







More About Your Camera

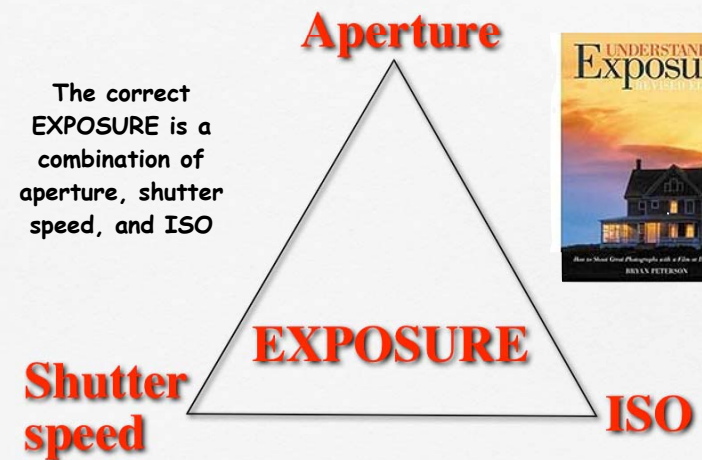
6 Important Things to Know

Important and Useful Stuff ...

- EXPOSURE
 - ISO (film speed or processor sensitivity)
 - f stop (aperture)
 - Shutter speed
- Depth of field (related to f stop)
- White balance
- Shooting modes
 - auto, programmed, shutter or aperture priority, and manual

Those Little Icons

-  Portrait - Set your digital camera to portrait mode when your taking photographs of people. Portrait mode will set the image color for skin tone perfectly.
-  Landscape - Set your camera to this mode when your taking photos of landscapes. For example if your photographing beach or mountain sceneries.
-  Close Up - Close up mode speaks for itself. For example, when you want to photograph small objects so they fill the whole frame as if to appear larger.
-  Sports - Sports mode should be used when you want to photograph a moving object such as a child or dog running.
-  Night Portrait - Choose night portrait automatic mode when you want to shoot a person in low light such as night time.
-  Flash Off - This mode is useful for times when your not allowed to use a flash. For example, in an art gallery.



Creatively Correct Exposure

"Most picture taking situations have at least 6 possible combinations of f-stops and shutter speeds that will result in a correct exposure. Yet, formally just one of these combinations ... is the **creatively correct exposure**."

from Peterson, page 24

Exposure



f/1.8 at
1/160 sec

f/22 at
1 sec

f/8 at
1/10 sec

Auto white balance for all; ISO 400

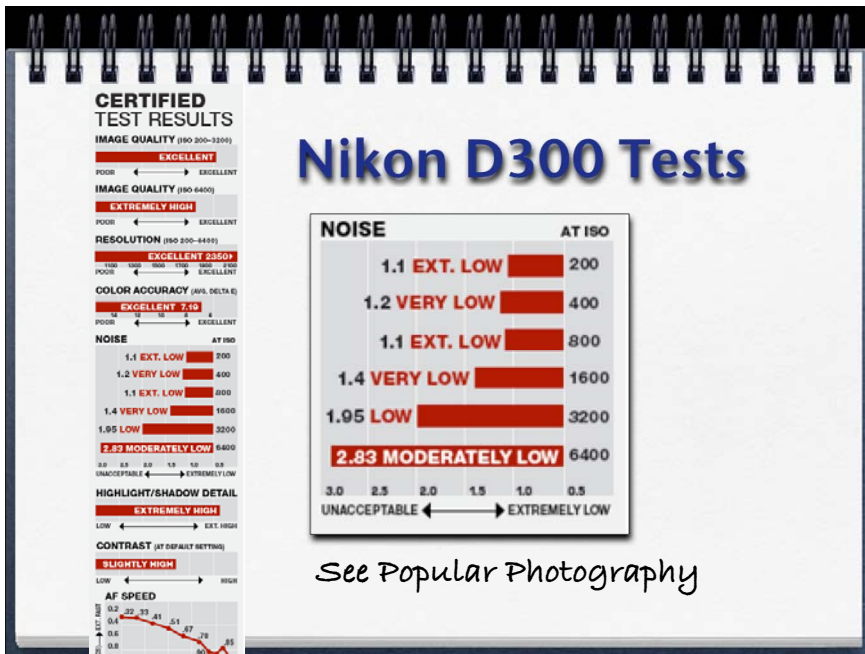
Ben Ham Images



Done at high f stop and long shutter speed

ISO

- From Wikipedia: Film speed is the measure of a photographic film's sensitivity to light. **Film with lower sensitivity (lower ISO/ASA speed) requires a longer exposure** and is thus called a slow film, while stock with **higher sensitivity (higher ISO/ASA speed) can shoot the same scene with a shorter exposure** and is called a fast film.
- Typical ISO values for digital cameras are 200-800.
- Above 800 or so noise can become a problem.



Aperture, f-stop

$$f / \# = N = \frac{\text{lens focal length}}{\text{aperture diameter}}$$

$f/1.4$ $f/2$ $f/2.8$ $f/4$ $f/5.6$ $f/8$

f-Stop Conventions

Modern lenses use a standard f-stop scale that is a geometric sequence corresponding to the sequence of powers of square root of 2:

$$f \text{ stop} = (\sqrt{2})^n$$

1, 1.4, 2, 2.8, 4, 5.6, 8, 11, 22, 32

Sunny 16 Rule

An approximately correct exposure can be obtained on a sunny day by using an aperture of **f/16** and a shutter speed close to the reciprocal of the ISO speed of the film.

For ISO = 400 with f/16, use a speed of _____ sec

Eyes and f-Stops

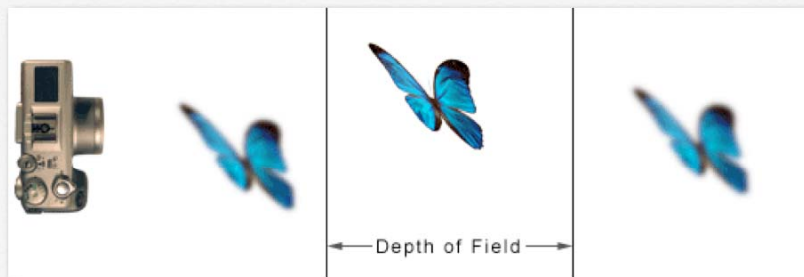


The human eye has an f-stop of about 8.3 in very bright light and about 2.1 in dim light.

Depth of Field: Sharpness & Image Quality

- Depth of field (DOF) is the area of sharpness within a photograph.
Depends on—
 - focal length of lens
 - distance between you and subject
 - APERTURE !

Depth of Field: Sharpness & Image Quality



<http://www.dofmaster.com/dofatble.html>

Depth of Field



50 mm lens
f/22
0.4 sec
DOF = 3.95-6.82 ft



50 mm lens
f/1.8
1/400 sec
DOF = 4.9-5.1 ft

Exposure



f/1.8 at
1/160 sec
DOF =
2.9-3.1 ft

f/22 at
1 sec
DOF =
2.59-3.56 ft

f/8 at
1/10 sec
DOF =
2.84-3.18 ft

Depth of Field Calculators



- iPhone calculator app
- Online at www.dofmaster.com

DOF: Aperture & Lens Dependence

Nikon camera with subject at 10 feet

50 mm lens

f/2.8	f/4	f/5.6	f/8	f/11	f/16
9.4-10.7	9.12-11.1	8.81-11.6	8.39-12.4	7.87-13.7	7.23-16.2

150 mm lens

f/2.8	f/4	f/5.6	f/8	f/11	f/16
9.93-10.1	9.90-10.1	9.86-10.1	9.80-10.2	9.72-10.3	9.60-10.4

DOF on a Point & Shoot



5.8-23.2 mm lens, f/4, 1/400 sec. ISO 80

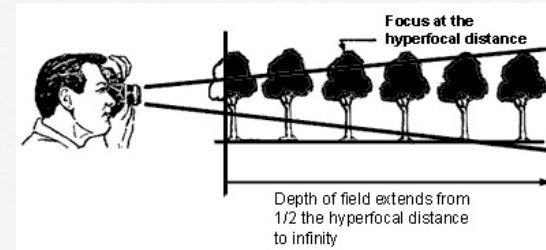
DOF on SLR's and P&S's

f-Stop Digital SLR	Equiv. f-stop Point-Shoot
2.8	11
4	16
5.6	22
8	32
11	64

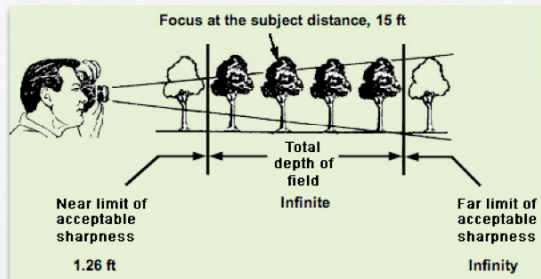
This illustrates the major drawback to P&S cameras — difficult to get narrow depth of field.

Another drawback is that the image quality is lower owing to the tiny aperture.

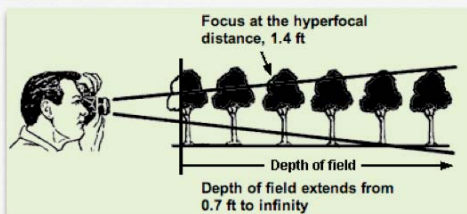
DOF and Hyperfocal Distance



When the lens is focused on the **hyperfocal distance**, the depth of field extends from half the hyperfocal distance to infinity.



DOF and Hyperfocal Distance



Calculations for 5.8 mm lens with f/4 at 15 feet.

Lens "Sweet Spot"

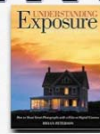
Popular Photography: February 2009, page 63

- "... you can actually lose sharpness at the smallest apertures, such as f/22. It's paradoxical—although the image may look sharper overall due to the depth of field, the detail, when viewed closely, will be softer."
- "From f/8 to f/11 is really the sweet spot."



Storytelling Apertures

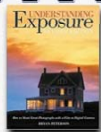
- Objective is to get all of the subject in focus from front to back.
- Shoot with wide-angle lenses (17-35 mm) or even "normal" lenses (45-60 mm).
- Regardless, "A small lens opening (high f-stop) is the rule!"



Storytelling Apertures



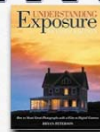
55 mm lens, f/9, 1/250 sec. ISO 500,
everything >15 feet is in focus.



Storytelling Apertures



70 mm lens, f/18, 1/500 sec. ISO 400,
everything >6 feet is in focus.



Storytelling Apertures

This is the reason landscapes are usually done with very small apertures and therefore slow shutter speeds



Singular Theme Apertures

- Now we want to have just the subject in focus and the rest blurred.
- Telephoto lenses with small apertures (f/2.8 - f/5.6)



Singular Theme Apertures



150 mm lens, f/2.8, 1/40 sec. ISO 1000, DOF = 0.03 ft

Singular Theme Apertures



150 mm lens, f/2.8, 1/60 sec. ISO 1000, DOF = 1/2 ft

Shutter Speed

- Point & shoot: from less than 1 sec to 1/2000 sec
- DSLR: from less than 1 sec to 1/8000 sec
- Full "stops": ... 1/30, 1/40, 1/50, 1/60, 1/80, 1/100, 1/125, 1/160, 1/200, 1/250, 1/320, 1/400, 1/500, 1/640, 1/800, 1/1000,

Exposure



f/1.8 at
1/160 sec
DOF =
2.9-3.1 ft

f/22 at
1 sec
DOF =
2.59-3.56 ft

f/8 at
1/10 sec
DOF =
2.84-3.18 ft

Shutter Speed



150 mm lens
f/6.3
1/1250 sec



150 mm lens
f/22
1/100 sec

Notice change in depth of field

Shutter Speed — Tips

- To freeze motion, shutter speed depends on distance to subject, direction of motion, and lens.
 - Closer to subject - use 1/500
 - Further away - use 1/125
 - Birds: use at least 1/500 sec
- To hand-hold, use no less than 1/focal length of lens.

White Balance

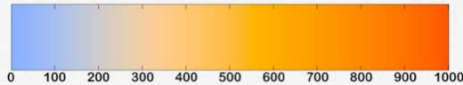
- **Color balance** is the global adjustment of intensities of the colors (RGB).
- A goal is to render specific colors — particularly neutral colors — correctly.
 - The general method is called **white balance** or gray balance
- If you use RAW in a DSLR, you can adjust the white balance in software.

White Balance



Set on "tungsten" instead of "daylight"

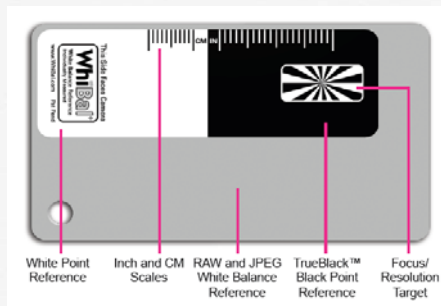
After correcting to daylight in Photoshop.



White Balance on SLR's and Many P&S's

- Auto
- Incandescent
- Fluorescent
- Flash
- Cloudy
- Shade
- Choose color temp.
- Preset manual

WhiBal Card



<http://www.rawworkflow.com/whibal/>



f/22 & 0.4 sec

Using WhiBal Card

50 mm lens
5-10 feet from stake



f/1.8 & 1/320 sec

Shooting Modes

- Auto — Camera sets f-stop, shutter speed, white balance, ISO, and metering mode. (Not on a DSLR)
- Programmed — Can set ISO, white balance, and metering mode. Camera does the rest.
- Shutter priority — You set shutter speed, ISO, white balance. Camera sets f-stop. (Use for action shots.)
- Aperture priority — You set the aperture, ISO, white balance. Camera sets shutter speed. (Use for creative shots.)
- Manual — You do it all!