

Digital Photography

Understanding the digital photography world. Learn your digital camera, downloading photos, changing settings to comply with art competitions, photo software, and formats for saving art photos, cropping photos for competition entries.

Great digital photography web sites:

www.phototipsandtricks.com

www.photoworkshop.com

<http://digitalphotoacademy.com/> - Classes and workshops

Company web sites with a lot of interesting tips and tricks:

<https://www.learn.usa.canon.com/> – Canon (Consumer – Resources and Learning-Learning Station)

www.getolympus.com - Olympus (Cameras and Audio - Learn and Share)

www.nikonusa.com/ - Nikon (Learn and Explore)

About color management:

www.digitaldog.net (Tips – printer test page)

www.cambridgeincolour.com/tutorials/

Software

Photoshop Elements - \$29 - \$69 on-line

Gimp - Free download from on-line

Picasa - Free download from on-line (My virus protection would not let me download)

Learn Your Camera!

This is the most important step in taking digital photos. You will be missing many advantages of your camera if you don't follow this step.

Go through the Menu on your camera with the manual and learn what each setting means and the setting that best suits the way you will be taking photos. Keep taking photos of everyone and everything until you are completely comfortable with your camera.

Setting your camera! All brands – all models

Resolution: Set the camera to the highest resolution possible for every picture and then reduce the resolution with imaging software if you want to use the photo on the web or send it in an email.

Ratio: Aspect ratio is the relationship of an image's width to height, or its proportions. . Digital cameras produce files with an aspect ratio of 4:3 or 4 pixels by 3 pixels.. But many common photo print sizes have a different aspect ratio. For example, a 4 by 6 print has an aspect ratio of 3:2; an 8 by 10 has an aspect ratio of 5:4.

1:1	Square
5:4	8 x 10
3:2	4 x 6
4:3	4 x 6 - Commonly used

White Balance: white balance in digital photography means adjusting colors so that the image looks more natural. Most light sources (the sun, light bulbs, flashlights, etc) do not emit purely white color and have a certain "color temperature".

Most digital cameras have white balance presets that are set to a certain Kelvin number by the manufacturer. These presets also vary depending on the manufacturer and camera model. Here is the list of presets for most digital cameras:

Taking Photos of your Art!

If possible, put your art in very bright light but without any shadows. Set the camera white balance to the daylight setting. When you are standing in front of the art, make sure your shadow is not being cast on the art.

Auto	Default WB setting and what I use all the time when I shoot RAW. The camera automatically guesses the WB depending on ambient light and use of flash.
Tungsten (Light Bulb)	Use it strictly under tungsten light bulbs or the image will look very blue.
Fluorescent (Glowing Tube)	Use if photos look too green or when under fluorescent lights.
Direct Sunlight (Sun)	Used when shooting outdoors with the sun shining on the subject.
Flash (Lightning Bolt)	Used when using on-camera flash.
Cloudy (Cloud)	Used in cloudy days or in shades. Will yield warmer images than sunlight
Shade (House with a Shadow)	Warmer than cloudy – adding orange colors to the photograph. Good for sunsets and shades.
Continuously Variable (K)	Lets you manually change the Kelvin value from 2,500 to 10,000.
Preset (PRE)	Used for color matching with a white card.

Use a tripod, if possible, to give you the best photo possible. As much as we try to hold the camera still, we still move when we click that button.

Your camera lens must be in the center of the art and at the same angle. Otherwise, you will get distortion of the art and have to crop a lot of your image. Line up the edges of your art with the edge through your viewfinder or LCD so that all edges are straight. **Exclude all mats, frames, easels, etc. when you are shooting art.** Even if the art extends to the mat or frame, this is not part of the actual art and will not be part of the juried photo.

You should take, at a minimum, three photos. Take one photo with the auto setting on your camera, one with a step lighter and one with a step darker. You then have options when looking at your images on the computer. You can delete the images you don't like.

If you need to use artificial light, you need to change your white balance to tungsten light with light as close to daylight as possible. Artificial light, depending on the type, will change the colors in your art tremendously. Most cameras have settings in the white balance menu for daylight, tungsten, cloudy, shade, etc. Make sure you set your camera for the correct lighting.

On Your Computer!

Make a folder/directory for your photos. I suggest an Originals folder and folder for art photos with subfolders for each piece of art as follows:

C:/Art/Originals (This folder would be to save your .tif files)
C:/Art/Photos/Pretty Tree (a folder for the title of each piece of art)

Think of your computer as a gigantic filing cabinet.
C: would be your cabinet.

Art would be the drawer (C:Art)

Originals would be an expandable folder (C: Art/Originals)

Photos would be an expandable folder (C: Art/Photos)

Title of each piece of art would be an individual folder inside your Photos expandable folder. (C: Photos/Title)

After the upload!

When you upload your pictures to your hard drive on your PC or laptop, they will probably save in a .jpg file extension at 72 resolution.

Before you do anything to the photo, save it with a file extension of .tif and save it to a folder with all of your originals. This will be a large file in size but will not deteriorate with use.

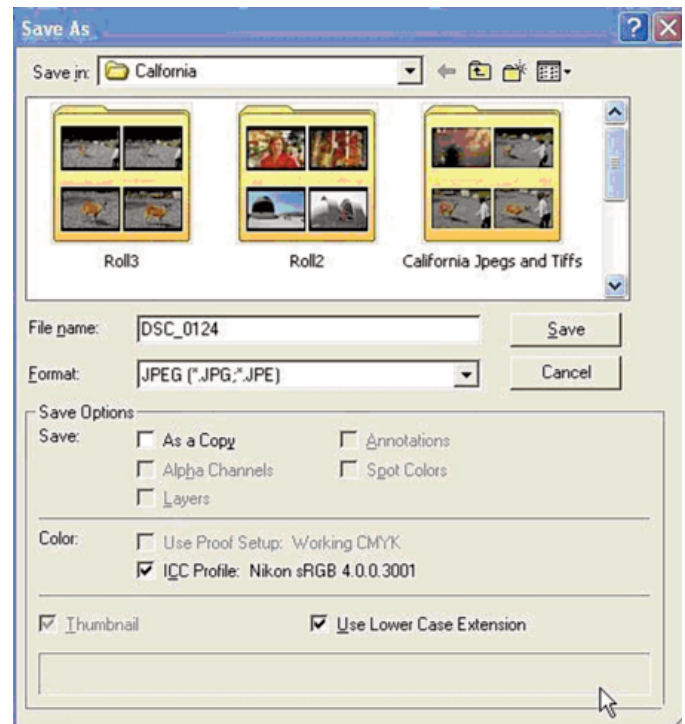
Select File/Save As/

When the window appears on your screen, go to the middle of the window and click on the carrot to the right of the 'Save File As' or 'Format' cell:

Select the format of your choice. For a new file, select .tif or .tiff. For working files save to the .jpg format. Resave to the correct folder.

You will be working on a daily basis with photos with a .jpg extension. The problem with .jpg is that every time you open the file and then re-save, it loses a little of the integrity. Over time this slowly changes the quality of your photo. If you are making changes to the original .jpg that really look more realistic or are just better than the original photo, save what you are working on as a .tif at anytime so that you don't lose all of your hard work.

When you are totally happy and content with your enhancements, save it in the .tif file extension. You can then delete the original .tif or save it for playing with at a later date. I have found that after upgrading imaging software there might be greater enhancement capabilities that weren't available at the time you took the photo.



Technical explanation of .jpg and .tif!

There are two types of file compression, "lossy" and "lossless". Lossy compression actually changes some of the original pixels and some details are lost. The most common type of lossy compression format is JPG. While the original JPG image out of a digital camera is fine, every time the file is saved again, detail is lost. If the same file is saved as a JPG a few times, significant quality is lost and cannot be recovered. Valuable originals should always be saved in a lossless format, like TIFF or RAW. TIFF files can be edited and saved any number of times without loss of detail because the compression does not alter any pixels. The trade off is that TIFF files have a larger file size.

RAW Format!

If your camera has the capability to save a photo in the RAW format, you will get the best photos in this mode. You must have software that allows you to modify and save the file in a different format in order to save and print for competitions, etc. If you decide to work with RAW, read everything you can on your camera and how to manipulate your output. This is for the determined-to-be-a-better-photographer type of artist and will require your time and effort to get the best output.

DPI (Dots per Inch) vs PPI (Pixels per inch)

Before you read the following section, please know that when you are asked to send in your art at 300dpi, the terminology is not correct but every prospectus that I have seen will always use dpi, not ppi. The following will explain the difference but you will continue to send in your entries as 300dpi.

Even though “dots per inch” (dpi) and “pixels per inch” (ppi) are used interchangeably by many, they are not

Megapixels	Pixel Resolution*	Print Size @ 300ppi	Print size @ 200ppi	Print size @ 150ppi**
3	2048 x 1536	6.82" x 5.12"	10.24" x 7.68"	13.65" x 10.24"
4	2464 x 1632	8.21" x 5.44"	12.32" x 8.16"	16.42" x 10.88"
6	3008 x 2000	10.02" x 6.67"	15.04" x 10.00"	20.05" x 13.34"
8	3264 x 2448	10.88" x 8.16"	16.32" x 12.24"	21.76" x 16.32"
10	3872 x 2592	12.91" x 8.64"	19.36" x 12.96"	25.81" x 17.28"
12	4290 x 2800	14.30" x 9.34"	21.45" x 14.00"	28.60" x 18.67"
16	4920 x 3264	16.40" x 10.88"	24.60" x 16.32"	32.80" x 21.76"
18	5184 x 3456	17.28 x 11.52	25.92 x 17.28	34.56 x 23.04
24	6048 x 4032	20.16 x 13.44	30.24 x 24.16	40.32 x 26.88
35mm film, scanned	5380 x 3620	17.93" x 12.06"	26.90" x 18.10"	35.87" x 24.13"

the same thing. Traditional printing methods use patterns of dots to render photographic images on a printed page. While **pixels** on a monitor are square and in contact with the adjacent pixels, **printed dots** have space between them to make white, or no space between them to make black. Color photographs are printed using four inks, Cyan, Magenta, Yellow, and Black (CMYK), and four separate dot patterns, one for each ink. Dots per inch (dpi) refers to printed dots and the space between them, while pixels per inch (ppi) refers to the square pixels in a digital image.

Most books and magazines require 300ppi for photo quality. For example, the chart shows that you can make a 5” x 7” photo quality print from a 3 megapixel camera. Notice that as the print size doubles, the megapixels required increases geometrically. You can make nice 8” x 10” prints with a 6 or 8 megapixel camera, but to make a true photo quality 16” x 20” print, you need between 24 and 30 megapixels. Don’t be fooled by manufacturers’ claims that say you can make 16” x 20” prints from an 8 megapixel camera. While you certainly *can* make a print that size, it will not be **true photo quality**.

Here’s why:

A megapixel is 1 million pixels. It’s an area measurement like square feet.

A typical 8 megapixel camera produces images that are 3266 x 2450* pixels.

If you multiply 3266 by 2450, you get 8,001,700 or 8 million pixels.

To find the largest photo quality image you can print, simply divide each dimension by 300:

$3266 / 300 = 10.89$ inches

$2450 / 300 = 8.17$ inches

*Typical Resolution. Actual pixel dimensions vary from camera to camera.

**At 150ppi, printed images will have visible pixels and details will look “fuzzy”.

Image file size formula:

width * height * color / 1,024,000 = Megabytes (MB)

72 dpi or 150dpi is acceptable for photos that will be uploaded to the web.

Cropping vs. Resolution

Very few photographers get it right on every shot. Most of us take pictures from much too far away and later try to compensate by having just a piece of the image enlarged. This sometimes works out reasonably well if you are using film, but it can be deadly if you’re shooting with a digital camera.

Why? Because every time you throw part of your image away by cropping, you're reducing your camera's effective resolution. In short, you're only getting part of the resolution you've paid for and throwing the rest of those valuable pixels away.

What you've really done by cropping your high resolution image is reduce it to a lower resolution, perhaps to 1024 x 768, or even 640 x 480. In essence, the more pixels you get rid of through cropping, the lower the final resolution of your picture will be, and the less likely you'll be able to get a decent-sized print.

So you might want to try this easy fix until you develop your eye to the point where you can frame your image precisely in the viewfinder or LCD monitor. After you've composed your picture, take a giant step (or more) forward and then shoot. You'll be amazed at the improvement in your pictures, especially those of people. When you photograph houses or landmarks, you may have to take more than a couple of steps. Do it!

Try this practical exercise. Find a willing person who'll stand still for a few minutes. Shoot a picture from the waist up. Then move in for the next shot. Finally, take a third picture you feel is almost too close. Now make prints of those shots, full frame, without any cropping. Which do you like the best? I'll bet it won't be the first photo.

Here's something else to consider. The optical viewfinders of many cameras (both film and digital) rarely give you the real boundaries of the images you'll end up with. To compound the problem, they usually show less of the image than is actually being photographed. So while you may think you've composed tightly and are in close enough, you usually end up with a lot more than you saw, requiring you to lop off valuable pixels to match the image you had in mind when you shot.

The LCD monitor, on the other hand, is a more accurate indicator of what you'll really get. If you use the optical viewfinder to frame a shot, make sure you know what its limits are so that you can compensate by moving in an appropriate amount. To accomplish this, set the camera on a tripod or other stable (and non-movable) surface. Then compare what you see in the optical viewfinder with the image on the LCD monitor. If you have a zoom lens, try it at several settings because the difference may not be consistent throughout the entire zoom range.

While we're on the topic of zoom lenses, cameras with digital (as opposed to optical) zooms lose resolution when they zoom in, much the same as if you'd cropped out pixels in your imaging program. While pixels in the center of the sensor keep working to record the image, the ones at the edges get a coffee break. Optical zoom lenses, on the other hand, keep every pixel on the job when they zoom, assuring that the high resolution you paid for will be delivered.

Learning to precisely frame your images when you take them isn't easy. I guess most of us have a built-in safety mechanism that makes us want to shoot more than we need because we know we can make less from more but not more from less. You'll have to diligently work to overcome the tendency to keep your distance, but once you get used to moving in, the dynamite images you capture at higher resolution will be well worth it.

All of that said, you must crop photos for competitions to exclude anything extra. The tighter you frame when taking the photos, the less you crop.

Making the Changes to 300dpi Resolution!

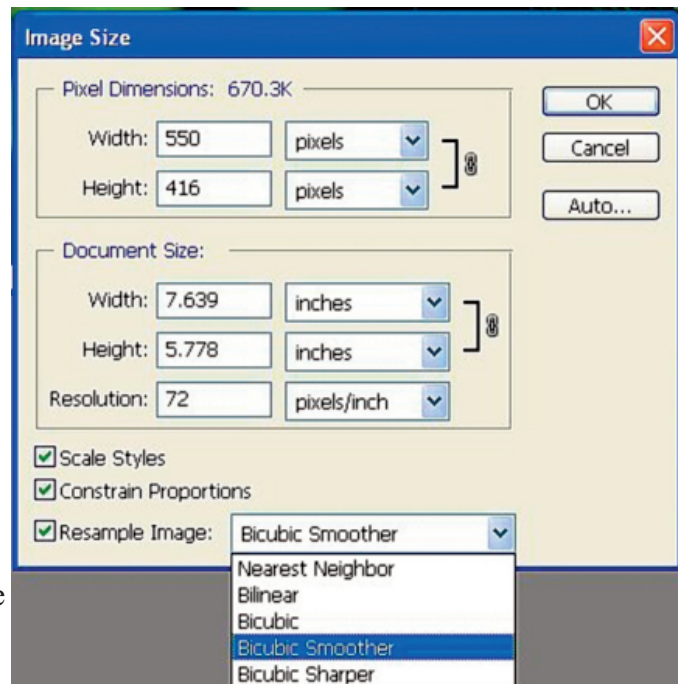
The following is what you will see on your monitor when you select /Image Size. All of the cells will be filled with the information of the photo you have loaded.

At the bottom of the screen, place a mark in the box for each of the three selections: Scale Styles, Constraint

Proportions (will keep the width and height in the correct proportions on your working photo), Resample Image. For best results on most computers set the last selection to Bicubic. If you are curious, you can try the other selections to see what results you can achieve.

Remember, a digital image is literally x number of pixels (h) times x number of pixels (w). You can never add pixels to get better resolution. For the best quality of a printed photo, you should keep the number of pixels the same regardless of the resolution.

Divide the number of pixels in the Pixel Dimensions:Width cell by 300. This will give you the width in inches of the largest print size for 300ppi. In the cell marked resolution, change the number to 300. In the cell marked Document Size:Width, enter the number you derived from dividing the Pixel Dimensions:Width by 300. The Document Size:Height will change automatically to the correct corresponding size for your photo when you have Constrain Proportions selected.

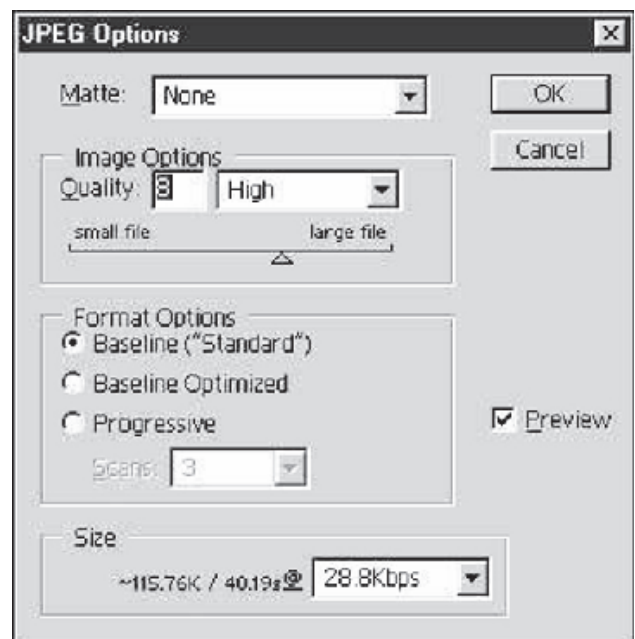


Your photo will resize to meet the new criteria. Select save, you will be asked to select the .jpeg options. This will decide the overall size of your photo file in Megabytes.

For photos of your art, always select the highest quality which is 12. If you are sending by email or uploading for a competition, you can choose a smaller number and then check the file size adjustment that will be listed beneath the 'Cancel' button. If your prospectus states that the file cannot be larger than 2mb, then you can reduce the quality number until the file is less than 2mb or change the Document Size:Width and Height to keep the prescribed size. For the best quality for competition, change the document size and keep the quality in the large or maximum range..

Matching the Monitor to your Prints!

Unless you are extremely serious about your printing, I would suggest you leave the colorimeter to those who print professionally and work on setting your monitor to the best matching with your printer. The first web site listed on the first page will give you instructions on using the colorimeter.



You have two choices. You can ask either your printer's software or your imaging program's software to handle your printing job. If you use the manufacturer's recommended inks and paper, give your printer's software the first shot at it.

Using your imaging software will sometimes give you more accurate results, especially if you are using papers and/or inks that are not in your printer manufacturer's regular arsenal. These third-party products usually come with software profiles, similar to your monitor profile. Written instructions tell you which folder to put them in and what settings to use on your printer when using them. Incidentally, some printer manufacturers also give you the option of using profiles they've produced for their own papers and you'll find them in the Profile Menu under Print Space.

A few helping comments on printing!

Color Smar/sRGB (sRGB is the world's default color space and should give you the most accurate color matching from monitor to printer). Another color setting is Adobe RGB (1998) (You cannot use Adobe RGB on the internet or for email or conventional photo lab printing. If you do, the colors are duller. Experts believe using Adobe RGB is the biggest problem with matching monitor colors to your printer.)

Testing your printer to photo settings.

Take one photo and do the following:

1. Set your print software to print preview. (always)
2. Print with the settings you have. Probably a default setting at the time of installation of your printer.
3. Write on the printout the setting shown on your print management screen.
4. Make one change and repeat the first three selections. Do this for each selection available in your software.
5. Compare the color of your photos with your monitor and the original photo content.
6. Set your software for the best color matching to your original photo and/or photo content.

Setting your print software to print preview will give you the opportunity to see if the colors are printing the way you expect. While testing all the settings this is not real important, but it will be when you want to make quality prints from your photos.

Entering photos of your art in competitions, juried shows, etc!!!!

Most shows will issue a prospectus or entry form with directions for each show. If you do not get the directions, then contact the show contact to get them before you try to send your entry. **Follow instructions** in the prospectus. If you do not understand terms or phrases, contact the show contact or the person listed on the

prospectus. If you are having technical problems with your software or computer, you need to contact your computer technical consultant rather than the show contact. Teaching you how to use the computer is not a show contact's job.

Your image should be saved in an acceptable standard format. If you don't have software that can save your image in the accepted formats, purchase one as soon as possible.

The accepted formats are:

.jpg – standard file format

.jpeg

.tiff – very large file and not suitable for email

There are other formats but not worth your effort for the purpose of shows.

Quality of images. - **One image per file.** DO NOT send an entry file with more than one image. If the show allows more than one entry, attach a file for each entry. Unless otherwise stated in the prospectus, your file name should be your last name, first name initial or name, and the title of the painting in your image. (Example: NeidefferB-Sunrise.jpg)

Size of images - Every show prospectus will give you their required size for their images. Do not send files larger than the requirement. The most used is 1800 pixels per long side at 300dpi. This will be an image approximately 4" X 6" and if saved with a quality of 12 should be near 2mg in size. The instructions that are really confusing are when they ask for sizes that are impossible to achieve. Sometime the only answer is to reduce the quality to 10 or 11 but don't go lower than 10. You will still be in the maximum quality range and have a clear image.

Images should be clean. - No text superimposed on image. This means no title, name, date or any type of text on image. If when you are taking photos, your camera is superimposing the date on your photos, remove that option while taking art photos. No frames, mats, easels, walls, tables, hands, or any other object in the image. Always, always, crop your image to include only the art, even mats and frames where the art extends into these surfaces. This is still over and above the art and not the painting to be juried.

If possible, send your image by email rather than CD or DVD. Many computers still have problems reading the different burn specifications for other computers. This is beyond my powers of explanation to changing your burn settings. If you are familiar with burn options, always set your burn option to close out the CD or DVD. Do not leave it open for additional burning of files when burning for entry into art shows..

It is impossible to cover every camera and printer setting in this handout. Do not be afraid to experiment with your camera, imaging software and your printer. Read your manuals and check for tips and tricks and help on web sites of your manufacturers. It's amazing what is out there if you take the time and effort to look.

In the wonderful age of instant learning that we enjoy, Google or enter into your favorite search engine anything that is of interest to you. The web is full of YouTube tutorials on just about any camera and subject.

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