

DIGITAL HELP (FAQ)

What computer configuration should I use for digital photography?

Your computer should have at least a 10 gigabyte hard drive and at least 256MB of ram. The video card should be able to display millions of colors (a.k.a. 12 bit), and a CD-RW (read & write) drive is a must. Always get the fastest, newest CPU you can afford with the fastest processor. (See the Freestyle Advisor #3 – Digital Prints, Paper & Ink for more on archival storage.)

My printed images look like they have "jaggies" in them. What's wrong?

"Jaggies" are excessive JPEG artifacting which causes images to be blurry. You need to turn up the resolution on your camera. If space on your camera card is a problem, invest in another larger card. If your camera is already at the highest setting, consider a new camera.

My digital camera uses AA batteries. They seem to drain quickly. What can do to save money on batteries?

Invest in rechargeable Nickel Metal Hydride (NiMH) batteries. For a very reasonable investment they last considerably longer than AA alkaline batteries and can be reused hundreds of times. Also limiting the use of the camera's built-in LCD screen will save on battery consumption.

Are there different scanners for Mac computers than for PC computers?

For modern computers the difference is mostly in the software. Scanners generally come with software for both types of computers. Older computers also have different cable connectors. Macs were SCSI and PC's were parallel. For either machines you can often add USB or FireWire cards or buy a cable adapter.

I have an older computer, can I still use today's modern scanners?

If your computer is 1998 or older, you may have sluggish or poor performance from higher end slide scanners and should consider upgrading your system.

My computer doesn't have a USB port. Which scanner should I get?

Today both Macs and PC's utilize USB or FireWire interfaces. If you have an older computer you can buy a cable adapter or a USB card from most computer or electronics stores.

Recommended Text:

How to do Everything with your Digital Camera
by Dave Johnson

The Digital Photographer's Pocket Encyclopedia
by Peter Cope

Digital Imaging A-Z *by Adrian Davies*

Complete Guide to Digital Photography
by Michael Freeman

Freestyle™ Photographic Supplies

Digital Photography: Cameras & Scanners



Freestyle™
Photographic Supplies

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Freestyle Advisor #2

INTRODUCTION

It is no longer a question of when Digital Photography will be a factor in our lives, it is a reality. In just the last few years, incredible technological breakthroughs have allowed digital cameras to make the transition from novelty to serious photographic equipment and office printers into photo-quality print making tools. This Freestyle Advisor will help you understand the basics of digital cameras, digital film media and scanners. It also gives practical knowledge to enable you to make informed choices about what tools and materials you should acquire to make the most of your Digital Photography experience.

Before we start, you need to remember one important thing. Digital is moving forward at an incredible rate due to constant improvements in technology. Before you buy a digital camera, ask yourself these three questions:

1. What am I going to use my digital camera for?
(Email photos to friends/family, print quality photographs, etc.)
2. How can I accessorize my new camera?
3. What are my expectations for my new digital camera?

DIGITAL CAMERAS

With any camera, image quality, features and feel have a lot to do with making your choice. Olympus, Canon, and Nikon all make professional quality fixed-lens cameras with good zoom range that will satisfy the most discriminating photo enthusiast for \$600 or less. Digital cameras are great for communication. The majority of digital cameras are used for taking images to then be emailed, incorporated into presentations, and for instant gratification, as you can preview the image in the built-in LCD screen. Printing your images at home can be a costly venture. Be ready to work a bit and spend a little extra money to get excellent photo-quality images. See our Freestyle Advisor #3 for more information.



Nikon Coolpix 5000



Canon S330 with LCD screen

Not all digital cameras are created equal. To differentiate between one model and another, be aware of the following:

Build Quality - Just like your home computer, the internal components of a digital camera and how they are matched together make all the difference in its use and quality. Digital cameras exhibit certain differentiating characteristics such as shutter delay, file-write speed and image quality. The amount of internal memory buffer a digital camera has will reduce the amount of time it

takes for the camera to write an image to the memory card. Some digital cameras have a short delay in the time from when you depress the shutter button to the time the camera actually takes the picture. Also the image quality of a digital camera from one manufacturer can differ greatly from another brand of equal megapixel spec simply by the quality of the lens and how the camera is put together. When you buy a digital camera, do not sacrifice quality for price.

Zoom Lenses - The scale of focal length in digital camera lenses is different than in traditional 35mm cameras. Therefore the zoom range of digital cameras is usually advertised in traditional 35mm camera lens equivalents. This makes it easier to understand for the photographer making the transition to digital i.e. the Nikon Coolpix 5000, on facing page, technically stated, has a zoom range of 7-21mm on the lens barrel but is equivalent to 28-85mm in a 35mm lens. The more zoom range you have the more flexible your picture taking experience will be. Also digital camera manufacturers advertise cameras with "Optical Zoom" and/or "Digital Zoom." Digital zoom is an inferior substitute for a true "optical" zoom. Using digital zoom can result in lower resolution and poor quality images but the camera will be more compact. If you are only using your digital camera to email images or view them on a computer screen it may not make a difference. If you are planning on printing your images you need to pay attention to the optical zoom range of your new camera.



Olympus D-520 Compact Camera
with 3x Optical & 2.5x
Digital Zoom



Olympus C-2100 at 38mm
Optical Zoom



Olympus C-2100 at 300mm
Optical Zoom



Olympus C-2100 at 1050mm
equivalent using Digital Zoom

IMAGE RESOLUTION SETTINGS AND CHOICES

Cameras offer resolution choices such as low, medium, high and super high quality settings. These choices allow you to tailor your image size (quality) for the purpose you intend to use those images for. A low image quality setting is best used for emailing an image file or viewing on a computer screen. A super high quality image setting will allow you to print the image with greater detail, sharpness and color fidelity. Generally, you want to capture your images at the highest image quality setting you can although you will sacrifice the number of images your digital film card will hold. You can always capture images with a high image quality setting and downsize the image later. You will need to experiment to find the right balance between quality and quantity.

or digital cameras, the term "pixel" or "megapixel" is used to describe the amount of photosensitive diodes on the CCD (charged coupled device) sensor that captures the image information. Generally, the more pixels a CCD has, the more detail (information) your camera can record i.e. a 2.0 megapixel camera inherently has a lower maximum resolution than a 3.0 megapixel camera.

The CCD quality is also important. Quality can vary widely from camera to camera and is defined by how well the diodes, electronics, and microlens all work together. For instance, a great looking scene from a high quality camera will look quality, color-fidelity, and sharpness in a less expensive camera.

Especially for cameras, be aware that not all pixels on a CCD are used for imaging. Sometimes a CCD is larger than the image area created by the lens. Be aware that the camera's advertised resolution is the "Effective Resolution." With cameras, manufacturers will sometimes advertise a maximum resolution that is an Interpolated Resolution. Interpolated Resolution is when you scan an image at a scanner's maximum optical resolution and the file is enhanced by software to achieve a higher resolution.

Quality resolution in both camera/scanner and printer is required for quality results. If a camera has low pixel resolution, no amount of printer resolution can print detail that is not there.

The following chart is a resolution guide for choosing the camera that fits your usage requirements (Keep in mind, technically the Megapixel equivalent of 5mm film is 5 MP):

CAMERA CCD SIZE	MAX PIXEL RESOLUTION	POTENTIAL USE
.3 megapixels	640 x 480	Email & Website
1.3 megapixels	1280 x 960	4x6 - 5x7 prints
2.1 megapixels	1600 x 1200	8x10 prints
3.3 megapixels	2048 x 1536	11x14 prints
4.0 megapixels	3200 x 2400	16x20 prints

MEMORY (Digital Film Media)

Later digital cameras save photos on a removable memory chip a.k.a. "digital film media or camera card"). There are several types on the market but most digital cameras are dedicated to a single type. Currently, the two prominent camera cards are SmartMedia™ and CompactFlash™. These small, postage stamp-sized, cards act like a floppy disk. You store pictures on them, take them out of your camera when full, and put in another one. Erase them and reuse them as needed. The difference is that these memory chips have no moving parts, so they are very durable, and come with large capacity.



SmartMedia™



Compactflash™

SmartMedia™ Cards are currently available in 8MB, 16MB, 32MB, 64MB & 128 MB sizes. They are thin, about the size of a postage stamp and are very durable.

Compactflash™ cards are available in 8MB, 16MB, 32MB, 64MB, 128MB, 256MB, 512MB and at the moment, even up to 1 Gigabyte. They are in a wafer configuration and are available from some companies in a variety of speeds.

WHAT IS COMPRESSION?

For digital cameras, one of the trade-offs for having high pixel resolution is large file size. Only a few pictures can be stored on a single camera card, even a card of large capacity. A high-quality, 2 megapixel camera, at maximum file size can yield a file 5MB large. To compensate for this, cameras can "compress" images using a common compression method called "JPEG" or ".jpg". Cameras using JPEG compression algorithms simplify the image by throwing color and detail away after recording them in a data table. Later, when you view your pictures on your computer, the compressed file "remembers" what the original looked like and remakes it. But the JPEG algorithms are not perfect, and the more you use them (i.e. the more you compress) the greater the number of translation errors that occur. All JPEG compressed files have more abrupt highlight color graduations, and over-compressed photos lose sharpness, have jagged lines and gain strange swirling patterns called "artifacts". Think of compression as crushing an eggshell and gluing it back together. In the rebuilding process tiny bits are lost, glue smudges and the shape is never quite smooth. The more you crush it the worse it gets.

Almost all digital cameras give you low, medium and high quality options, and good cameras have an uncompressed (TIFF or raw file) option as well. Always use the minimum amount of compression for your needs. You may not see a difference when printing an image that was originally captured in an uncompressed mode vs. a compressed mode. Test your camera for best results.

Understanding resolution and file size will allow you to select the appropriate compression option your camera offers in order to maximize image quality and number of images you can store on your digital film media.

For instance, with a 2.1 megapixel camera you can get the following approximate number of images on a 16MB card (*Detail in the scene is a major factor in file size*):

Camera Megapixels	Resolution Setting	File Size	Approx. Number of Images
2.1	TIFF (uncompressed)	5.5 MB	2 pictures
2.1	Best JPEG quality	1.2 MB	12 pictures
2.1	Medium JPEG quality	450 KB	32 pictures
4.0	TIFF (uncompressed)	11 MB	1 picture

DIGITAL FILES ARE JUST SOMETHING TO LOSE!

Remember that digital film media is temporary storage. Move your pictures to your computer as soon as you can. Accidentally erasing pictures is common, plus their small size makes them easy to lose. When not in the camera, protect your cards with a storage case or media wallet.

Every digital camera comes with a cable to connect to computers. Use an external camera card reader instead. It's faster, easier and very convenient. Some cameras use special software to download images to the computer, some load like a hard drive. Make sure you know the difference.

A card reader is roughly the size of a mouse and acts like a floppy drive. When you put your camera card into the slot you can access it from your computer. For a few dollars more, invest in a dual card reader that can handle both Smartmedia™ and CompactFlash™ in case you upgrade or change cameras in the future. If your computer of choice is a laptop, get a PC card adapter. These let you utilize your PC card slot to transfer images to and from your computer.

DON'T PRESS THE DELETE BUTTON YET! PRINT YOUR PICTURES!

When we take a traditional roll of film to the lab, we get back every picture on the roll - good, bad, overexposed or underexposed. That picture of Uncle Al with his slice of cake slipping from his plate is one example of an image you might delete immediately. He doesn't notice, but everyone else at the table is looking at the cake, not at the camera. It is not the shot you wanted but it's now recorded on your digital film media and it's priceless. Sometimes the outtakes are the best and you don't realize it until after the fact, maybe years later.

Digital cameras let you delete any picture immediately. Also since your files are stored on a computer or other magnetic media, it is easy for you to lose those images by accident. This raises the real danger of forever losing the very best of your photos. It is important to keep everything you shoot - at least for a time. Make sure you print as many of your images as possible and make sure you use the best inkjet paper you can afford. You don't want your memories to fade after a few months or years. (See *Freestyle Digital Advisor #3 for helpful hints and tips on printing your photos.*)



Hakuba Digital Media
Luggage



Unity Digital Dual Slot
Digital Film Card Reader

SCANNERS

One of the best ways to make the film-to-digital transition is to invest in a scanner. Scanners allow you to take advantage of digital storage and printing without giving up your film-based equipment. They also allow you to move your existing body of work to digital format. To choose the best scanner for your needs, you should understand a few concepts:

Flatbed or Film Scanner

Generally, flatbed scanners are less expensive than film scanners because the CCD's resolution is lower. Not a real concern since enlarging requirements are lower (usually 2x at most). Expect to pay \$200-300 for a 1600 to 2400 dpi optical (not interpolated) resolution flatbed scanner. Many flatbed scanners also come with a 35mm film adapter, but in order to get an 8" x 10" print from it you have to enlarge it 8 times or more reducing your resolution by 8 times or more.



EPSON Photo 1650
Flatbed Scanner

Because of the enlargement issue, dedicated film scanner resolution needs to be very high and range from 2720 to 4000 dpi optical resolution. This drives up the price so you can expect to pay \$399 to \$2000 dollars, but for quality 35mm scans the investment is well worth it.

Bit Depth Scanners, like most digital cameras, use an RGB color space. The greater the bit depth, the more colors the scanner can recognize. The minimum acceptable bit depth is 24 which recognizes 16 million colors. But a 36 or 48 bit scanner (recognizing trillions of different colors) is preferable. Note: Adobe PhotoShop can handle 48 bit color, others like Adobe Elements only handle 24 bit.



Canon Canoscan FS2710
Film Scanner

What to buy? Buy a flatbed scanner if you have a lot of prints without negatives or are on a budget. Buy a film scanner when you have primarily slides and negatives. Buy a flatbed scanner with a film attachment when you do not plan to use your slide scans as client end-products. Brands to look for in flatbed scanners include Epson and Microtek. Quality slide scanners generally come from Nikon or Canon. These scanners often come bundled with professional software like Digital ICE (for automatically removing scratches and dust), and PhotoShop LE.