Notes on Photography Basics

The Negative: How Light Affects Film

- Photographic film consists of a transparent plastic base that holds a light-sensitive emulsion (consisting of gelatin & silver-halide crystals). The gelatin binds the crystals to the plastic base & the silver-halide crystals trap light.

- Light acts like a glue to bind the silver crystals together. Upon exposure to light, these crystals 'clump' together. At first this change is invisible, but during chemical development the silver clumping is converted into a buildup of visible black metallic silver, referred to as *density*. Different proportions of silver density on the film make up the photographic image.

- An important function of the camera is to allow film to be exposed to the correct amount of light. Accurate film exposure results in a negative with a full range of densities: from light to dark. '*Thin negative'* = clear or light, results in shadows. *'Dense negative'* = dark, results in highlights.

- Correct exposure: *A certain amount of light, controlled by the aperture, passes through the camera lens and exposes the film for the amount of time for which the shutter remains open. The correct conjunction of these factors creates a well-exposed negative.*

- Three variables control film exposure: lens opening, shutter speed, and film speed

The Camera Body/Lens:

- "Camera" = the term comes from the *camera obscura* (Latin for 'dark chamber'), an early mechanism for projecting images. The modern camera evolved from this.

- The camera body holds film in a dark place until ready to be exposed to light (stores film)
- It advances film to allow different exposures
- The camera body has a *shutter* (shutter speed)
- May contain a light meter to help determine correct exposure

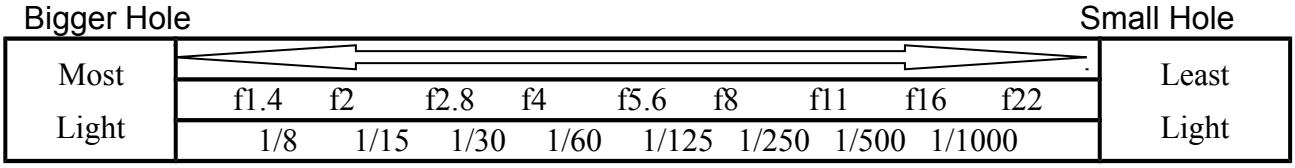
- The lens controls *aperture* (quantity of light reaching the film)
- The lens controls image *focus* (the relative sharpness of the image)
- The lens controls the *depth of field* of the image

Relationships:

- Aperture to shutter-speed (f-stop and shutter speed have a reciprocal relationship)
- Light to duration (time)
- Lens and camera body
- ISO/ASA and light (fast film = more light sensitive, grainier, e.g. 1600). Set your camera to your film speed!!!! (ISO 400 for this class)

Aperture:

- The aperture size is critical to good film exposure
- Light must pass through the lens opening or *aperture* to reach the film. It can be opened wide to allow more light in, or closed down to keep out light. Generally, when photographing in low light, a large aperture is required to allow enough light to reach the film; when photographing in bright light, a smaller aperture is needed to reduce the amount of light reaching the film.
- Quantity of light, depth of field
- F-stops ('f' comes from ratio of focal length & "effective" aperture diameter) *F-Stop is a measurement of the size of the lens opening.*



Each of these numbers let in twice as much light and half as much as the numbers next to it. For example, f5.6 = 2x light as f8 and f5.6 = ½ as much light as f4.

Shutter-speed:

- Controlling Time, Controlling Movement
- The amount of time for which the shutter remains open is critical to the film exposure
- Measured in *parts of a second*. ('500' is really '1/500' of a second).
- The higher the number, the shorter the speed. (250 is ½ as fast as 500)
- The shutter-speed affects how motion is perceived.
    - Lower than 1/60, use a tripod. Hand shake.
    - Blurred motion. Stop motion.

Depth of Field:

- Front to back focus – not side to side
- Depth of field is an artistic choice

CN/C-41 processing: ("color negative") both these labels indicate that film is designed to be processed in a color developer (all dye, no silver) even though it *says* "B&W".

- How to load film, advance film, wind finished film, and unload film
- How to manually focus camera
- How to take and interpret an exposure reading with your light meter
- What does a "good exposure" mean?
- How to manually adjust the aperture and shutter-speed on your camera
- How to successfully compose your shot?
- How to "see" in black and white?

Each combination would yield the <u>same exposure</u>:

shutter-speed	1/1000	1/500	1/250	1/125	1/60	1/30	1/15	1/8
aperture	F2	F2.8	F4	F5.6	F8	F11	F16	F22

8 pictures, shot one after another, of the same subject with these 8 different exposures will render 8 negatives of equal density.

If the shutter speed is slowed down (to allow more light to reach the film), the f-stop must be closed down (to let less light strike the film) to make an equivalent exposure.

Therefore, what do these choices mean? This means that as the photographer, you need to make an artistic choice every time you take a photograph (your available choices are limited based on the available light):

- *How much depth of field do I want? (how much foreground and background do I want in focus?)*
- *Is there motion in my subject matter and if so, do I want to freeze or blur the action?*

Light Meters:

Your exposure meter will tell you what shutter-speed and aperture combinations are available given the lighting conditions that you are pointing your camera at (for internal light meters).

<u>Ms. Gross' Light Meter Rant:</u>

"Take a light meter reading every time you take a photo. Otherwise, you will not get a good exposure (you will let too much or too little light into the camera, which will make your negative too dark or too light, which will make your print too dark or too light).

This is not Photoshop! You can't just play around with some settings and compensate for poor exposure after the fact!

When light physically enters your camera and hits your film, silver crystals on the film are exposed. Later, your light-sensitive roll of film will take a bath in a chemical called 'developer' which will react with the film to bind together the exposed silver crystals and turn them into clumps of dark metallic silver.

Your film becomes your negatives and these are brought into the darkroom and the light from your enlarger passes through the negative, but is partially blocked by the areas of developed silver and this makes your print.

This is a chemical process and it all starts with your initial exposure to light. How much light and for how long determines a good exposure every time you take a photograph!

How much light is your aperture and for how long is your shutter-speed and this relationship is determined by your interpretation of your light meter reading.

Long story short: Take a light meter reading every time you take a photo or you are just using your SLR like a point-and-shoot (auto mode, hope-for-the-best mode), not to mention you aren't making any choices about depth-of-field."