“You can observe a lot just by watching.”

—Yogi Berra, former New York Yankees catcher and sage
Objectives

You will understand:
- The value of indirect and direct evidence in a court of law.
- That eyewitness accounts have limitations.
- What physical evidence can and cannot prove in court.
- That the forensic scientist’s main goal is to find a unique source for the evidence.

You will be able to:
- Explain the difference between indirect and direct evidence.
- Describe what is meant by physical evidence and give examples.
- Distinguish individual evidence from class evidence.
- Determine the significance of class evidence.
What is evidence is?
Evidence- Anything that tends to establish or disprove a fact

What are different forms of evidence you can think of?
Classification of Evidence

**Physical evidence:** any tangible items that are relevant in a crime, also called real evidence.

(Examples are hair, fiber, fingerprints, documents, blood, soil, drugs, tool marks, impressions, glass)
Types of Evidence

Direct evidence (testimonial evidence): a statement made under oath by a competent witness. Video footage.

Indirect Evidence (Circumstantial evidence)- Evidence based on suggestion rather than personal knowledge or observation. May not prove something. The more you have, the greater weight it carries. (blonde hair, size-eleven shoe, blood type B)
Difference between direct and indirect evidence

**Direct evidence** does not require any reasoning or inference to arrive at the conclusion to be drawn from the evidence.

**Indirect evidence** (Circumstantial evidence) requires that an inference be made between the evidence and the conclusion to be drawn from it.
So...which one’s direct evidence, and which one’s indirect evidence?

#1 “I heard distant pitter patter, and later walked outside and saw the ground was wet, smelled freshness in the air and felt that the air was moist.”

#2 “I looked outside the window and saw it raining”
Categories of Evidence

• Direct Evidence
  • Proves a direct fact
  • Examples:
    • Eyewitness Testimony
    • Surveillance Video

• Circumstantial Evidence (aka Indirect Evidence)
  • Implies a fact (but does not prove it directly)
  • Most types of evidence fall under this category
  • Physical and Biological Evidence
  • Examples:
    • Hair/Blood/Fingerprints/Documents/Glass/Impressions etc.
Hearsay evidence: testimonial evidence not about what you experienced, but what someone else experienced.
Evidence is admissible in court if it...

- Addresses an issue
- Is reliable
- Is relevant
How to be a Good Observer

Observe systematically—

• Start at one part of a crime scene and run your eyes slowly over every space.

• Slowly look at every part of a piece of evidence.

• Do not assume that later on you will be able to remember everything.
How to be a Good Observer

**Turn off filters**—

- Do not pay attention to only what you think is important.
- On a crime scene you will not know what will turn out to be important.
- **Make a conscious effort to pay attention to all the details in your surroundings.**
How to be a Good Observer

**Interpret Data Later**—

- Do look for patterns and make connections.
- But the more information obtained, the better will be the interpretations.
- Remember that eyewitness accounts and your own thinking can include prejudices.
How to be a Good Observer

**Documentation**—

- It is important to write down and photograph as much information as possible.
- Keep in mind that memory is faulty.
- Remember that our brains tend to automatically fill in gaps in our perceptions.
Are You a Good Eyewitness??

• You will have 30 seconds to look at a picture and study it.

• When time up, I will ask you several questions about the picture.

• Answer the questions on the handout

• When we are done we will find out who would make a good eyewitness!!!
READY?
Questions

1. At what location was the photograph taken?
2. How many cars are pictured?
3. What color are the cars?
4. What types of offices are located in the building?
5. How many small trees are in the picture?
6. The photograph was taken in New York State during which season?
7. How many people are in the photograph?
READY?
Questions

1. What is pictured in Photograph 2?

2. Describe the shape of the object pictured.

3. What are the colors of the object?

4. What color edged the top of the object?

5. Upon what is the object displayed?

6. Describe or sketch the design on the object.

7. What is the approximate size of the object?
READY?
Questions

1. How many people are in Photograph 3?
2. What is the sex of the person in the picture?
3. What is the approximate age of the person in the photograph?
4. What color is the person’s hair?
5. Does the person have long hair or short hair?
6. Does the person have any distinguishing features? Glasses?
7. Can you describe the person’s clothing?
8. Can you describe where the picture was taken?
9. Based on evidence in the photograph, can you form a hypothesis about the person’s occupation?
10. Is it possible to identify the interests of the person based on evidence in the room?
Discussion Questions

1. Did everyone answer all of the questions correctly?
2. Did everyone have the same answers? If not, why?
3. Did you do better with practice?
4. Do you think your observations changed when you were distracted?
5. Would your answers have been good enough to testify in court?
Problems with Testimonial Evidence

“Now that I am off my medications, I would like to retract my testimony.”
The Case of Ronald Cotton Part 1
The Case of Ronald Cotton Part 2
Reliability of Eyewitness

Factors that affect accuracy:
- Nature of the offense and the situation in which the crime is observed
- Length of time between the crime and the interview
- Interviewing technique used by the investigator
- Characteristics of the witness

Additional factors:
- Witness’s prior relationship with the accused
- Any prior identification or failure to identify the defendant
- Any prior identification of a person other than the defendant by the eyewitness
Eyewitness

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

*Faces*—a composite program by InterQuest
Value of Physical Evidence

- Generally more reliable than testimonial
- Can prove that a crime has been committed
- Can corroborate or refute testimony
- Can link a suspect with a victim or with a crime scene
- Can establish the identity of persons associated with a crime
- Can allow reconstruction of events of a crime

As a result of the influences on eyewitness memory, physical evidence becomes critical.
Reconstruction

Physical evidence can be used to answer questions about:

- What took place at a crime scene
- The number of people involved
- The sequence of events

A forensic scientist compares the *questioned* or unknown sample from the crime scene with a sample of *known* origin.
Unknown Sample (Questioned Evidence): Material that has been collected from a known location but is of unknown origin.

Known Sample: Material that comes from a proven or known source.
Types of Evidence

Known? Unknown?
**Control Sample** - sample that is similar to the questioned and known samples and is used to validate the test method and procedure.

- May come from the victim, from the suspect, or from items found at the crime scene.
- A fiber found at the crime scene is most valuable when control fibers are available from the floor mats of the suspect’s vehicle. That way, the *known* or control sample taken from the car can be compared with the *unknown* sample discovered at the crime scene.
- A match either puts the suspect at the scene or the victim in the suspect’s car.
5 Types of Evidence

1) Transient Evidence:

2) Pattern Evidence

3) Conditional Evidence

4) Transfer Evidence

5) Associative Evidence
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 that results in a specific pattern.

- **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

- Fingerprints
- DNA Typing

- Can link a suspect to a crime with certainty
- Has probative value
- Can exonerate innocent suspects
Evidence Characteristics

**Class**—common to a group of objects or persons
- Blood Type, Hair Color, Shoe Size

- The more you have, the stronger the case
- The probabilities can be multiplied together to provide stronger evidence
- Example: Ronald Cotton Case
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.
Residential Burglary Photos

Floor with light on

Floor with oblique lighting
Types of Evidence
Chicago Murderer 10/4/2018

Which examples do you think could be individual evidence?
Forensic Investigations

*Include some or all of these seven major activities:*

1. **Recognition**—the ability to distinguish important evidence from unrelated material
   - Pattern recognition
   - Physical property observation
   - Information analysis
   - Field testing

2. **Preservation** through the collection and proper packaging of evidence
Forensic Investigations, continued

3. **Identification** using scientific testing
   - Physical properties
   - Chemical properties
   - Morphological (structural) properties
   - Biological properties
   - Immunological properties

4. **Comparison** of class characteristics measured against those of known standards or controls; if all measurements are equal, then the two samples may be considered to have come from the same source or origin
Forensic Investigations, continued

5. **Individualization** in demonstrating that the sample is unique, even among members of the same class

6. **Interpretation**—giving meaning to all the information

7. **Reconstruction** of the events in the case
   
   Inductive and deductive logic
   Statistical data
   Pattern analysis
   Results of laboratory analysis
   
FBI Investigation

Read a case investigated by the FBI. Observe the various units of their lab and read the section: “How Did They Do That?”

www.fbi.gov/kids/6th12th/investigates/investigates.htm
Types of Evidence