CELEBRATING 20 YEARS

CONTEMPORARY QUILT ART ASSOCIATION

Contemporary Quilt Art Association *Presents*

DIGITAL PHOTOGRAPHY FOR ARTISTS

An Introduction to Digital Cameras, Lights & Photographing Artwork

HOW TO TAKE DIGITAL PHOTOS OF YOUR ARTWORK

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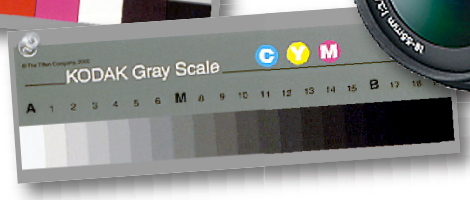
Lighting for Digital Photography



Color Charts

Point & Shoot vs. SLR

Hidden Camera Features

D-PICS DIGITAL IMAGING

By Craig Ingle

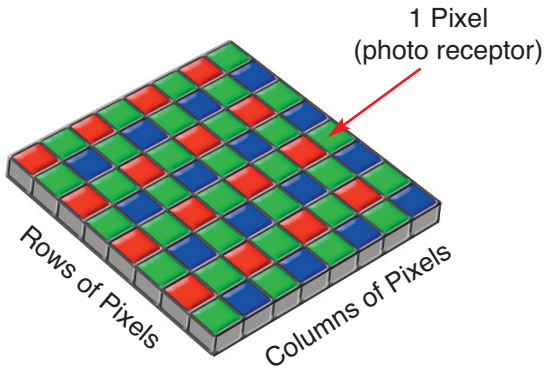
All Digital Cameras Work Alike

Today's digital cameras come in lots of sizes and prices. There are $200 Point-and-Shoots to DSLRs (Digital Single Lens Reflexes) that cost thousands of dollars. But, regardless of cost, they all work in basically the same way. Once you understand what's going on inside your digital camera, you can start getting better photos than ever before. Then do bit of clean up work with Photoshop Elements and you may have a masterpiece.

What is a Pixel?

At the heart of every digital camera there is a chip called the digital sensor. It is located directly behind the lens, where the film use to set in a film camera. This chip is made up of tiny photo receptors commonly called pixels. The pixels are arranged in rows and columns to form a grid pattern. Each receptor measures the amount of light hitting it and converts it to a digital value. When added together in the camera, they form an image of what the lens sees.

Digital Camera Sensor



The example above has
8 rows x 8 colums = 64 pixels

By comparison, a typical 6 Megapixel camera will have 2008 rows x 3032 columns of pixels in its sensor.

How Many MegaPixels Do You Need?

If you visit a camera store, you may come away thinking the number of megapixels (MP) is the only thing that counts. The fact is, any digital camera with at least 4MP to 6MP is going to make great 5 x 7" color prints at 300 dpi. Even an 8 x 10" photos only require 8MP. If you print at 200 dpi (instead of 300 dpi), you can print even larger photos that will still be clear and sharp.

Here is a chart showing megapixels vs. print size:

Camera (MegaPixels)	**Pixel Count** (Typical)	**Photo Size** (Printed 200 dpi)	**Photo Size** (Printed 300 dpi)
3MP	1536 x 2024	7.6 x 10"	5 x 7"
4MP	1704 x 2272	8.5 x 11"	6.4 x 8.5"
5MP	1920 x 2560	9.6 x 12.8"	6.4 x 8.5"
6MP	2008 x 3032	10 x 15"	6.7 x 10"
8MP	2448 x 3264	12 x 16"	8 x 10.8"
10MP	2736 x 3648	13.6 x 18"	9 x 12"

FYI: Digital cameras are color blind. Each pixel can see only shades of grey. A red, green or blue color filter is attached to each pixel so it can “see” a single color. A computer in the camera interplates the missing colors and creates the finished full color image.

So, is there any advantage to more pixels? Yes, there are a couple of good reasons for buying extra megapixels.

- If you need to crop a photo and enlarge a small portion (such as a single person out of a group photo).
- If you are going to print posters or photos larger than 9 x 12”.
- If you submitting a photo for publication that will be printed full page or double page at 300 dpi. Note, most photos in magazines and other publications are printed smaller that full page.

Example of Crop & Enlarge

Use What You've Got to Max

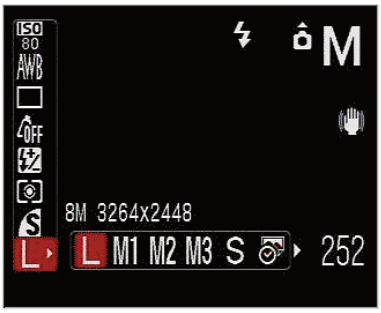
Before you rush out and buy a new digital camera remember, even low cost Point & Shoots are capable of taking better photos if they are set correctly. Here are some ways to max out your camera, that won't cost a cent.

1. Set Files Size to Max
Most digital cameras let you to create photos that are smaller than the full sensor size. For example, an 8MP camera, can also take 6MP, 4MP, or even 2MP photos. Don't toss away pixels, set size to max.

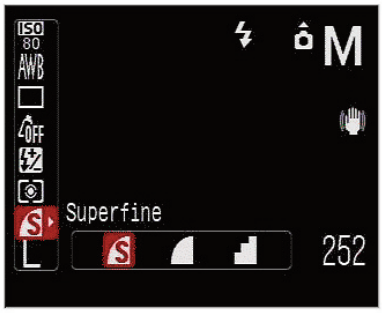
2. Set Type (Format) to Best Quality JPG
Digital cameras can save photos internally in several formats. For most casual photographers, I recommend using **Best Quality JPG**. It is easier to handle and view, and when opened in **Photoshop Elements** and resaved as a TIF, it retains all its quality.

3. Use Low Compression
Compressing JPGs is a bad idea. Even if you have lots of megapixels, your photos will suffer unrepairable damage if you use too much compression. Make sure your camera is set to **Low Compression / Best Quality**.

File Size



File Quality
(Some cameras combine file type and compression in quality setting)



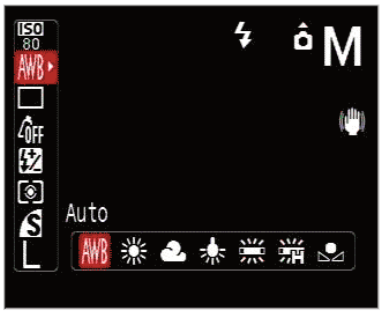
Discover Hidden Control Features

Buried deep in the menus of your digital camera are a number of features that can give you more control when photographing artwork. Your camera may have all or some of these:

Look for Menu or Function button on camera back.

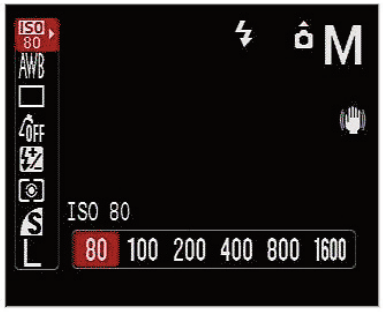
1. White Balance
This helps correct for the color of the light that is illuminating your artwork. Choice include: Auto, Daylight, Cloudy, Tungsten, Fluorescent and Custom. For photographing artwork, its best to set it for **Daylight** and use Color Chart to correct (see page 8).

White Balance



2. ISO
This is similar to film speed in film cameras. Higher numbers let you shoot with less light. Typical choices are 50, 100, 200, 400, 800+. Unfortunately, higher numbers create noise and bad grain. For best results, use the lowest number on your camera and use a tripod.

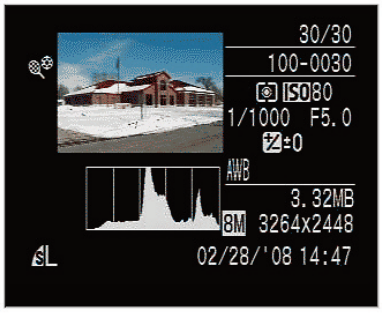
ISO



3. Shutter Speed and aperture Control (F-Stop)
Shutter speed and aperture work together to control how much light enters the camera. If your camera offers aperture Priority, use a mid range f-stop (like f11) for best quality. Shutter speed will be longer, so use a tripod.

4. Histogram & LCD Viewer
Don't believe everything you see on the LCD viewer on the back of the camera. The colors, brightness and contrast won't be all that accurate. Instead, turn on the camera's histogram for a reality check. You want the "hill" in the middle and not touching either the left or right side of the graph.

Histogram



5. Flash, Red-Eye, Face-Detect, etc.
These "features" are fine for snap-shots, but they are bad for photographing artwork. You don't want the camera deciding what your art should look like, so turn them all off.

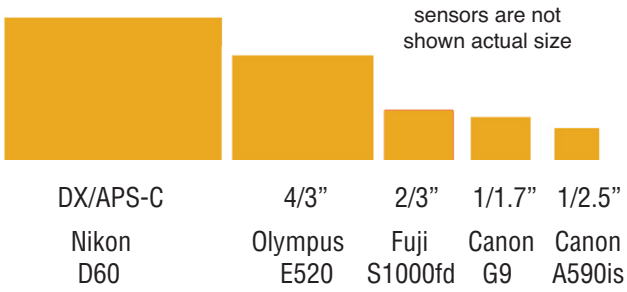
Is an SLR Better Than a Point & Shoot?

If money is no object, then yes SLRs are better than Point & Shoots -- but maybe not for the reasons you think. A good quality Point & Shoot, used correctly, can give better results, than a SLR used incorrectly. Remember, high priced paint brushes don't make you a great painter.

SLR vs. Point & Shoot

What the Sales Guy Won't Tell You

The myth is "more pixels are better." The fact is a high quality 6MP may produce better photos than a cheap 10MP. Here's why. The size of the **Camera Sensor** in all Point & Shoots is about 1/4" (smaller than 3/4" in SLRs). To get more megapixels, manufactures reduce the size of each pixel. Smaller pixels can increase noise, grain and distortion. To keep this in perspective, you probably won't see any of this on a 4 x 6" print. Don't buy more megapixels than you need.



Manual Controls vs. Menus

One of the big differences between SLRs and Point & Shoots is how easy is it to manually control the camera. Nothing beats old fashioned mechanical knobs and switches used on SLRs. Unfortunately, they add to the cost. Most Point & Shoots use a series of Menus for control. Small cameras with small buttons and lots of menus can be difficult to use. Test drive any camera before buying.

Mechanical controls add to cost and size of a camera, but can be easier to use than diving down through a lot of menus.

Size, Weight, Features and Price

SLR cameras have their own problems. They are bigger and heavier than Point & Shoots. You can not put one in your pocket or purse, so they are less convenient to carry around. SLRs have removeable lens (which is good), but removing the lens lets in dust (which is bad). SLRs typically have more features, like faster startup, no delay between photos, bright viewfinder, better construction, external flash sync and more. They also cost more. Choose a camera that fits your needs and lifestyle.

Online Camera Reviews

It can be difficult figuring out which digital cameras are best. Local camera stores may not have access to all brands and sales people may not be unbias. Here are some useful online review sites:

http://www.steves-digicams.com
http://www.dpreview.com
http://www.digitalcamerareview.com/reviews
http://www.photographyreview.com/
http://www.photoreview.com.au

FYI: Check the Online Reviews

Here are some issues to look for:

1. How fast does the camera startup?
2. How long is delay when you press button.
3. What is the optical zoom? 3x, 6x, 12x?
4. How are colors, highlights and shadows?
5. Is the lens sharp at edge of photo?
6. Does lens get blurry at telephoto?
7. Do photos show purple fringe or aliasing?
8. How many shots is the battery good for?
9. Is battery rechargeable?
10. Does camera have optical stabilization?
11. How big is sensor? How small are pixels?
12. At what ISO does noise get bad?
13. What manual controls does it offer?
14. How big is it? Does that matter to you?
15. How useful is the built-in flash?
16. How does cost compare with like cameras?

Recommended Camera List

Digital cameras fall into 3 broad categories:

1. **Point & Shoot**
2. **Advanced Point & Shoots (with fixed lenses)**
3. **SLRs (with removable lens).**

Point & Shoot cameras are designed to be light weight, small and low priced. Costs are kept down by replacing external knobs and switches with menus and using lots of plastic instead of metal. They pack a lot of features that can be useful for snapshots. For making smaller prints they are a bargain.

Advanced Point & Shoot cameras are designed for people who want to step up from a basic camera without going to an SLR. Many are built to look like SLRs but without removeable lens. Features, quality and build can rival low end SLRs. The main thing holding them back is the small size of the sensor. They are a good choice for serious photographers on a budget.

Digital SLRs look and feel a lot like film SLRs. Which may explain why professional photographers like them. The main thing that gives them the quality edge is the larger size of their sensors. Bigger sensors mean lower noise and grain, more shades of gray and better color. Another big difference is they have removable lens. This means there are more mechanical things inside, such as a flip-up mirror and optical prism. They are also bigger, heavier and cost more.

It seems that every month manufacturers update and add to their product line. So the examples that are shown on the page will be replaced with “newer and better” cameras at some point. With that said, each of the cameras shown here offers good value in its class.

While these may be my personal favorites, there are a lot of other good choices out there. So I recommend that you read about them online (see page 4), then go to your local camera store and give them a test drive.

Canon A590is	**8MP**	**Basic Point & Shoot**	**$149**
Fuji S1000fd	**10MP**	**Advanced Point & Shoot**	**$249**
Sony H50	**9MP**	**Advanced Point & Shoot**	**$399**
Canon G10	**12MP**	**Advanced Point & Shoot**	**$499**
Olympus E510	**10MP**	**SLR with Lens**	**$599**
Nikon D-60	**10MP**	**SLR with Lens**	**$699**

Canon A590is

Fuji S1000fd

Sony H50

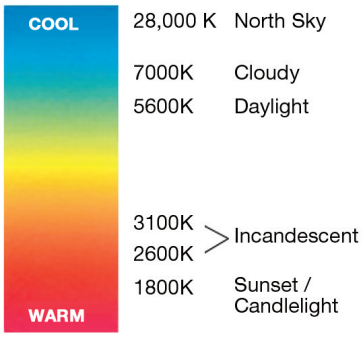
Canon G10

Olympus E510

Nikon D-60

Color of Light

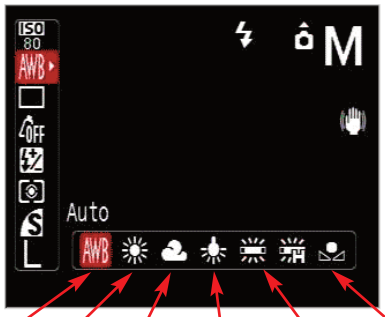
All light has color, which is measured in Kelvin (K). Low Kelvin light appears yellowish-red and high Kelvin light appears blue. With film cameras, you had to choose one of two film types; Daylight for use outdoors and tungsten for use Indoors. Today's digital cameras let you dial in the exact color of light. Cameras have an Auto White Balance that works fine for snapshots. However, when photographing artwork, it is important to adjust the camera's **White Balance** to match the light source.



KELVIN SCALE

Sources of Light

Sunlight and outdoor shade are okay, but hard to control and not very reliable. **Incandescent** lights, like tungsten and halogen are low cost, but can get hot enough to burn or cause fires. Also, the light is yellowish-red. **Electronic Strobe** light has excellent color, but is expensive. Regular **Fluorescent** light has bad color, that is difficult to work with. A new type of fluorescent called **Daylight CFL** is color corrected, runs cool, and is cheaper that strobes. It is probably the best choice.



Auto, Daylight, Cloudy, Incandescent, Fluorescent, Custom
(Typical camera choices for White Balance)

Even Light Across Surface

Wait a minute. If electronic strobe light is good, why not just use the flash that is built into the camera? The main problem is a built-in flash can't light a large flat surface evenly. It will have a hot spot in the middle and be darker around the edges. Your artwork photo will suffer.

Practical Lighting Solutions

The most practical solution is to use a Daylight CFL light setup. You can buy a commercial package, or if you are on a tight budget, you can build your own. Another option is to rent lighting from a camera rental company. This is also a good way to test lighting you are thinking of buying.

Rentals

In Seattle, you can rent cameras, lights and more by the day or week at Glazer's Camera. It's also a good place to check what's new.

Glazer's Camera
430 8th Avenue N.
Seattle, WA 98109
(206) 624-1100
www.glazerscamera.com

Commercial CFL

You can buy a complete Daylight CFL light package by Interfit for $399 that includes two lights (with 5 bulbs each), two light stands and two "softboxs" plus reflectors -- everything needed to do artwork photography. CFL lights are also available with 3 bulbs.

One advantage of these lights, is they provides 500W of continuous light, but only draw 100W of electricity. This is important because it won't over-load your home's electrical wiring.


Daylight CFL lights are available with either 3 or 5 bulbs each

Build Your Own Daylight CFL

If your budget is tight, you can build your own Two Light Daylight CFL System for about $80.00 and two hours labor. Everything you need, except the special daylight CFL bulb, is available at Home Depot. The bulb is available at Glazer's Camera. Here's the shopping list:

4	Metal shelf brackets @ $1.50 each	$ 6.00
1	Six foot 2 x 4" wooden stud	$ 2.00
1	10 1/2" clamp light	$10.00
14	1" wood screws @ 12 cents each	$ 1.68
1	28W CFL blub	$20.00

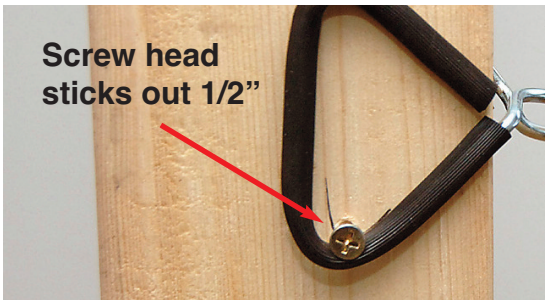
	One Unit	$39.68
	Second Unit	x 2

	Total	$79.36

Step 1: Build Your Light Stand

Attach the metal shelf brackets to one end of the six foot wooden stud. One bracket goes on each side. These will act as the legs of the light stand. Make sure the brackets are flush with the end of the stud, so the stand won't tip or wabble when set up right.

Measure 4 1/2 foot up from the bottom of the wooden stud. Put a wood screw into each side of the stud at same position of the 4" side. Leave the screw head sticking out about 1/2". This will give the light clamp something to grab onto so it doesn't fall off.



Step 2. Assemble The Light

Assemble the parts of the clamp light. Note, the reason for buying the larger 10 1/2" light is that it will give a more even light.

The CFL light bulb is not sensitive to fingerprints (unlike halogen bulbs that can explode if mishandled), but it is fragile. So gently mount it in the clamp light.

When you attach the clamp light to the stand, be sure to hook it securely under the protruding screw heads as shown. This will keep if keep it from falling off during use. If it still seems loose, add two more screws at the top of the clamp area.

Step 3. Tips On Use

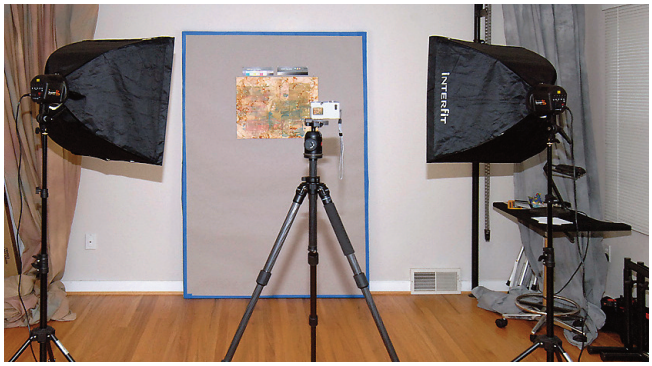
With only one bulb on each stand, the light output will be low. So you will have to use a longer exposure time on the camera. This means you must mount the camera on a tripod. Also, the ambient light level in the room must be very low. I would recommend that you shoot in the evening after dark with no other lights in the room.

Step 4. Storage When Not Using

Unlike the commercial light stands, this one will not fold up when not in use. Since it is tall and skinny, it should fit in a closet without too much problem.

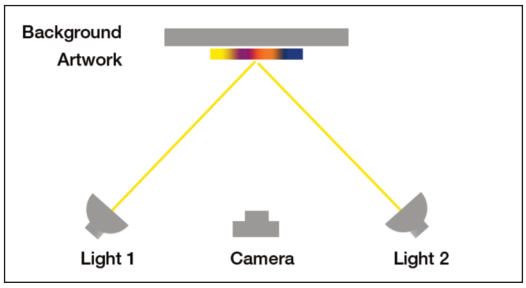
Use Neutral Background

A large sheet of one inch thick styrofoam (wall insulation from Home Depot) covered with Gray photo paper (Glazers Camera) makes a good neutral background. It's sturdy, easy to pin artwork to and doesn't cause color problems.



Place Lights

Lights should be placed at 45 degree angle and 6 to 8 away from the artwork. Note that the lights and artwork form a triangle.



Mount Camera on Tripod

It's important to mount the camera on a tripod so that it does not move during the exposure. The height of the tripod + camera should be at the height of center of the artwork. Lightweight tripods, suitable for small cameras, cost about $50 at BestBuy or Kits Camera. Sturdier tripods can cost considerably more.

Place Color Test Chart in Scene

Place gray card/color chart in scene above the artwork. This will be used later in Photoshop Elements to adjust for accurate color. Costs range from $18 to $60 at www.bhphotovideo. com in NY.


Macbeth Color Chart
$60

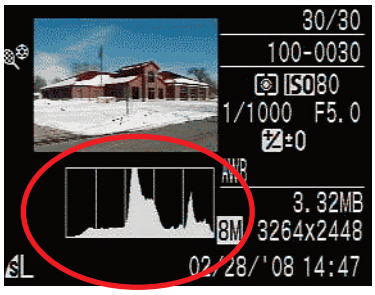

Kodak Q13
$24


WhiBal (8.5x11")
$50


Kodak R27
$18

Set, Shoot, Review and Repeat

Set camera with: Flash= off, AWB=daylight, ISO=100, Aperture Priority=F11, Exposure Time=auto. Shoot a photo. Set camera to play-back and review the histogram, which should have "hill" in middle (not bumped up against ether side). If needed, change the settings in small increments and shoot again. Repeat as needed.

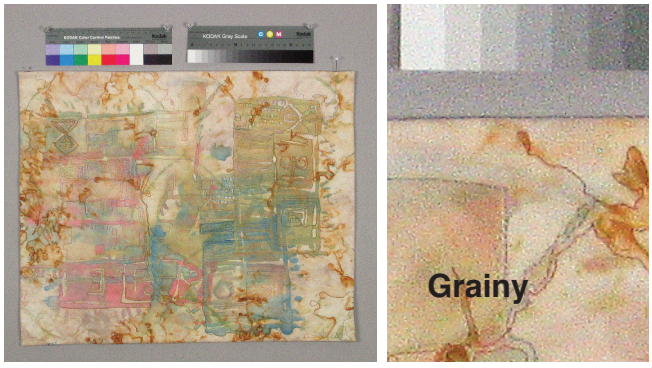


Process Image in Photoshop Elements

Images from a digital camera need to be imported into Photo-shop Elements for processing color balance, set white point, cropping and sharpening.

Shot with 4MP camera and two 5 bulb CFL at 100 ISO

Shot with 4MP camera and two 1 bulb CFL at 100 ISO



Shot with 4MP camera and two 1 bulb CFL at 400 ISO

(NOTE: All samples processed with Photoshop Elements)