Evidence and Investigation Study Guide

How do police and investigators solve crimes?

Observations are information gathered through our senses (see, smell, touch, taste, hear)

Inferences are a conclusion about something based on an observation.
Example: Jim observed that there was a broken window in the classroom. The glass was on the inside of the classroom. Jim inferred that the window was broken from the outside of the classroom.

Classify means to arrange things in groups according to similar qualities. Dichotomous keys are an easy way to help to identify things.

Evidence is any bit of information, physical markings or objects that give people a reason to believe something.

Common types of evidence are

-Fingerprints
-Materials and fibers
-Tire tracks
-Animal tracks
-Shoeprints or footprints
-Soil samples
-Hand writing samples
-Witness identification

Fingerprints are a mark left by the tiny ridges of your finger tip. These markings are left by dust or other particles on the oil of your skin.

There are 4 main types of fingerprints:

-*The Arch* fingerprint goes from one side of the finger to the other
-*The Whorl* fingerprint has a central circle area with ridges circling around it. The whorl ridges do not go from one side to the other.
-*The Loop* fingerprint begins at one side of the finer, loops around and the ridge ends at the same side of the finger that it began.
-*The Composite* fingerprint is a combination of the whorl, arch or loop together on the finger

Within the fingerprint, there are characteristics that help investigators match up fingerprints. These are **ridge characteristics.** These might include:

- *Forks* (bifurcation): here 1 ridge splits to form 2 ridges
- *A Island:* a short ridge is by itself and not attached to any other ridges
-*A Ridge Ending*: where a ridge just ends

Fingerprints can be lifted off surfaces using powders, brushes and tape. Smooth surfaces are easier to lift prints off than rough surfaces. Some surfaces ar not good for lifting prints off of. Good Surfaces: glass, mirrors, smooth plastic, smooth metal
Bad Surfaces: Bricks, materials, wood

Fingerprints can only be matched if they have a suspect to compare samples to or if the suspect has fingerprints in the database.

Shoeprints can be classified by size, pattern of the print, wear of the pattern.

-Lots of tread on shoe
-Differed tread on toes than on middle and back
-Heavy tread on outside on heel and toe
-Logo in middle of shoe
-Right shoe

When trying to identify specific wear patterns, look for wear on the heel, on the toes, and wear on the treads.

Looking at the Tread on a shoeprint can give investigators an idea of what type of shoe it is.
Example: Hiking shoes- lots of deep tread
Dress shoe- no tread

Looking at the direction of the shoeprints and the depth of the shoe prints can help investigators figure out which direction the person was going. Looking at the spacing between the shoeprints can tell investigators if the person was running (large space) or walking (smaller space).

Running	Walking
-Large space between prints -Deeper prints -Outline may not be as clear (dirt kicked up) -Line of prints are straighter-not as parallel	-Smaller spaces between prints -Shallower prints -Outline clearer -Less of a straight line- more parallel

Animal prints can also be identified based on the pattern left in the soil.

Observation	Inference
-Hoofed animal -2 hooves on foot -4 feet same size	Deer

Tire Tracks can be classified based on
- -Type of tread
- -Size of tread
- -Wear of tread

Fibers and Fabric can be classified based on
- -Color
- -Pattern of weave
- -Texture
- -Strength
- -Flammability

Soil Samples can be classified based on
- -Color
- -pH
- -Smell
- -Make up (composition)
- -Size of particles

Handwriting samples can be compared by looking at
- -The loops in the letters
- -The crosses on the t
- -The spaces between the letters and the words
- -The slant of the letters
- -The size of the letters
- -The dotting of letters (i,j)
- -A combination of writing and printing
- -The pressure on the page

Investigators can also use **chromatography** to compare samples of ink by separating them into the colors that they are made up of.