cannot be wrong, it cannot perjure itself, it cannot be wholly absent. Only human failure to find it, study and understand it, can diminish its value.”—Dr. Edmond Locard

In layman’s terms…

“In layman’s terms…

“Whenever two objects come into contact with each other, there is always a transfer of material”

- Edmond Locard (1877–1966)
  - French professor
  - Considered the father of criminalistics
  - Built the world’s first forensic laboratory in France in 1910
The Locard Principle…

You are currently sitting at your desk. What are you in contact with? What possible transfer of material could have taken or is taking place? Make a list. How could you have prevented any transfer if you had thought about it first? What transferred material could be traced to you directly?

Think about when you came to school today. Did you leave any evidence that you were here other than being observed by others?

Is it difficult not to leave a trace? And, after the fact, is there lots to worry about from leaving evidence of your presence? Do you think premeditated contact can diminish identifiable transfers? Give some hypothetical examples where destroying evidence might leave more that would identify you.
Locard’s Principle is the basis for forensic science, now what is the most important tool in forensic science?

“Whilst part of what we perceive comes through our senses from the objects before us, another part (and it may be the larger part) always comes out of our own mind.”

William James
The Principles of Psychology

The most important tool in forensics is the ability to observe, interpret, and report observations clearly.

Now let’s test out your powers of observation...
How information is processed in the brain.

Perception: Interpreting information received from the senses.

- Our perception is limited and the way we view our surroundings may not actually reflect what is really there. Perception is faulty, it does not always reflect reality.

- ‘There are at least 3 sides to every story; yours, theirs, and the truth.’ (Grissom)
Memory…

Lots of things affect our memory
- Emotions
- Being alone or in a group
- Number of people or animals in the vicinity
- Type of activity going on around you
- How much activity is going on around you
- Our own prejudices, personal beliefs, motives…
- Time

Considering that a key component of any crime investigation is the observations made by witnesses…

- How do perception and memory affect the accuracy of a witness’s observation?
- What affect can this have on an investigation?
- What affect can this have on a trial?
- What affect can this have on a suspect?
- How reliable is an eyewitness account?
How can we improve our skills as an observer?

- Realize that we are not naturally inclined to pay attention to all details
  - Make a conscious effort to examine our environment systematically
- Realize that we are inclined to filter out important information
  - Make a conscious effort to observe everything
- Realize that we naturally interpret what we see to make connections while observing
  - Make a conscious effort to concentrate on gathering the information and interpreting until as much information as possible is gathered.
- Realize that memories are faulty
  - Make a conscious effort to write down or photograph as much information as possible.
Federal Rules of Evidence

In order for evidence to be admissible, it must be:

- **Probative**—actually prove something
- **Material**—address an issue that is relevant to the particular crime

Admissibility of Evidence

**1923 Frye v. United States**
- Scientific evidence is allowed into the courtroom if it is generally accepted by the relevant scientific community. The Frye standard does not offer any guidance on reliability. The evidence is presented in the trial and the jury decides if it can be used.

**1993 Daubert v. Dow**
- Admissibility is determined by:
  - Whether the theory or technique can be tested
  - Whether the science has been offered for peer review
  - Whether the rate of error is acceptable
  - Whether the method at issue enjoys widespread acceptance.
  - Whether the opinion is relevant to the issue
  - The judge decides if the evidence can be entered into the trial.
Facets of Guilt

To prove a case, the “MMO” must be established; it must be shown that the suspect had:

- **Motive**: person had a reason to do the crime (not necessary to prove in a court of law)
- **Means**: person had the ability to do the crime
- **Opportunity**: person can be placed at the scene

Types of Evidence

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<th>Direct Evidence (testimonial)</th>
<th>Indirect Evidence (circumstantial/physical)</th>
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| • First hand observation such as eyewitness testimony and police car dashboard cameras; also includes confessions  
  - Limited by the eyewitness themselves  
  - Recall limitations from the first unit  
  - Look at case 2.1 and 2.2 on pages 37-38 in your book |
| Can be used to imply a fact, but does not directly prove it. Circumstantial evidence may provide a link between the crime scene and the suspect.  
  - Is generally more reliable than testimonial evidence  
  - Can prove that a crime has been committed  
  - Can corroborate or refute testimony  
  - Can link a suspect to a victim or a crime scene  
  - Can establish the identity of persons associated with a crime  
  - Can allow reconstruction of events |
Types of Physical Evidence

**Transient evidence** is temporary; easily changed or lost; usually observed by the first officer at the scene.

**Pattern evidence** is produced by direct contact between a person and an object or between two objects.

**Conditional evidence** is produced by a specific event or action; important in crime scene reconstruction and in determining the set of circumstances or sequence within a particular event.

**Transfer evidence** is produced by contact between person(s) and object(s), or between person(s) and person(s).

**Associative evidence** is something that may associate a victim or suspect with a scene or with each other; e.g., personal belongings.

Examples of Transient Evidence

- **Odor**—putrefaction, perfume, gasoline, urine, burning, explosives, cigarette or cigar smoke
- **Temperature**—surroundings, car hood, coffee, water in a bathtub, cadaver
- **Imprints and indentations**—footprints, teeth marks in perishable foods, tire marks on certain surfaces
Examples of Pattern Evidence

Pattern evidence—mostly in the form of imprints, indentations, striations, markings, fractures, or deposits

- Blood spatter
- Glass fracture
- Fire burn pattern
- Furniture position
- Projectile trajectory
- Tire marks or skid marks
- Clothing or article distribution
- Gunpowder residue
- Material damage
- Body position
- Toolmarks
- Modus operandi

Examples of Conditional Evidence

Light—headlight, lighting conditions, lights on or off
Smoke—color, direction of travel, density, odor
Fire—color and direction of the flames, speed of spread, temperature and condition of fire
Location—of injuries or wounds, of bloodstains, of the victim’s vehicle, of weapons or cartridge cases, of broken glass

Vehicles—doors locked or unlocked, windows opened or closed, radio off or on, odometer mileage
Body—position and types of wounds; rigor, livor, and algor mortis
Scene—condition of furniture, doors and windows, any disturbance or signs of a struggle
Classification of Evidence by Nature

**Biological**—blood, semen, saliva, sweat, tears, hair, bone, tissues, urine, feces, animal material, insects, bacteria, fungi, botanical material

**Chemical**—fibers, glass, soil, gunpowder, metals, minerals, narcotics, drugs, paper, ink, cosmetics, paint, plastic, lubricants, fertilizer

**Physical**—fingerprints, footprints, shoeprints, handwriting, firearms, tire marks, toolmarks, typewriting

**Miscellaneous**—laundry marks, voice analysis, polygraph, photography, stress evaluation, psycholinguistic analysis, vehicle identification

Evidence Characteristics

**Individual**—can be identified with a particular person or a single source

**Class**—common to a group of objects or persons

Can class evidence ever become individual evidence? How?

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Class vs. Individual Evidence

These fibers are class evidence; there is no way to determine if they came from this garment.

The large piece of glass fits exactly to the bottle; it is individual evidence.

Class or Individual: What do you think?