

Photography and Photoshop

A person is seen from behind, standing on a rocky desert ridge. They are wearing a dark jacket and blue jeans, and are leaning over a camera mounted on a tripod. The camera is pointed towards a sunset over a valley. The sky is a mix of orange, yellow, and blue, with some clouds. In the foreground, there are several cholla cacti and some low-lying desert shrubs. The overall scene is a classic desert landscape at dusk.

Presented by Craig Stocks Arts
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Photography Topics

- Basic camera settings for point and shoot cameras (resolution, quality)
- Resolution - how much can you enlarge a picture?
- Composition basics
- Pictures of people - both inside and outside
- How to use fill flash
- Shooting for a panorama
- Close-up settings
- Movie settings

- Advanced Camera Settings
- Exposure basics - ISO, shutter speed, f-stop
- Camera modes: Auto, Program, Av, Tv, M, B
- Setting and using blinkies
- Reading the histogram

- Advanced camera settings (for digital SLR cameras)
- Raw verses JPEG
- Dust on sensors
- Lens choices
- Lighting basics
- Bounce flash and simple flash modifiers
- Off-camera flash
- Advanced flash modifiers (umbrellas, reflectors)

Shutter Lag

- All cameras will have a delay between pushing the shutter button and taking the picture
 - Generally less of an issue with more expensive cameras
- To minimize the problem:
 - Pre-focus by pushing the shutter button half way
 - Switch to manual focus
 - Choose a manual exposure mode

Camera Shake

- Camera shake may affect more photos than any other flaw
- Hold the camera steady
- Gently squeeze the shutter release
- Hold your breath when taking the picture
- When possible, use high ISOs and fast shutter speeds
 - Many cameras will warn you if camera shake is likely
- Use a tripod when possible
- Practice

Digital Photography Basics

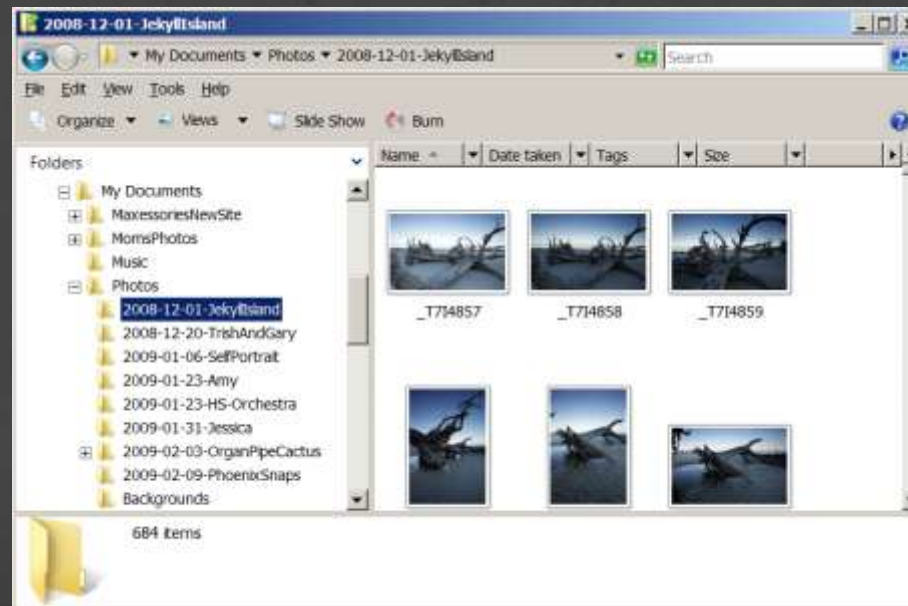
- Choosing a memory card
- Copying files to your computer
- Clearing your memory card
- Backing up your photos

Memory cards

- Bigger isn't always better
 - Higher capacity more prone to failure
 - Lower priced are more prone to failure
 - With use, cards are more prone to failure
 - With time, cards are more prone to failure
- Ideal – large enough to comfortably hold high resolution images until you are ready to download
- Don't delete individual photos
- If you're comfortable changing cards in the field, you may be better off with two lower capacity cards rather than one high capacity card

Copying Files

- Best to use a card reader rather than connecting the camera to the computer
- Determine a folder structure that makes sense to you
 - For instance, 2009-02-03-OrganPipeCactus



Clearing Your Memory Card

- Always clear your memory card by formatting it in the camera where it will be used!
- Do not:
 - Erase individual photos in the camera
 - Erase all files in the camera
 - Delete files on the card when it's connected to a PC
 - Format the card when it's connected to a PC



Back-up Your photos

- Computers, disk drives, memory cards, CDs, DVDs will all eventually fail or become unreadable
- Options
 - Portable USB hard drive (\$100)
 - CD or DVD
 - On-line storage
- If your photos are really important to you:
 - Back up onto more than one medium
 - Store one of the backups off-site
 - Periodically re-copy backups (especially CD/DVD)

Setting Your Digital Camera

- Resolution – file settings
- White balance (color balance)
- Exposure settings
 - ISO
 - Shutter speed
 - Aperture (or f-stop)

Resolution

- More pixels will result in a sharper image, but also results in larger files
- Total pixels = width x height
 - e.g. 3,000 wide by 2,000 high = 6,000,000, or 6 MP
- Standard TV screen 640 x 480 (0.3 MP)
- Computer display 1,024 x 768 (0.8 MP)
- Computer display 1,600 x 1,200 (1.9 MP)
- HDTV screen
 - 720p = 1,280 X 720 (0.9 MP)
 - 1080p = 1,920 X 1,080 (2.1 MP)
- 4 x 6 inch print = 1,200 x 1,800 (2.2 MP)
- 8 x 10 inch print = 2,400 x 3,000 (7.2 MP)
- 16 x 20 inch print = 4,800 x 6000 (28.8 MP)
- “Ideal” print resolution is 300 pixels per inch
- Acceptable range is 240 to 480 pixels per inch

Resolution

- Set your camera to max resolution if:
 - You want the best quality
 - You want to make prints
 - You expect to crop your photos
 - You have enough storage space

- Set your camera to low resolution if:
 - You don't expect to make prints
 - Primary use is web or e-mail
 - Storage space isn't available

Resolution – File Settings

- The JPEG file format uses a variable compression algorithm that gives up quality for space
- The file setting determines the trade-off



Large – 239 KB file



Small – 53 KB file



Flash settings

- Choices are Auto, On or Off
- On
 - Snapshots in a dark room (up to about 15 feet)
 - People in bright sunlight
 - To balance a dark foreground with a bright background
- Off
 - Large venues (concert, ball game, etc.)
 - Subjects range from near to far in a single picture
 - In rain or snow
 - When there are mirrors or windows in the background
 - Close-up photos

Composition Basics

- Fill the frame
- Rule of thirds
- Framing elements
- Foreground – middle ground – background
- Leading lines
- Repetitions
- Color depth

- Recommended website: The Mindful Eye
 - www.tmelive.com
 - The Daily Critique by Craig Tanner
 - Photo of the Week

Fill the Frame

The photo to the right fills the frame with the subject. It also avoids putting the main subject (the hawk's head) in the center of the frame.



Rule of Thirds



Rule of Thirds



Framing Elements



Foreground to Background

Don't be afraid to use vertical compositions for landscapes. It's a great way to include more of the foreground to give the image more depth.



Unusual Perspectives

Put the camera somewhere different – on the ground, up in the air, etc.



Leading Lines



Repeating Elements



Color Depth



Skys and Clouds



Clouds add a great deal of interest.

Photograph early or late in the day at
right angles to the sun

Skys and Clouds

You can use Photoshop to add clouds from another photo



Sunsets



Sunsets



Lighting Basics

- Light added to a scene serves two purposes:
 - Brighten the scene so it can be recorded
 - Create shadows, which add texture and depth
- A flash on the camera can't create shadows
 - It can only brighten the scene
- Normally want the light source to be somewhere other than the camera
- The size of the light source will determine the character of the shadows (sharp or soft edges)

Beautiful Light – Find or Make

- Find beautiful light:
 - Indoors near windows
 - Overcast days
 - Early or late in the day
 - In the shade
 - Backlit scene

Beautiful Light – Find or Make

- Make it
 - Reflect light into the scene
 - Piece of white cardboard
 - Windshield sun block
 - Styrofoam insulation (with or without foil backing)
 - Stand near a white wall
 - Block light from the scene
 - Any of the reflectors listed above
 - Another person

Wait for the Light

Two photos taken 4 minutes apart
just before sunset.

Avoid the harsh light transition on
the cactus

Light is less yellow overall

Color depth between blue-ish
foreground and red-ish
background



Advanced Lighting Techniques

- LumiQuest Soft Screen Diffuser
- On-camera flash bounced off a ceiling or wall
- Variety of off-camera tools and techniques



Pictures of People

- Don't position your subjects until you're ready
- Don't let your subjects stand against a wall
 - Remember foreground and background
- If possible, avoid bright sunlight
- Keep the sun behind your subject
- Use fill flash in bright sunlight



Fill Flash

If you turn on the flash in bright sunlight, most cameras will automatically create fill flash where the flash provides just enough light to fill in the shadows.



Putting It Together



Advanced Settings

- Using all of your camera's features
 - Special modes
 - White balance
 - Exposure control
 - Camera modes beyond automatic
 - Histograms

Panoramas



- Turn camera to vertical orientation
- Choose a mid-range focal length (not extreme wide)
- Set to manual exposure
- Overlap about 1/3



Close-up Photos

- Most point and shoot cameras have a close-up mode
- Usually indicated by a flower icon

Turn off the flash
Zoom to telephoto
Hold the camera very steady



White Balance

- Different light sources emit different colors of “white” light.
- The color of the light is defined by color temperature in degrees Kelvin
 - Tungsten lights – 2850 K (reddish)
 - Fluorescent lights – 3800 K (yellow – green)
 - Daylight (mid-day) – 5000 K
 - Electronic flash – 5500 K
 - Cloudy days – 6500 K (cyan)
 - Shade – 7500 K (blue)
- Our eyes and brains compensate so that all light tends to look white
- Cameras (film, digital, video) need to compensate for different light sources

White Balance – Choosing the Best Setting

- Auto – the camera attempts to neutralize the color by averaging the scene. It's rarely right, but usually close.
- Daylight – my choice for 90% of photos
- Cloudy – rarely use
- Shade – rarely use
- Tungsten – use 10% of time for indoor photos
- Fluorescent – rarely use, fluorescent bulbs vary widely
- Custom – rarely use

Exposure Settings

- ISO – sensitivity level
 - Higher number is more sensitive to light
 - Lower number yields a cleaner image (less noise)
 - Doubling the value doubles the sensitivity
- Shutter speed – how long the sensor is exposed
 - Expressed in fractions of a second (e.g. 1/60)
 - Doubling the value is $\frac{1}{2}$ the light (1/60 to 1/125)
 - Slow shutter speeds are prone to motion blur
- Aperture (f-stop) – size of the opening in the lens
 - Larger number is a smaller opening
 - Standard values are f 2.0, 2.8, 4.0, 5.6, 8, 11, 16, 22, 32, 45, ...
 - Each step up to a larger value halves the amount of light
 - Large lens openings result in shallow depth of field (less of the scene is in focus)
 - Not really much of a factor on P&S cameras
- “One stop” of change doubles (or halves) the amount of exposure. It can be accomplished by changing any of the above by one increment.

Basic Camera Setup

- The ideal combination is:
 - Lowest ISO setting on the camera
 - High shutter speed (1/250 or faster)
 - Small aperture (f-8 to f-16)
- Camera setup options:
 - ISO setting
 - Auto – if you don't want to think about it at all, this is OK
 - Otherwise, choose the lowest ISO that gives you a reasonable shutter speed (1/60th or faster)
 - Shutter speed and aperture
 - Auto works pretty well on today's cameras

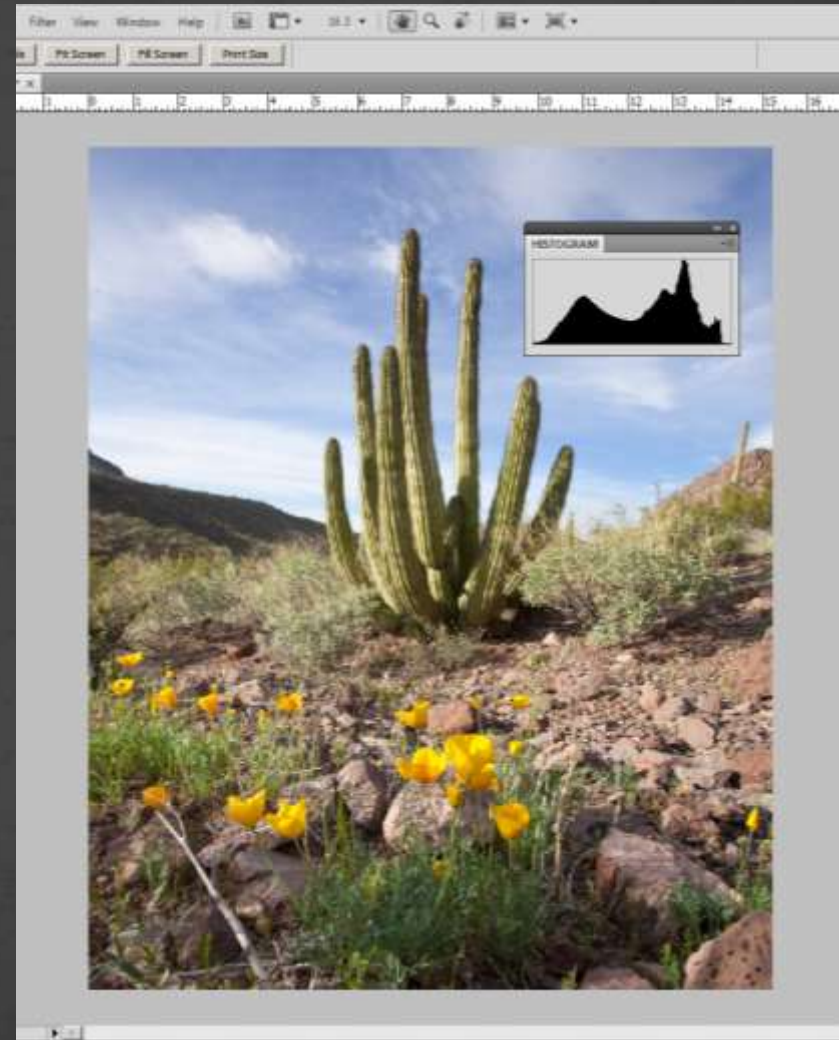
Camera Modes

- Auto – Camera does everything, including white balance, ISO, and some resolution and file settings
- Program – You can specify WB, ISO, resolution and file settings
- Av (Aperture value) - You specify the f-stop and the camera determines the correct shutter speed
- Tv (Time value) - You specify the shutter speed and the camera determines the correct f-stop
- M (Manual) – You specify both shutter speed and f-stop
- B (Bulb) – You specify the f-stop and the shutter will stay open for as long as you hold the shutter release

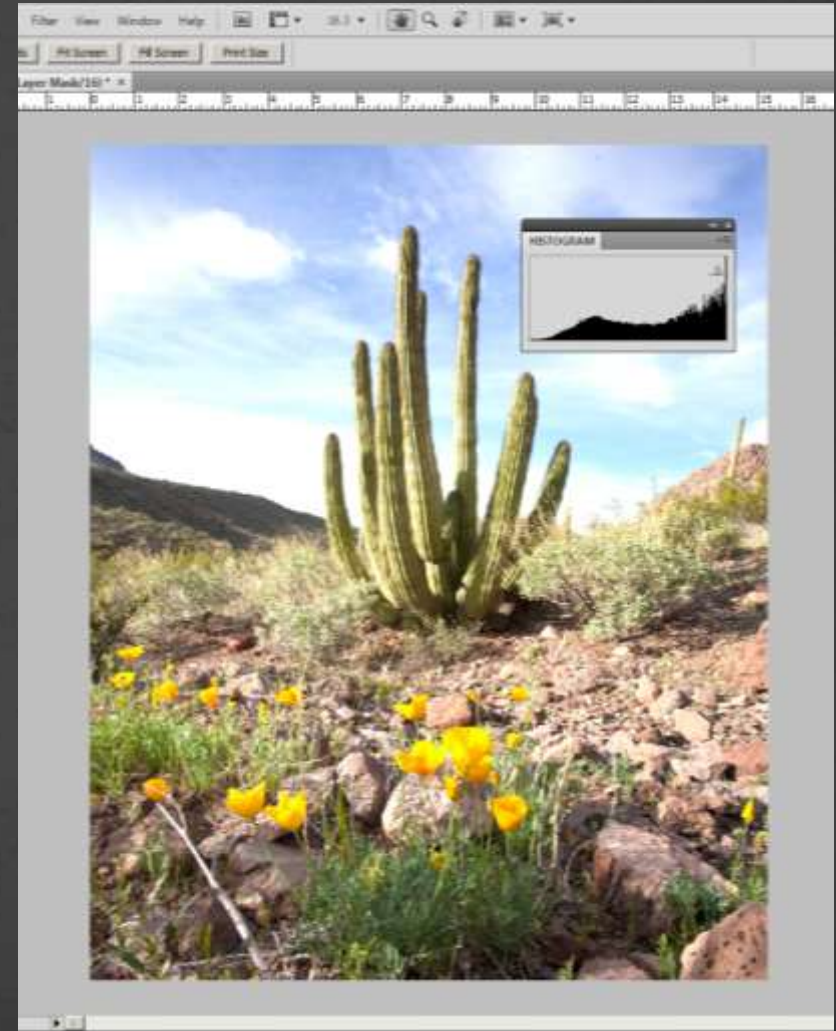
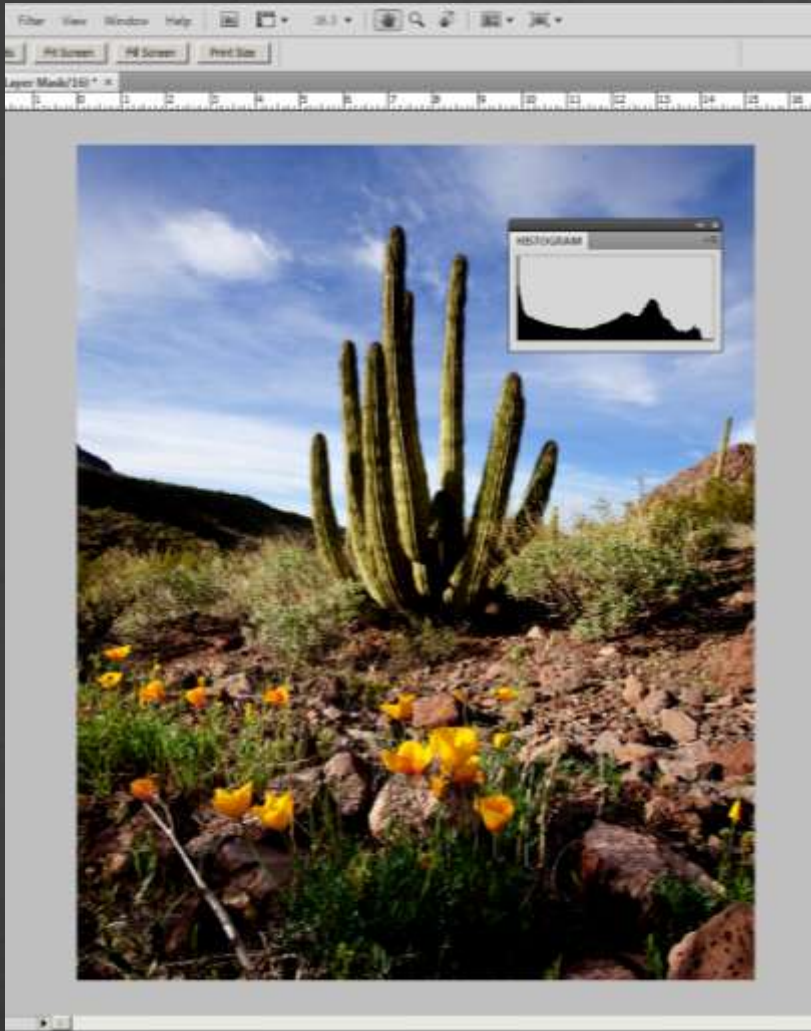
Histogram and “Blinkies”

- Histogram shows the distribution of tones within an image
- Dark is on the left, light tones on the right
- The height shows the frequency of occurrence of each tone
- There’s no “perfect” histogram, it depends on the scene

- Guidelines:
- Try to use all the tones from dark to light
- Avoid pile-ups at either end (clipping)



Under and Over Exposure



Exposure Compensation

Use the exposure compensation feature (+/-) to adjust the exposure
Watch the histogram to ensure you're getting the result you want



Blinkies?

- Some cameras allow you to turn on highlight clipping warnings.
- This feature causes overexposed highlights to blink when you view the photo
- If you see non-specular highlights blinking, then use exposure compensation to reduce the exposure.

Advanced Topics



Camera Settings for Digital SLRs

- Digital Single Lens Reflex cameras offer additional features
 - Larger sensors
 - Interchangeable lenses
 - Higher quality file format
- Price gap continues to close

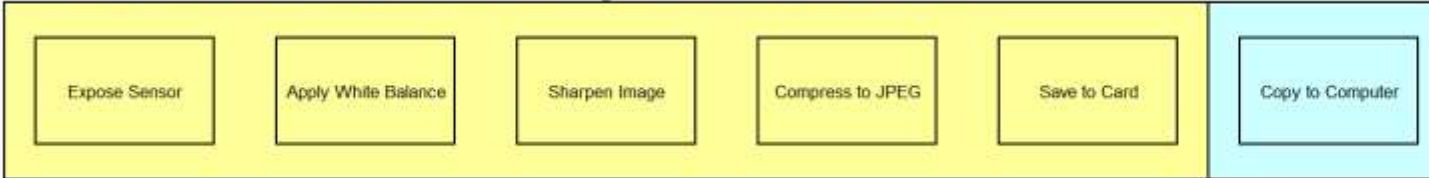


Sensor Size

- DSLRs offer significantly larger sensors than P&S
 - Rebel Xsi 22.2 x 14.8 mm 12.2 mp 3.7 px/cm²
 - G10 7.6 x 5.7 mm 14.7 mp 33.8 px/cm²
- Larger pixels create better image quality
- Lens aberrations aren't magnified as much
- DSLRs typically offer greater bit depth
 - Higher bit depth yields smoother tones

Raw versus JPEG

JPEG Workflow - camera bakes the image into a finished JPEG



Raw Workflow - camera saves raw file, you bake the final image however you want



- Retain native bit depth
- Ability to apply any white balance after the fact
- Freedom to choose how to process the image
- Can re-process images in the future with new software

Raw File Processing Software

- Basic software from camera manufacturer
 - Canon – Digital Photo Professional (included free)
 - Nikon – View NX (included) & Capture NX (\$150)
- Adobe Photoshop / Photoshop Elements
 - Adobe Camera Raw
- Adobe Photoshop Lightroom
 - Same converter as ACR
- Capture One
- Etc.

Dust on Sensors

Since the sensor isn't sealed inside the camera, it will collect visible dust spots.



Removing Sensor Dust

Easiest approach is to use a bulb-type blower to remove loose dust

Many new cameras include ultra-sonic dust removal processes

There are also numerous more aggressive cleaning techniques that use both wet and dry approaches, such as the Arctic Butterfly brush by Visible Dust

DO NOT use canned air blowers



Lens Choices

- Most DSLRs have a multiplication factor (around 1.5)
 - Multiplication factor allows conversion to 35mm standard
 - For instance, a 200mm lens on a DSLR will magnify like a 300mm lens on a 35mm film camera
- Frequently quote 35mm equivalent focal length
 - 16mm to 35mm – wide angle (< 24mm is extreme wide angle)
 - 50mm – normal lens
 - 85mm to 300 mm – telephoto (> 300mm is extreme telephoto)
- Zoom lens can adjust within a range of focal lengths
 - Modern zoom lenses rival most prime lenses
- A prime lens is fixed focal length
 - Historically have provided the best image quality
- A “fast” lens is one with a large maximum aperture
 - Typically f-1.4 to f-2.8