



Introduction to Photography

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Introductions:

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Workshop Outline:

Session One – The Camera

Topics:

- Focus Modes
- Metering & Metering Modes
- Exposure: ISO, Shutter Speed, Aperture
- Capturing Motion
- Depth of Field
- Exposure Compensation, Bracketing
- White Balance & White Balance Bracketing
- Camera menus, function buttons, program settings
- Lenses (?)

Workshop Outline:

Topics:

- Image composition and creating more powerful images;
- Understanding & working with light;
- Low light photography;
- Basic digital image workflow;
- Photography resources;
- Creative image display

Photography: Art & Science

A painter's medium is paint;

A potter's medium is clay;

What is the photographer's
medium?

*"I can't draw. I can't paint.
But with my Nikon FM
I'm a helluvan artist!"*

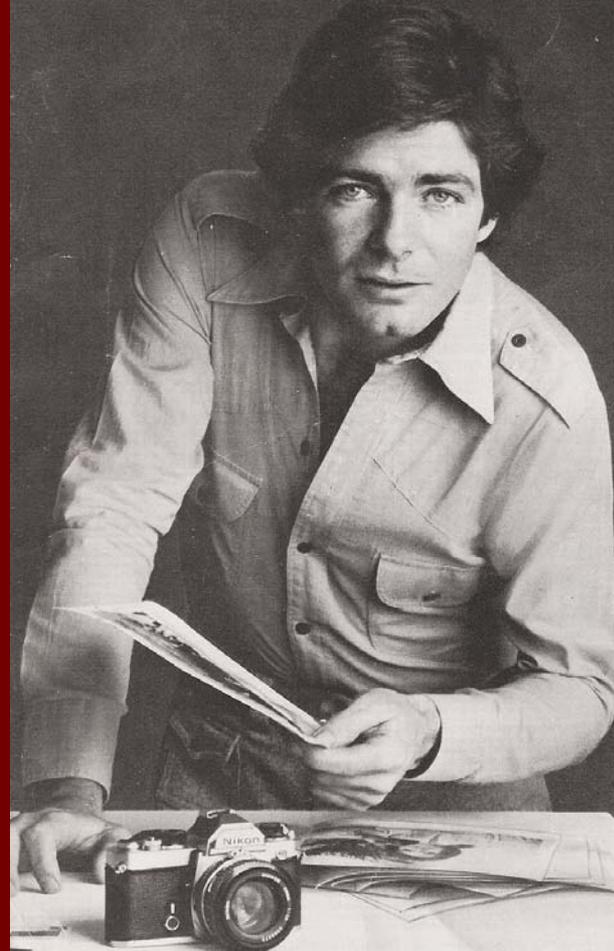
"Photography was invented for people like me. I couldn't draw a line, but I still had the urge to create pictures. I finally decided to do something about it. Namely, get a good camera.

"I wanted a 35mm camera that was small and light, and not complicated. But with enough features that would let me try different kinds of pictures. People, action, flash, long distance—close-ups, too. And, of course, I had to be able to afford it!

"I spoke to a couple of friends who knew about cameras. When they suggested I buy a Nikon, I thought they were kidding. Me! Buy a Nikon! I went to a camera store and explained to the dealer that I was a beginner. He, like my friends, told me that Nikon was the best camera money could buy and that it always pays to start out with the best. He showed me the new Nikon FM—compact, lightweight, and so easy to operate. Then, he really surprised me. He told me that while it didn't cost nearly as much as the professional Nikon F2, it still offered that same Nikon quality. And when I held it in my hands, it felt as if it were made just for me! The other cameras I looked at simply couldn't compare. And, another thing! There is a motor drive and over 55 Nikkor lenses to choose from as I get more involved in photography.

"Now I'm having the time of my life with my Nikon FM. My pictures are extremely sharp, and the colors are true. I'm finally creating pictures I'm proud of. And, I'm just getting started!"

For details on the Nikon FM, check the Yellow Pages for the Nikon dealer nearest you. Ask him also about the traveling Nikon School. Or write for Lit/Pak N-43 to Nikon Inc., Garden City, N.Y. 11530.  Subsidiary of Ehrenreich Photo-Optical Industries, Inc. (In Canada: Anglophoto Ltd., P.Q.)



NIKON FM

CASH REBATES ON NIKKOR LENSES, THRU 4/30/78!
SEE YOUR NIKON DEALER FOR DETAILS.

©Nikon Inc., 1978

Photography: Painting with Light

Photography has been defined as *painting with light*.

As a painter works with paint, a photographer works with light.

A painter may choose from many different types of paint – oils, acrylics, etc. – and chooses the type of paint based on what sort of painting he or she wants to create because each paint offers a different quality.

Light, like paint, can have many different qualities, and the goal of the photographer is to learn how to effectively use these qualities—how to make light interact with a subject so that it speaks; how to use various tools to manipulate and shape the light so that it says what you, as a photographer, want it to say.

Light is the medium, the camera is the tool.

Types of Cameras:

- Compact cameras
- SLR (Single Lens Reflex)
- Rangefinders
- Medium & Large format
- Dual lens
- Pinhole
- Smart phone

Film

vs

Digital

Photography: Playing with Light

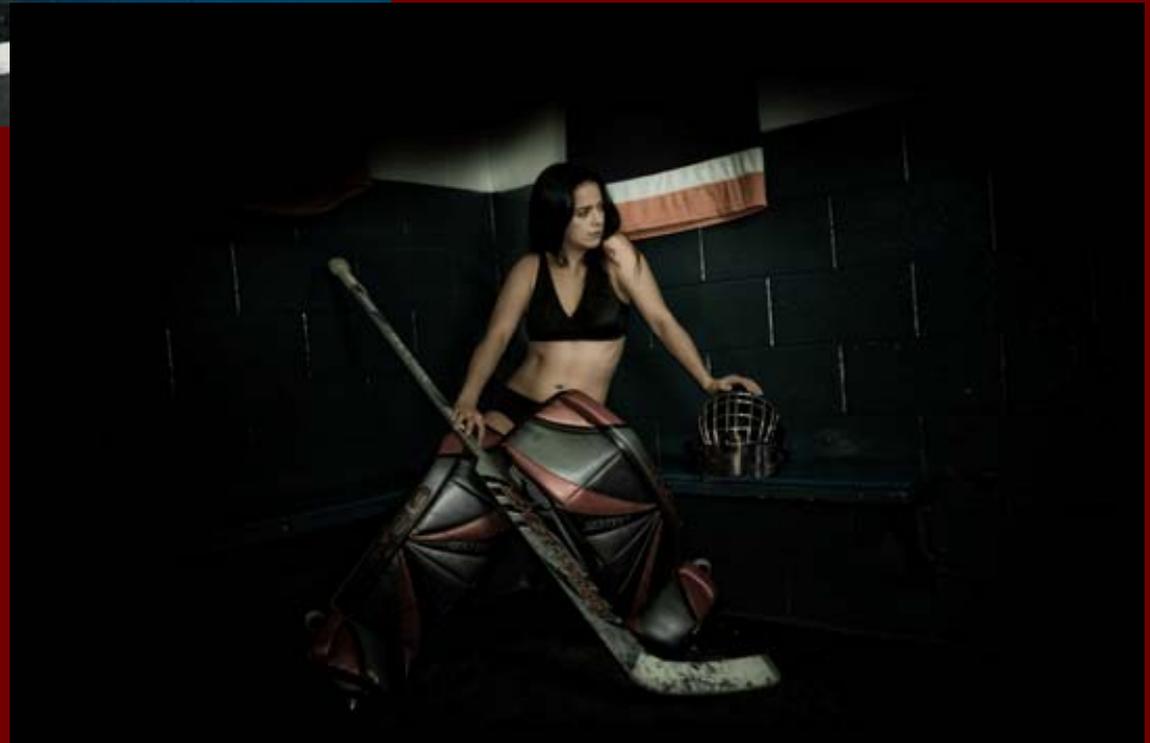
The art of photography involves two distinct, yet equally important processes:

- Photo Capture (taking the picture)
- Photo Development (editing or processing the photo)

Image display could be considered as a fundamental third aspect of photography.







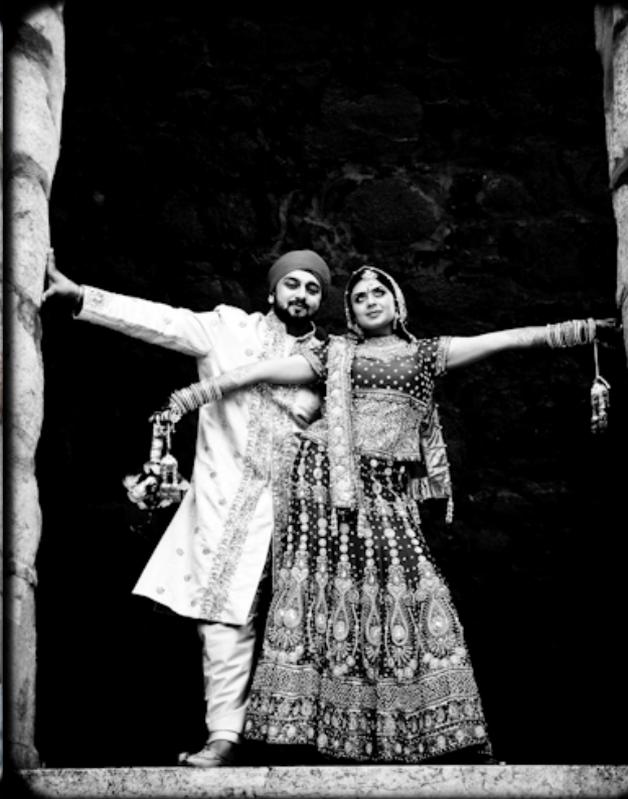










Photo Capture: The Basics

The Camera Basics:

- On/Off
- Camera/Playback/Delete
- Battery
- Card
- Menu & Important Functions
(manual mode, colour modes, file type, etc.)
- Focusing (Auto, Manual, Focus Modes)

Exposure:



Overexposure



Proper Exposure



Underexposure

Exposure:

There may be times when you decide to intentionally over or under expose an image in order to achieve a certain artistic quality in your photograph.

Over-Exposure:



Over-Exposure:



Over-Exposure:



Under-Exposure:



Under-Exposure:

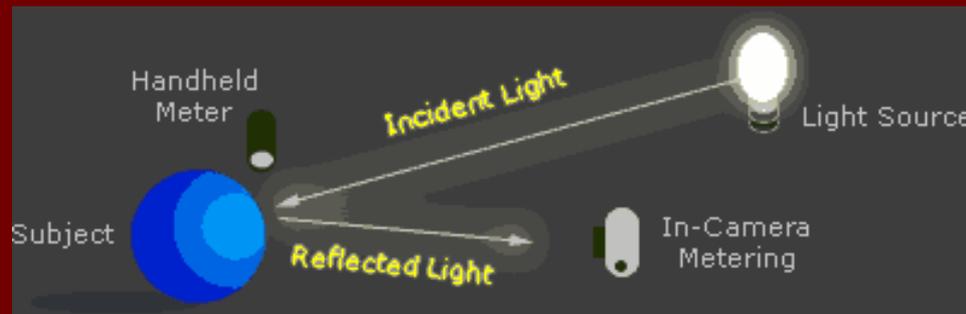


Under-Exposure:



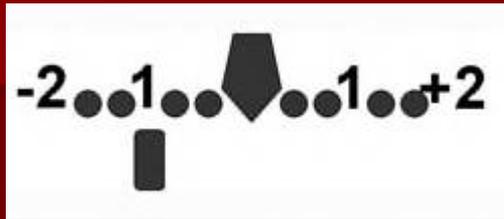
The Camera Meter:

- Metering is the brains behind how your camera determines the shutter speed and aperture, based on lighting conditions and ISO speed.
- Your camera's light meter is the instrument that your camera uses to tell you how it is seeing the light.

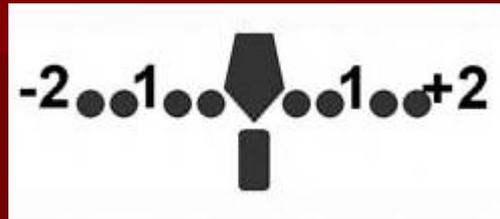


- All in-camera light meters have a fundamental flaw: they can only measure reflected light. This means the best they can do is guess how much light is actually hitting the subject.
- If all objects reflected the same percentage of incident light, this would work just fine, however real-world subjects vary greatly in their reflectance.

The Camera Meter:



Under-Exposure



Proper Exposure



Over-exposure

- Your camera's light meter shows you the amount of light in aperture settings. Each dot on the meter represents a partial "stop", or aperture increment. The numbers represent whole stops. Even though your F-Stop setting controls the aperture itself, the meter readings will also change if you change your film speed or shutter speed.
- Even though most of the time you will want to keep your meter reading in the center, there are times you will need to deliberately overexpose or underexpose your images slightly. Sometimes this is for artistic effect but usually it is because you are shooting in conditions that can confused the meter.

Exposure: Metering Modes

Depending on your camera, you may have a variety of metering modes to choose from:

Matrix Metering

Uses a grid and meters from different cells on the grid; essentially metering from a variety of different points in the shot to get a global reading; Can be thrown off by high contrast

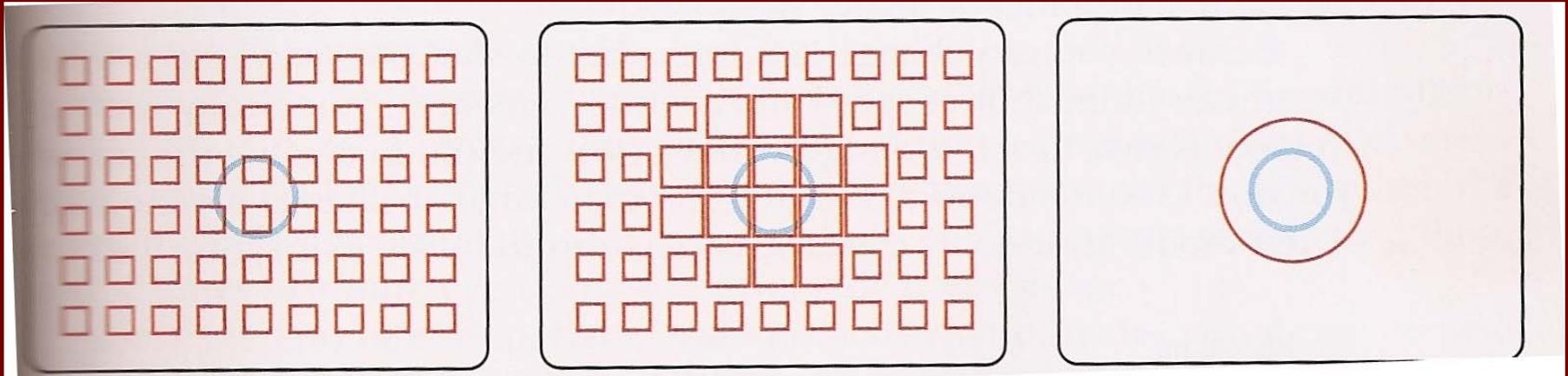
Centre Weighted Metering

Variation of matrix metering that gives preference to cells in the middle of your image; good for extreme lighting or high contrast situations

Spot Metering

Measures only from a small area of your image, usually the centre; good for extremely backlit or extremely dark backgrounds

Exposure: Metering Modes



Matrix

Centre-Weighted

Spot

Metering is usually centre upon your focus point indicator which many cameras will give you the ability to move around the frame.

Exposure:

A camera takes the following factors into consideration when determining proper exposure:

- The amount of light being reflected off of your subject
- The ISO setting of your digital sensor or film
- The shutter speed
- The aperture or F-stop

Exposure: Quantity of Light



The amount of available light you have to illuminate your subject will be key in determining what ISO, shutter speed, and aperture settings you decide to use in order to achieve proper exposure.

A photographer can adjust the amount of available light by introducing artificial sources of light such as flashes.

Exposure: ISO (ASA)



- Film & digital camera sensors are sensitive to light and the ISO setting indicates how sensitive either the film or sensor is.
- Film/sensor with low ISO (25-200) is less sensitive and good for bright lighting conditions, while film/sensor with high ISO (400-6400) is good for lower light conditions.
- The ISO setting of film/sensor will interact with the amount of available light to determine the available combinations of aperture and shutter speeds that will result in proper exposure.
- With ISO, a change of one setting either doubles or halves the sensitivity of the film or camera sensor to light
- ISO is one of the first decisions you make when adjusting your camera for shooting conditions.

Exposure: Shutter Speed



Shutter speed controls the amount of time that your film, or digital sensor, is exposed to light.

Shutter speed is generally measured in seconds and fractions of a second.

A shutter speed of "500" means that the shutter will open for 1/500th of a second.

Shutter speeds of 1 second and longer are generally marked with an ', or other similar mark, after the number.

This means that 5' on your camera's display would stand for 5 seconds.

The letter "B" stands for *bulb* and is often used to indicate the shutter will remain open as long as you hold down the shutter release button.

As with ISO (and aperture), a change of one setting either doubles or halves the amount of light entering the camera.

Exposure: Shutter Speed

"B"ulb 1' 1/2 1/4 1/8 1/15 1/30 1/60 1/125 1/250 1/500 1/5000

Slower

←-----
Lets more light in
Useful for low light conditions
Useful for no flash
Blurs movement

-----> Faster

Lets less light in
Useful with bright light
Useful with flash
Stops or freezes movement

- Shutter speeds of 1/60 or below are considered "SLOW"
- Shutter speeds of 1/500 and higher are considered "FAST"
- Typically, when using speeds of 1/60 or below some form of camera stabilization should be used to prevent camera shake and undesirably blurred images.
- Exposure of 1 second or more are typically referred to as "long exposures"

Shutter Speed & Motion

Faster shutter speeds (1/500 or more) are used to stop or freeze motion.



Shutter Speed & Motion

Slower shutter speeds (1/60 or more) are useful for blurring motion.



Exposure: Aperture

Aperture is an adjustable opening inside the camera lens that works very similar to the iris in your eye.

When the aperture opens wide (like your eye dilating), more light is allowed through the lens to expose the film.

When the aperture is narrow (like your pupil in bright light), less light reaches the film.

Aperture works in conjunction with shutter speed and film speed to determine the total amount of light that reaches the film.

Aperture size also affects depth of field.

Exposure: Aperture

F-Stop Values



Aperture is measured using F-Stops.

F-Stop numbers represent a fractional formula representation of the amount of light allowed to pass through the aperture.

In simpler terms, F-Stop numbers get bigger as the aperture gets smaller, just like shutter speed numbers get bigger as the time the shutter is open gets smaller.

Each increasing F-Stop number roughly represents a halving of the light reaching the film.

Exposure: Aperture

F-Stop Relationship to Light

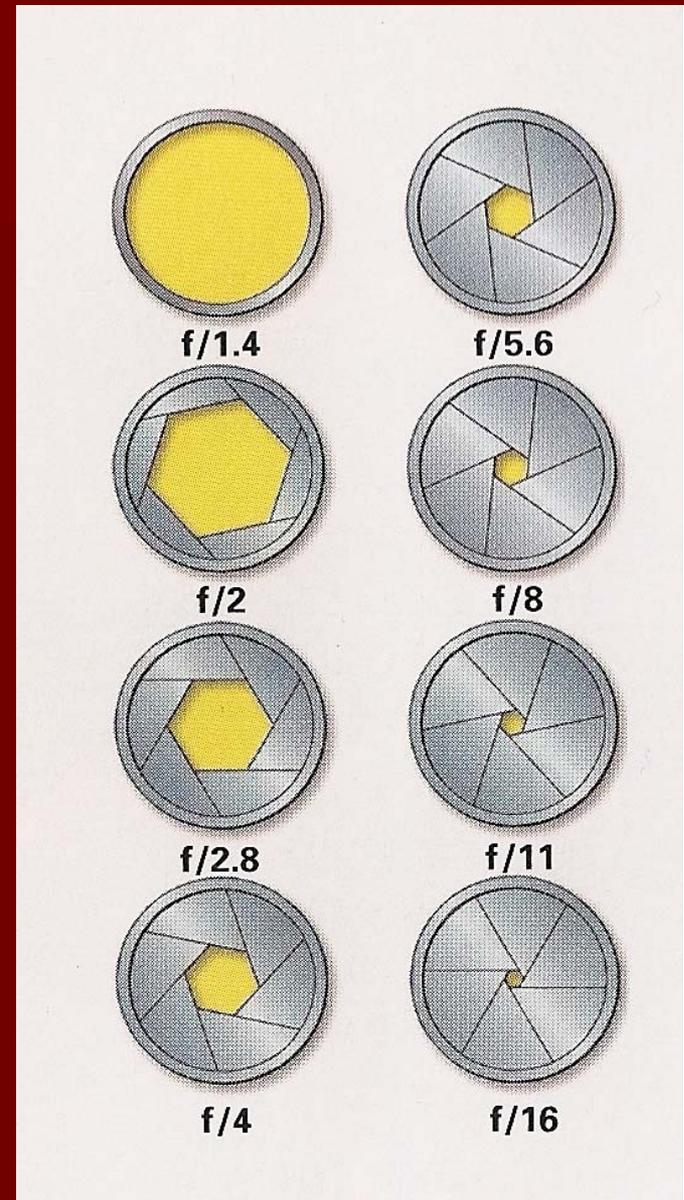
Larger F-Stop Number =
Smaller opening =
Less light coming in

Smaller F-Stop Number =
Larger opening =
More light coming in

Aperture is limited by the capabilities of the lens.

Most consumer lenses have a maximum aperture capability of $f/3.5-4$

Lenses capable of larger apertures ($f/2.8$, $f/1.4$, etc) are called FAST lenses. They tend to be very heavy and very expensive.



Aperture & Depth of Field

Depth of Field is the amount of your image before and beyond your focus point that will be in focus.

Depth of field tells you whether or not your subject and background can be sharply focused at the same time.

Depth of field is determined by several factors:

Aperture/F-Stop

Lens

Subject Distance

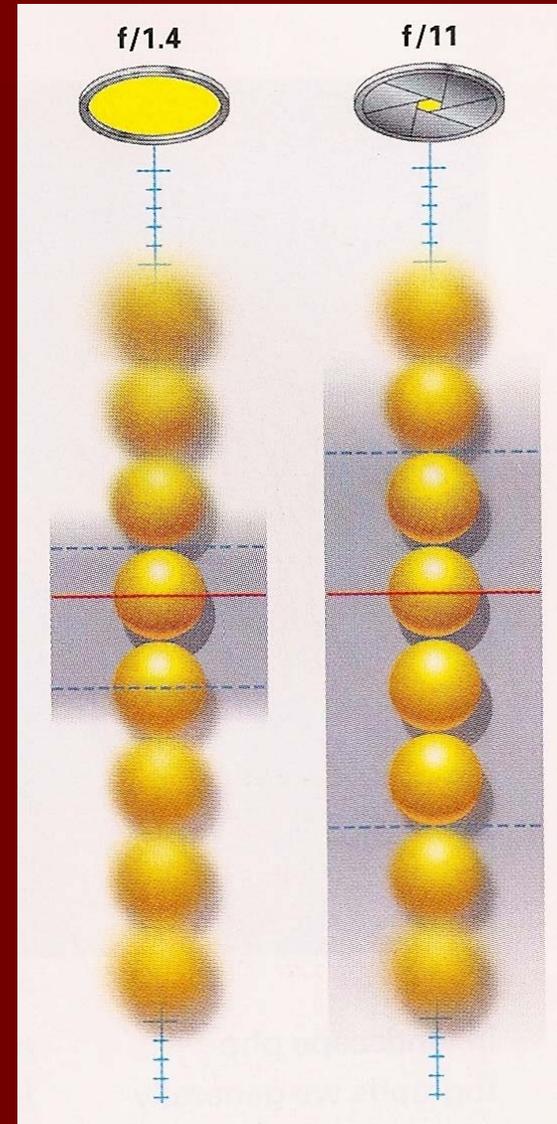
While the camera can actually only focus on one tiny point in space, the depth of field determines how much of the image is in "acceptable focus" to the human eye.

In subjects such as landscapes, a large depth of field is often desired so that the entire scene appears to be in focus. With subjects such as portraits, a small depth of field is often used to blur the background and reduce distractions from the main subject of the image.

Aperture & Depth of Field

The larger the aperture (the smaller the number) the larger the depth of field.

The smaller the aperture (the larger the number) the smaller the depth of field.



Wide/Deep Depth of Field



Wide/Deep Depth of Field



Wide/Deep Depth of Field



Short/Shallow Depth of Field



Short/Shallow Depth of Field



Short/Shallow Depth of Field



Depth of Field:

Depth of Field is also effected by the focal length of the lens.

The longer the focal length, the greater the magnification so the shallower the depth of field.

10mm lens

50mm lens

85mm lens

300mm lens

Larger Depth of Field ←-----→ Smaller Depth of Field

Depth of Field:

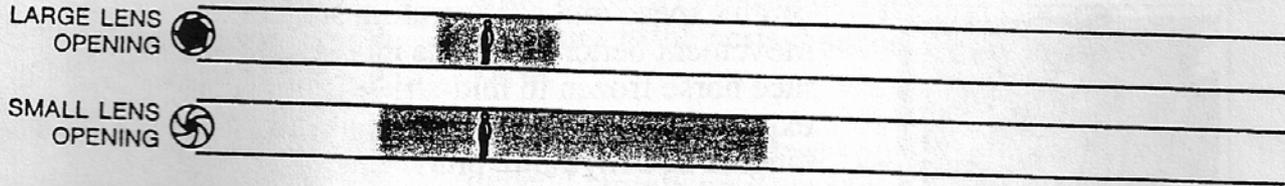
Depth of Field is also effected by subject distance.

The closer you are to your focal point, or subject, the **less** depth of field you'll get.

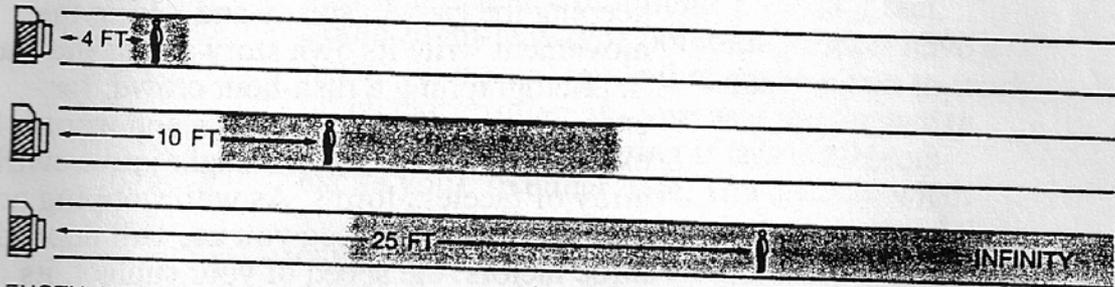
The further you are from your focal point, or subject, the **more** depth of field you'll get.

Depth of Field:

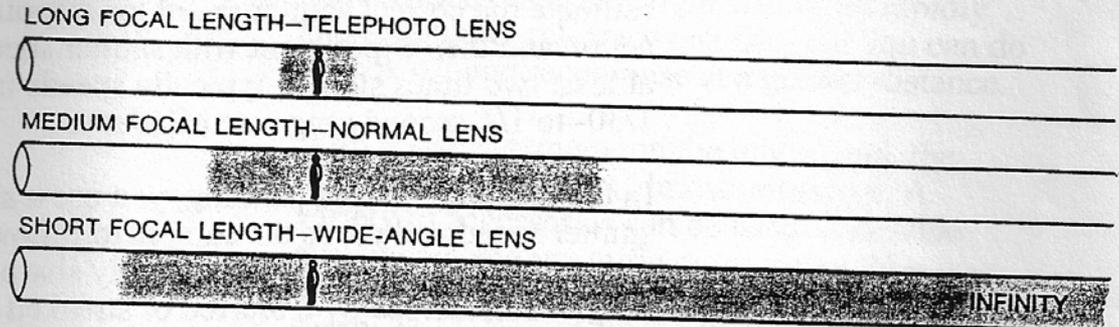
- 1) HOW LENS OPENING AFFECTS DEPTH OF FIELD
Shaded area indicates depth of field—range of acceptably sharp focus.
Same focal length, same subject distance



- 2) HOW SUBJECT DISTANCE AFFECTS DEPTH OF FIELD
Same focal length, same *f*-stop



- 3) HOW FOCAL LENGTH AFFECTS DEPTH OF FIELD
Same *f*-stop, same subject distance

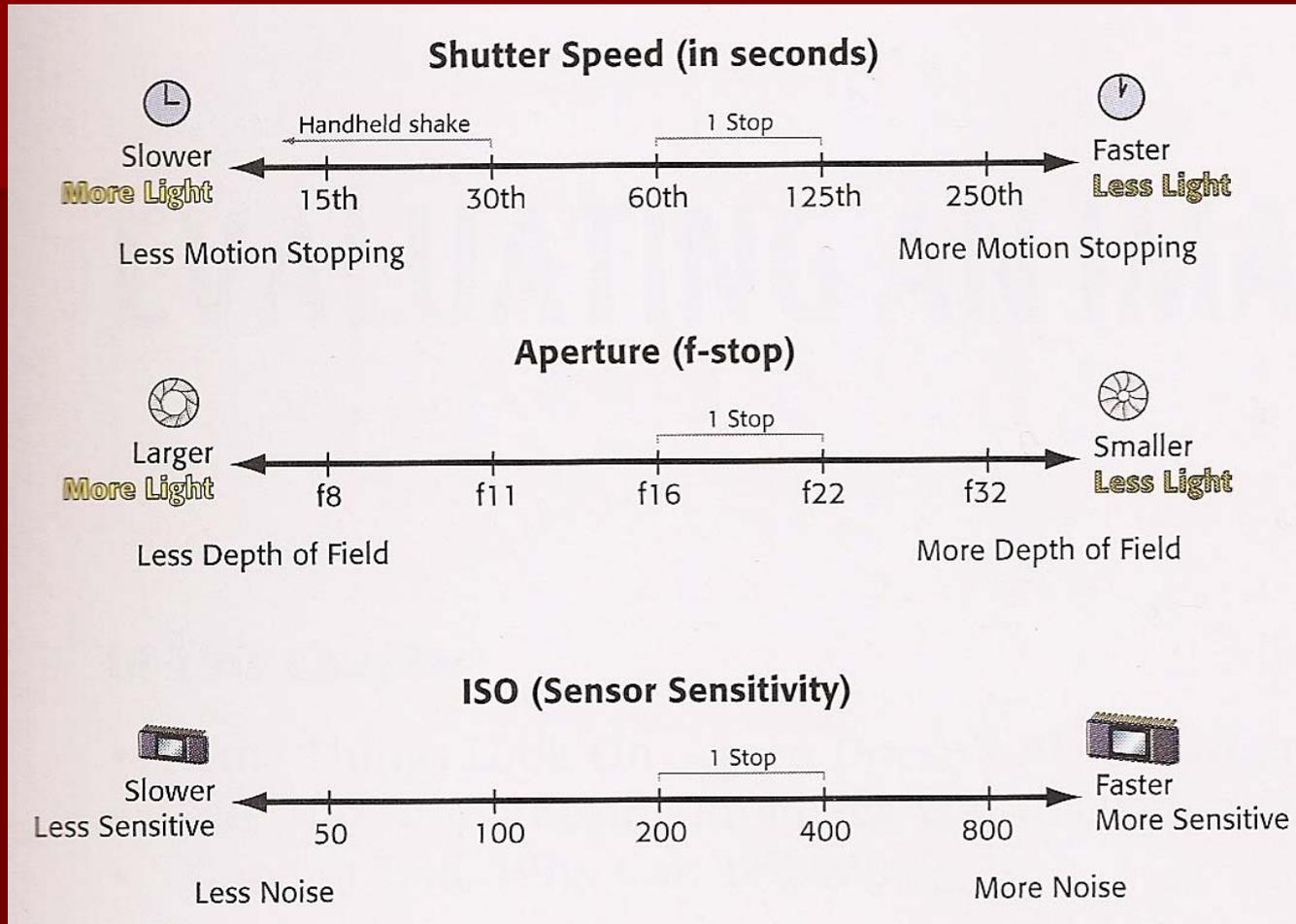


Exposure:

To summarize, exposure is governed by:

- Amount of light being reflected from the subject
- The ISO setting of the film or sensor
- The speed at which the shutter is opening & closing
- The size of the aperture (f-stop) or lens opening

Reciprocity:



Shutter	1/15	1/30	1/60	1/125	1/250	1/500	1/1000
f/stop	f/22	f/16	f/11	f/8	f/5.6	f/4 f	/2.8

Exposure:

Exposure Compensation

- Practice used to manually correct exposure when you observe the metered exposure to be consistently over or under exposed
Ex. Photographing snow or beach scenes
- Most cameras allow up to 2 stops of exposure compensation; each stop of exposure compensation provides either a doubling or halving of light compared to what the metering mode would have done otherwise. A setting of zero means no compensation will be applied (default).

Exposure:

Bracketing

- A practice of ensuring that an image is captured with proper exposure by deliberately taking one photo correctly exposed as per the meter, followed by one photo under-exposed by one stop, and one photo over-exposed by one stop

Auto Bracketing

- Some cameras have an auto bracketing function that, when activated, will automatically bracket each shot.

Shooting Modes:

Auto

- Fully automatic; Camera will function as a point-and-shoot

Program (P)

- Offers a little more control than Auto;
- Camera will automatically select shutter speed and aperture, which you may be able to override
- Usually allows for manual setting of ISO, white balance, focus, and flash
- May not always give you the best result

Shooting Modes:

Aperture Priority (AV)

- You select the aperture setting, the camera will select the appropriate shutter speed for a proper exposure
- Good for prioritizing Depth of Field

Shutter Priority (TV)

- You select the shutter speed, camera will select appropriate aperture;
- Good for movement related images; ie. capturing a sharp image of a fast moving subject or blurring a moving subject

Shooting Modes:

Manual (M)

- Fully manual; allows you to control all settings including ISO, shutter speed, aperture, focus, white balance.

Special Modes (All camera models will vary)

- Portrait Mode -- Favours wide aperture to soften background
 - Landscape Mode -- Locks focus on infinity; uses as small an aperture as possible for maximum depth of field
 - Close-Up or Macro Mode – For detailed close-up shots
 - Sports Mode – Uses a large aperture to allow for faster shutter speeds
 - Night Mode – Uses slow shutter speeds for dimly lit scenes and usually fires flash for foreground illumination.
- ... among others.

White Balance

- An incorrect white balance (WB) can create unsightly blue, orange, or even green color casts, which are unrealistic and particularly damaging to portraits.
- Understanding digital white balance can help you avoid color casts created by your camera's AWB (Auto White Balance), thereby improving your photos under a wider range of lighting conditions.
- WB is the process of removing unrealistic color casts, so that objects which appear white in person are rendered white in your photo. Proper camera white balance has to take into account the "color temperature" of a light source, which refers to the relative warmth or coolness of white light.

White Balance:



Improper white balance



Correct white balance

Light: Hot or Cold?

Colour Temperature

Light Source

1000-2000 Kelvin

Candlelight

2500-3500 K

Tungsten Bulb

3000-4000 K

Sunrise/Sunset (clear sky)

4000-5000 K

Fluorescent Lamps

5000-5500 K

Electronic Flash

5000-6500 K

Daylight with Clear Sky

6500-8000 K

Moderately Overcast Sky

9000-10000 K

Shade or Heavily Overcast Sky

Low Temperature = ORANGE CAST (warm light)

Higher Temperature = BLUE CAST (cool light)

White Balance



Daylight



Fluorescent



Tungsten



Shade

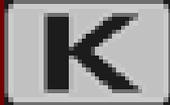
White Balance



Auto



Custom



Kelvin
(Temperature)



Tungsten



Fluorescent



Daylight



Flash



Cloudy



Shade

Questions?