Labs Start Next week, Jan 20, 2020

Hard bound note book

Black or blue pen

Crime Scene Photography

Required reading Chapters 3

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OFFICE: C246 HEALTH AND LIFE SCIENCES

Lectures Overview (Monday and Today)

Monday

- The crime scene
  - Securing
  - Surveying
  - Searching
- Crime Scene Notes

Thursday

- Photography
- Crime Scene Sketch

Photography

- Photographs taken at a crime scene:
  - 1) Show the layout of the crime scene
  - 2) Show the position of collected and uncollected evidence
  - 3) Show the point of view of victims, suspects, and witnesses
  - 4) Show the original condition of items of evidence at the scene

Film Photography

- Photographic film consists of a sheet of silver halide grains which “expose” in the presence of light.
- Film speed is a measure of the light-gathering capacity of the film.
- Special types of film include Polaroid film and Infrared film

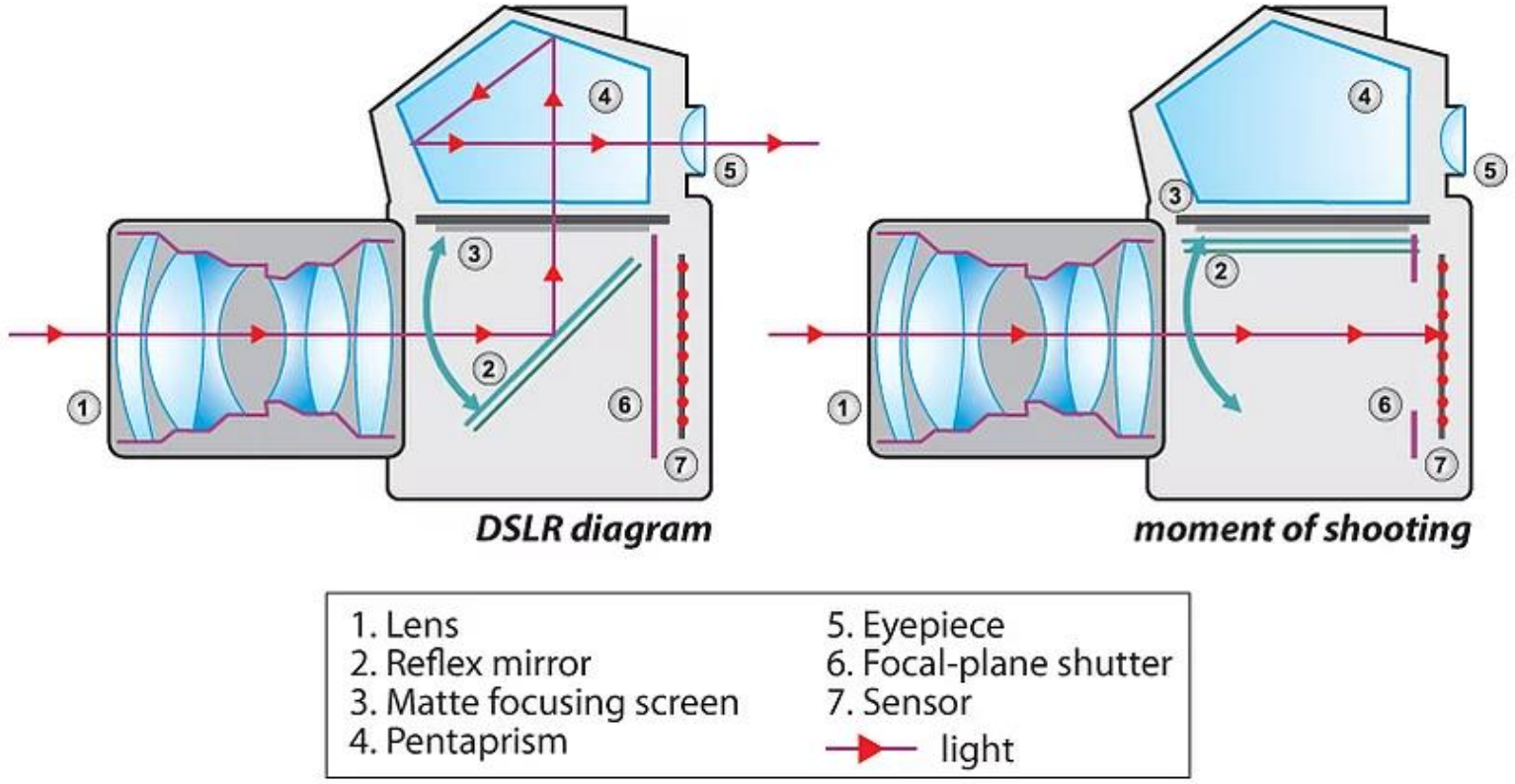
Digital Photography

- A digital photograph is made when a light sensitive microchip captures light on each of millions of tiny picture elements, called pixels.
- The light is recorded on each pixel as a specific electric charge which is read by the camera as image information which is stored as a file on a memory card.
- The number of pixels is directly related to the resolution of the picture. Photographs with more pixels show increasingly good resolution, or more detail and sharpness in photographs.
- The number of pixels that a camera features is usually measured in millions of pixels, or **megapixels**.

Cameras

- The most commonly used camera at crime scenes is the Single Lens Reflex (SLR) camera or the Digital Single Lens Reflex (DSLR) camera.
- SLR and DSLR cameras allow for the use of various accessories such as lenses, flashes, and filters.
  - ❖ SLR and DSLR cameras also allow for manual adjustment of camera settings, such as aperture and shutter speed, that affect image quality.

DSLR Camera



http://dianapinzario.wixsite.com/opticsdslr/single-post/2016/03/01/How-a-DSLR-Camera-Works

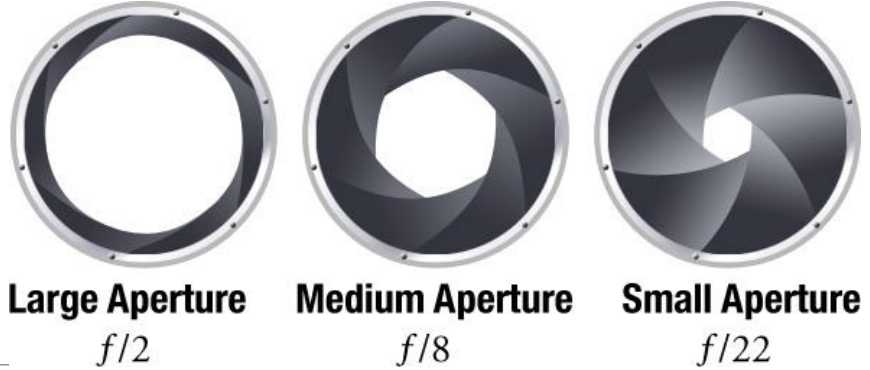
Lenses

- The camera lens bends light to focus an image on the film or digital microchip.
- The lens's focal length, the distance between the lens and the image projected on the film or microchip, determines the area shown in the resulting photograph.
- Normal Lens
  - Focal length of 50-55mm and used for most photographs that need to be taken at a crime scene because it can show as much area as half a wall

Lenses

- Telephoto Lens
  - Focal length of 100 mm or greater and used to magnify images.
- Wide-angle Lens
  - Focal length of 35 mm and used to show much more area in one photograph than a normal lens
- Macro Lens
  - Focal length of less than 50 mm and used for highly-detailed close-up photographs
- Multi-purpose Lens
  - Focal length from 28-80 mm used to take normal, wide-angle, and telephoto photographs

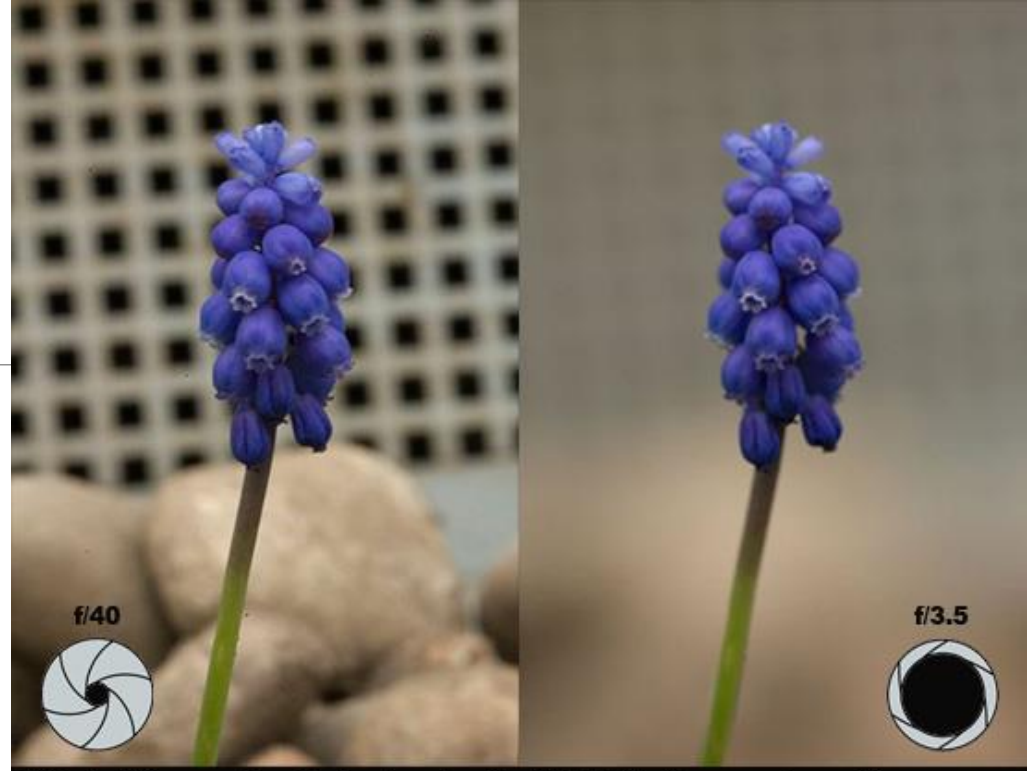
Aperture and Shutter Speed



- The camera aperture is a measure of the diameter of the opening of the diaphragm, which allows light to reach the film or microchip.
- On film or digital cameras, one adjusts the aperture by setting the f-number
  - The lower the f-number setting, the wider the aperture and the more light is allowed in.
- The shutter speed is the length of time that the film or microchip is exposed to light.
- The shutter speed is measured as a fraction of a second by factors of 1/2 (i.e. 1/2, 1/4, 1/8, etc).

Depth of Field

- The depth of field shown in a photograph is the amount of area in the foreground and background of an object in focus that is also relatively in focus.
- The smaller the aperture opening, the greater the depth of field will be. This means that higher f-number settings will yield higher depth of field.



Effect of the aperture (f-stop) on depth of field. A wider aperture will cause shorter depth of field, meaning more blur or soft focus in the frame.

DSLR Modes

- The **“auto mode”** automatically selects an appropriate f-stop and shutter speed for conditions being photographed.
- The **“sports mode”** captures subjects in motion by using a higher (faster) shutter speed.
- The **“night mode,”** uses a lower (slower) shutter speed to gather as much light as possible to create the image.
- The **“landscape mode”** automatically selects higher f-stops to improve depth of field.
- The **“portrait mode”** selects lower f-stops to decrease the depth of field and make the subject stand out clearly against a blurred background.

Surveying the Crime Scene: Photography

- Illumination
  - The light falling on an object
  - Light sources alter an object's illumination
- Factors to Consider
  - Amount of light illuminating an object
  - Angles of illumination
  - Use of flashes/artificial illumination
  - Use of reflectors to direct light
  - Use of filters
  - Tripods

https://www.crime-scene-investigator.net/footwear-and-tire-track-photography.html

Illumination

- Light meters on film or digital cameras allow photographers to measure the amount of light in a shot.
- A flash unit can produce either direct reflective lighting or oblique lighting, which is achieved by positioning the flash at an angle less than 90° to the surface to show detail.

Filters

- Barrier filters block one specific wavelength (color) of light from reaching the film or microchip, making areas of that color appear lighter in the photograph.
- Bypass filters allow only a small range of wavelengths of light to reach the film or microchip and block all others.

Tripods

- Using a tripod to take photographs eliminates the possibility of blurred photos resulting from unsteady hands.
- For crime scene photography, it is useful if the tripod has
  - 1) Independently adjustable legs suitable for uneven terrain
  - 2) A level to ensure 90º images of evidence

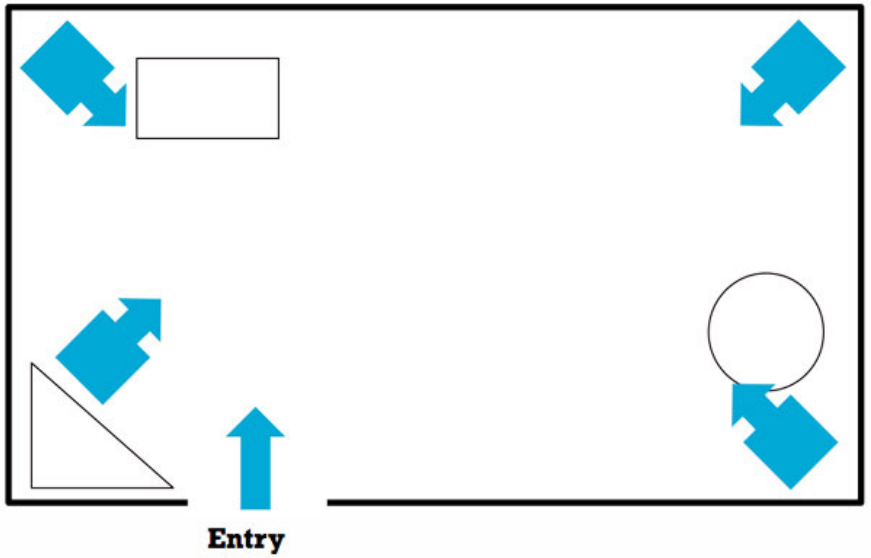
Crime Scene Photography Log

- A detailed log of each photograph taken at the crime scene is kept by the crime scene photographer.
- The top of the photography log form includes
  - case number, type of scene, date, location of scene, description of the camera and lenses being used, film type and speed (if applicable), and the photographer's name and title
- For each photograph, the log records
  - date and time the photograph was taken, the location of the picture, the f-stop and shutter speed settings, the lighting used and the lighting angle (if applicable), and a brief description of the subject of the picture

Crime Scene Photography

- Crime scene photographs should record the area in which the crime actually took place and all adjacent areas where important acts occurred.
- The most important prerequisite for photographing a crime scene is for it to be in unaltered condition.
- Each crime scene should be photographed as completely as possible in a logical succession. The sequence will show the overall scene first, then work down to individual pieces of evidence that jurors in the trial can easily relate back to the larger scene

Crime Scene Photography

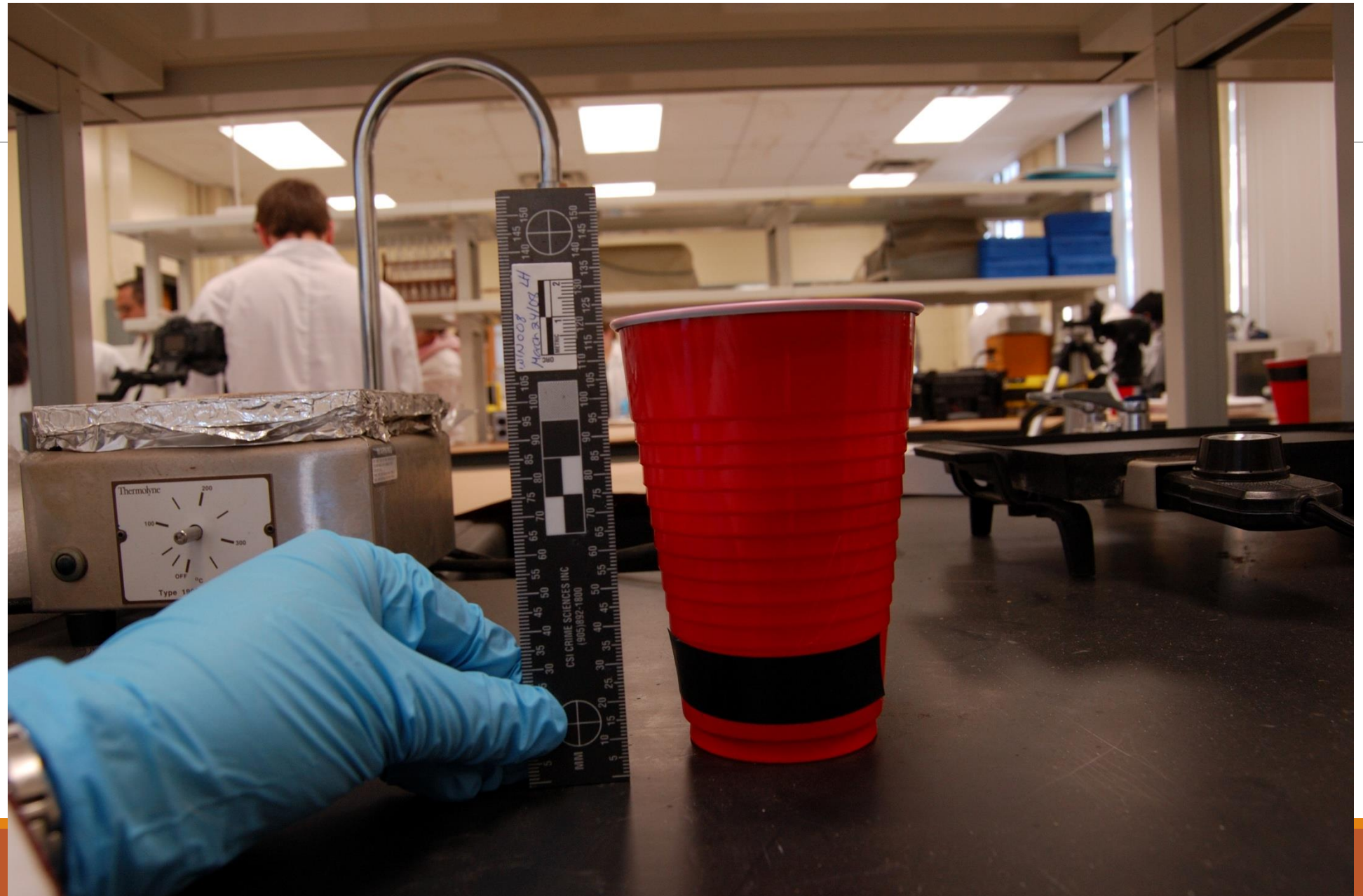


http://www.forensicsciencesimplified.org/photo/why.html

- Overview photographs of the entire scene and surrounding area, including points of exit and entry, are taken first.
  - Taken from the outside borders of the scene and from various angles
  - Include a "visual tag," an object recorded in multiple overview photographs, to help visually piece the scene together
- Medium-range photographs show the layout of smaller significant areas of the crime scene.
  - Include at least one photograph of the "center" of the scene

Crime Scene Photography

- **Close-up** photographs are taken last and show greater detail of individual objects or evidence.
  - Taken at a 90º angle to the object, with and without evidence markers and scales
  - For three-dimensional objects, oblique lighting may be needed to show depth details
- The four minimum photographs required at a crime scene are an overview photograph, a medium range photograph, a close-up photograph, and a close-up photograph with a scale.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(905)892-1800

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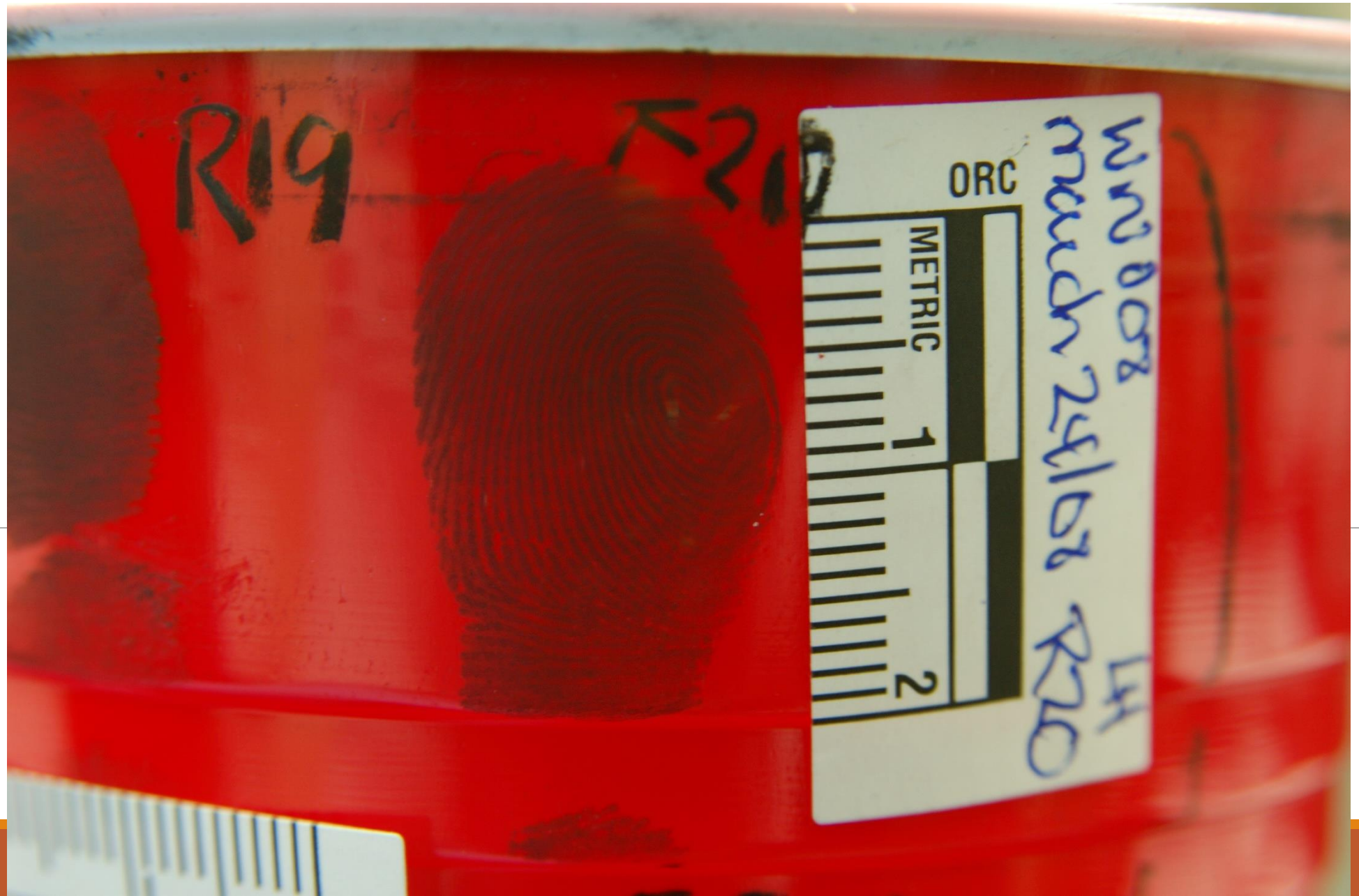
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Special Crime Scene Photography

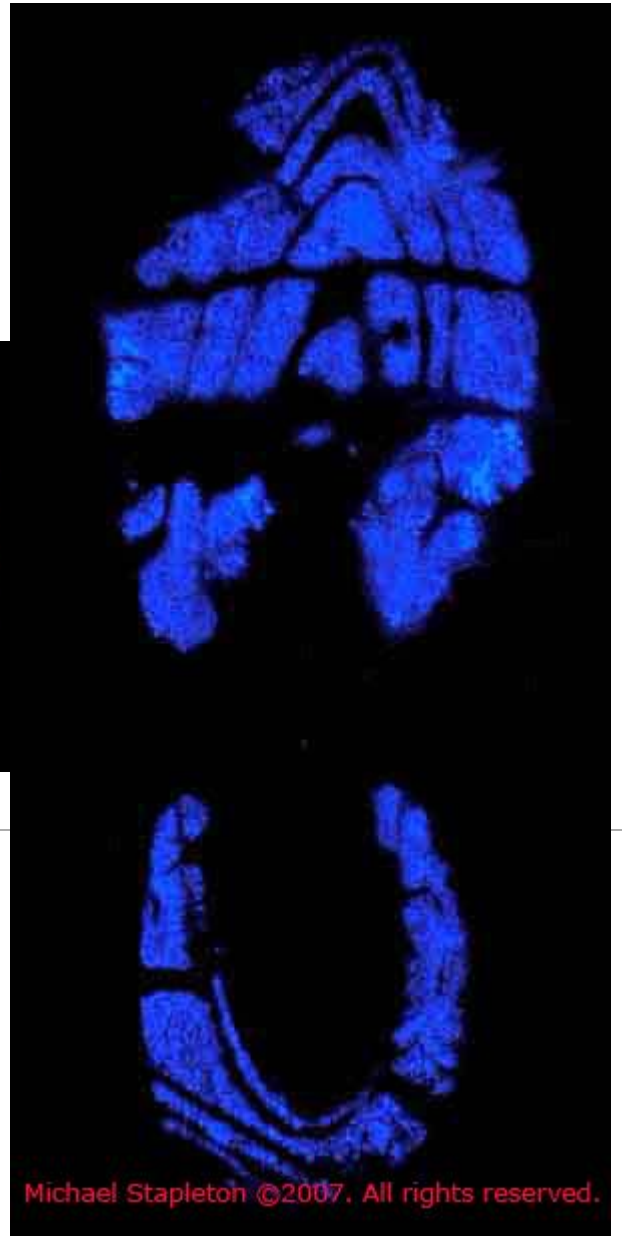
- Night photography – requires the use of external lighting or “painting with light.”
- Indoor photography – requires photographs of the neighborhood, points of entry and exit, and all walls, floors, and ceilings.
- Outdoor photography – requires location of photographs to be recorded by a Global Positioning Device or measurements from landmarks.
- May include aerial photographs

Special Crime Scene Photography

- Arson photography – requires photographs of the point of the fire's origin and use of special equipment or techniques to provide maximum contrast in photographs of charred areas.
  - May also include photographs of crowd outside scene because arsonists commonly return to scene
- Sexual assault photography – requires photographs of all wounds and clothing while showing discretion to the victim.
- Impression photography – requires oblique lighting to show details and a scale to later create a 1:1 scale photograph for comparison to footwear or tire samples.

Special Crime Scene Photography

- Bloodstain photography – requires photographs of all pertinent stains and determined area of convergence or area of origin.
  - Bloodstains treated with luminol photographed in complete darkness
- Latent fingerprint photography – require photographs with a 1:1 scale using a special latent fingerprint camera or a regular camera fitted with an adapter.
  - Black and white film used to show greater contrast


Michael Stapleton ©2007. All rights reserved.

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Digital Crime Scene Photography

Advantages of digital crime scene photography include:

1) The ability to observe images immediately after taking them ensures important photographs are clear and show the best possible detail.
2) The resolution available can exceed 6 megapixels, while the maximum resolution offered by a film SLR camera is equivalent to about 5 megapixels.
3) Computer programs can stitch digital crime scene images together to create a 3-D view of the crime scene.

Digital Crime Scene Photography

Some disadvantages of digital crime scene photography are:

- Digital images are easily manipulated using computer programs and may not show an accurate depiction of the crime scene.
- Digital images may lose image data or details through compression.

Digital Crime Scene Photography

Law enforcement agencies ensure the admissibility of digital crime scene photographs by

1) Developing Standard Operating Procedures that must be followed
2) Saving images to writable (not rewritable) disks by lossless compression
3) Saving enhanced or altered images as separate files
4) Keeping a detailed and accurate photography log
5) Submitting testimony from the crime scene photographer as to the accuracy of the digital images

Videotaping Crime Scenes

- As with still crime scene photography, the crime scene video must include overview, medium-range, and close-up images.
- A narrated crime scene video combines photography and notes.
  - However, it is important that only one person narrates, and no side conversations are captured on the video.
- Some video cameras can produce still photographs, but the quality is often poor.
  - Therefore, still photographs from a film or digital camera are also required.

Sketching the Crime Scene

Crime scene sketches

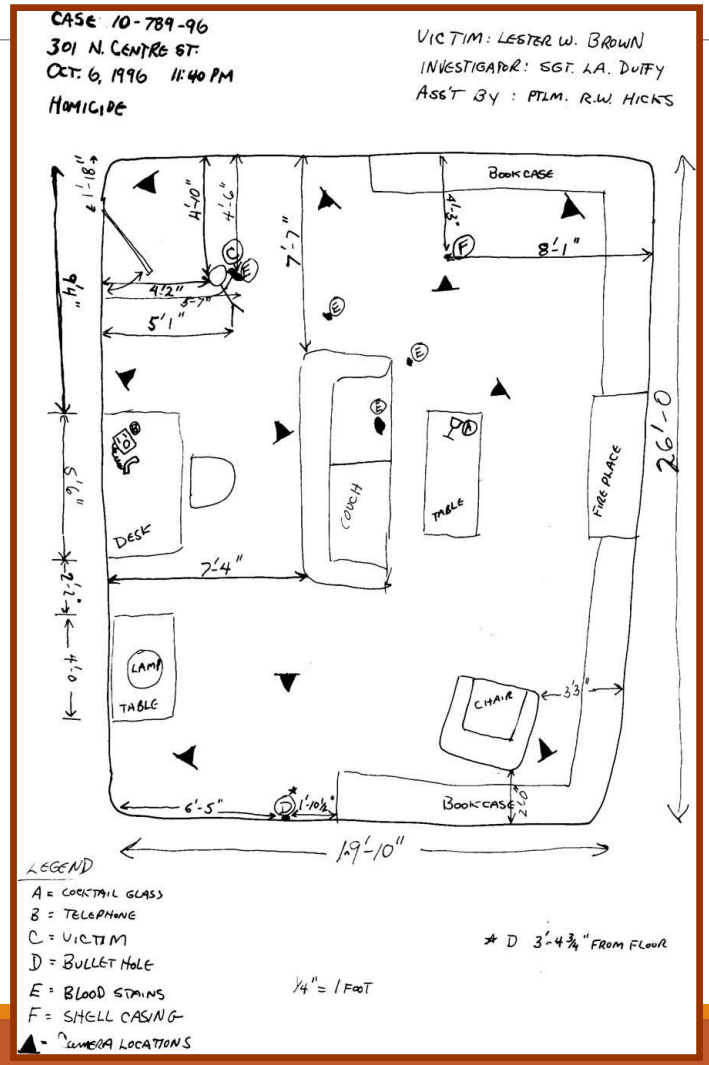
1) Clearly show the layout of a crime scene
2) Illustrate the relationship in space of all significant items and features
3) Clarify objects and features already described in notes or shown in photographs
4) Show measurements over long distances and topography of outdoor scenes
5) Depict possible paths of entry, exit, and movement through the scene
6) Demonstrate whether the account of a victim, suspect, or witness is feasible.

The Rough Crime Scene Sketch

- A rough sketch is created at the crime scene and contains an accurate depiction of the dimensions of the scene and shows the location of all pertinent objects and features.
- All rough sketches include
  - Title block with information on the case, crime scene, and person creating the sketch
  - Legend with identity and dimensions of objects in the sketch
  - Compass showing the North direction
  - Body containing the sketch itself
- Points of reference for objects can be shown by the rectangular, triangulation, baseline, or polar coordinates method.

Surveying the Crime Scene: Rough Sketch

- Dimensions
- Location of all objects
- Location of all recovered physical evidence
- Pertinent Information
  - Case number
  - Artist
  - Scene location
  - Date/Time sketch was created
- Features
  - Legend
  - Compass



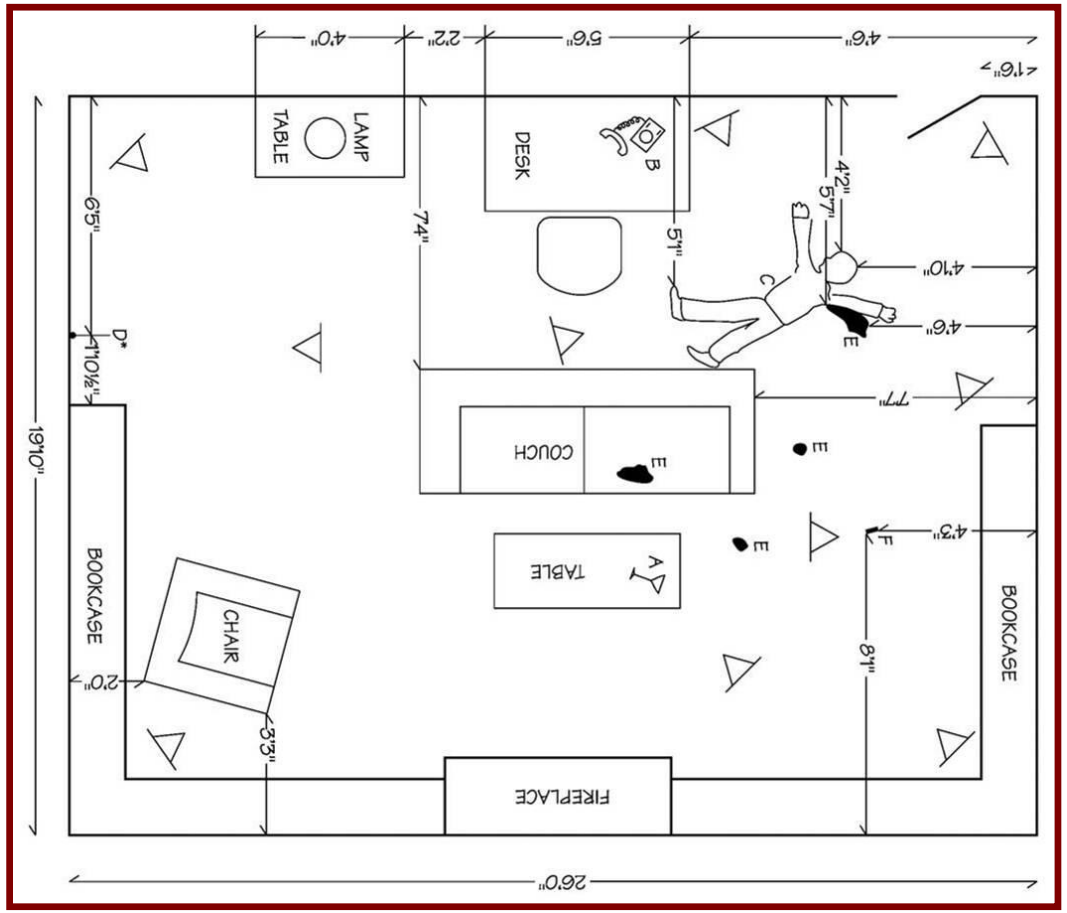
The Finished Crime Scene Sketch

- The **finished sketch** is created from the information in rough sketch, but it is drawn to scale with care and concern for appearance.
- The current standard method utilizes Computer-Aided Drafting (CAD) programs to create the finished sketch.
- CAD programs also allow for the creation of three-dimensional finished sketches.

Surveying the Crime Scene: Finished Sketches

Drawn to scale

Completed by hand in pen or by computer



Summary of Lecture

- DSLR modes
- Surveying the crime scene
- Illumination, filters, tripods
- Photography log
- Minimum for photographs
- Special crime s cene photography
- Advantages and disadvantages of digital photography
- Admissibility of digital crime scene photographs
- Videotaping
- Sketching a crime scene

Note

- Assignment 4 will ONLY be available online January 27 at 8 am to January 31 at 11:59 pm