Guide to Digital Cameras

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Part 1 – Digital Cameras

There is a wide variety of digital cameras on the market and this grows and changes daily. What camera should you buy is a difficult question because it depends upon two factors: How much money you wish to spend on a camera and the type of photography you wish to use the camera for.

There are three types of popular consumer-based cameras:

1. basic point-and-shoot cameras,
2. compact cameras, and
3. DSLR (digital single lens reflex) cameras.

The major difference between the first two cameras and a DSLR camera is that with the DSLR camera allows you to change the lenses, while the first two – basic point and shoot and compact cameras – the are fixed.

Point-and-Shoot Cameras

Point-and-shoot cameras are the cheapest and most common digital cameras. The use of this camera reflects its name – pick up, point and shoot an image.

These cameras do not have a lot of advanced features such as White Balance, variable focus or ISO controls. The cameras shoot generally in Automatic mode, which means the camera sets the exposure settings for the photos.

Advantages

- Relatively inexpensive, ranging from $100-$400.
- Lightweight,
- Convenient to use

- Quite small so can be easily carried in pockets or bag
- Point and Shoot cameras generally have lens that support a range of focal lengths, from wide to medium long.
- Automatic features help users take photographs.

Disadvantages

- You cannot change the lens on these cameras so you cannot use external accessories like an external flash unit.
- Shutter speed can be quite slow so you may end up with some blurry shots when trying to take photos of action events.
- May have no or very small LCD screen for reviewing images.

Point-and-shoot cameras are a good buy if you are simply trying to get photographs to keep of special occasions. These cameras are great for family, social and general photos.

Compact Cameras

Compact cameras are similar to point-and-shoots but are a little larger than point-and-shoot cameras. They generally have a higher zoom and exposure range, and a larger LCD screen. Prices range from around $400 to around $700.

Advantages

- Camera controls are easier to access because they mostly have controls on the camera housing.
- These are physically larger than point-and-shoot cameras and so provide a better grip on the body of the camera.
- Affordable and generally cheaper than the lower level DSLR cameras.

- The compact camera's lens has a range of focal lengths, from wide to medium long.
- Often includes a range of additional features not included in point-and-shoots, e.g. video capture.

Disadvantages

- You cannot change the lens on these cameras so you cannot use external accessories like an external flash unit.
- Shutter speed can be quite slow so you may end up with some blurry shots when trying to take photos of action events.
- The cameras are heavier and more inconvenient to carry.

DSLR Cameras

DSLR cameras allow you to change lenses and have variable (and fast shutter speeds) thereby allowing greater opportunity to capture movement in photographs.

Advantages

- DSLR cameras have the ability to use a wide variety of lenses, from extremely wide and to very long zoom lenses.
- Camera operation is significantly faster with little or no delay in exposure between shots.

- An external flash may be attached to these cameras thereby enhancing the lighting opportunities for taking photographs.
- A wide range of variables that allow the user to fine tune taking a photograph to suit needs and circumstances.

Disadvantages

- DSLR cameras are expensive, starting at around $800 and going very high into the thousands of dollars.
- Cameras, lenses and associated equipment can be bulky.

Part 2 - Basic Features to Consider When Buying a Camera

Many people shoot in what is called Automatic mode, which allows the camera to make all the settings for you. This part of the guide describes some basic features you will want to consider when purchasing a camera. Or if you already have a camera, you will want to be familiar with these features.

Megapixel/Memory Size

Many camera buyers think the higher number of megapixels a camera has, the better the quality of photos. That is not quite true. Megapixel size is about the size of the prints you can make with a typical resolution of 240ppi. If the megapixel size is not correct, the resulting images will look blurred and not crisp.

You want to make sure that camera you purchase will be at least 3-5 megapixels, which enables you to make 4x6 to 8x10 prints. Most cameras will start at this size. If you wish to print out larger photo prints you will need to have at least an 8 pixel size camera, or larger.

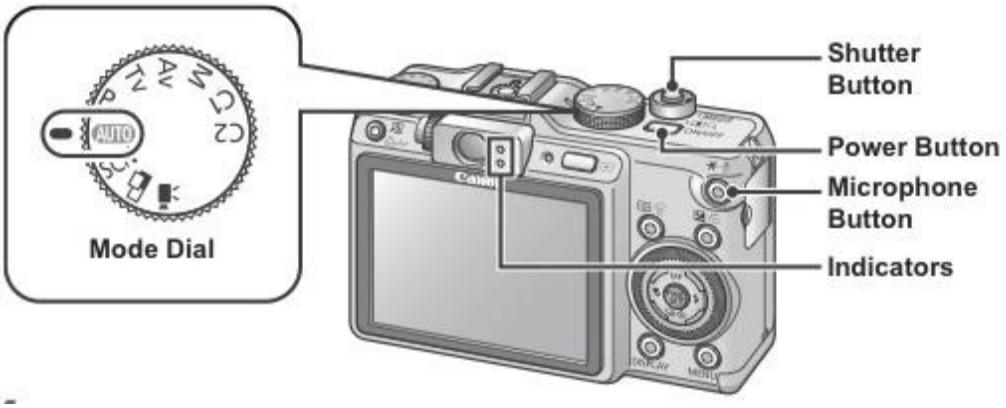
Remember though if you take a photograph with an 8 megapixel camera, the image files will be two to three times larger than if you took the same photograph with a 3 megapixel camera.

Image Stabilization

Cameras can include image stabilization which helps reduce the blur that occurs from the movement of a camera or subject. You still try to steady your shots, but image stabilization can often assist and or warn you when the ambient light for the shot is too low or when the camera is having difficulty focusing on the subject.

Menu Controls

When checking out a camera, check to see how easy or difficult it is to get to and understand the different control features. If you plan on using your camera a lot, beyond the simple point- and-shoot mode, you will want camera controls to be easily accessible. The best is when a camera's exposure setting (aperture, shutter speed, and other modes) can be accessed from controls outside the camera and not from a hidden menu through the LCD screen.



Before buying a camera, take some sample shots with it, and notice what type of information you can see before and after you take a photo. Does the camera show information about exposure settings in the LCD screen? What and how many buttons do you have to push to see that information? In general is the information easily accessed?

Optical Zoom vs. Digital Zoom

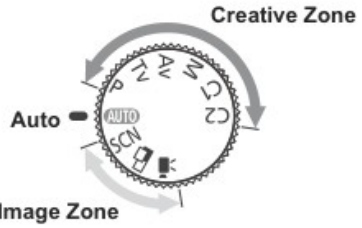
Point-and-shoot and compact cameras are often advertised as having digital zoom (e.g. 3x or 4x).

Digital zoom is not the same as optical zoom. Digital zoom means that the subject in the camera is enlarged almost like when viewing something through magnifying

glass. The resolution and focus is not as good as if you had taken the same subject using an Optical zoom.

Always shoot in Optical zoom if possible.

Manual Exposure Features



If you are looking to do advance photography, check to make sure your camera includes manual exposure capabilities, which include full manual exposure, aperture and shutter priority, wide ISO range, and flash compensation. These advance features are a part of compact and DSLR cameras. You cannot use these features when you're shooting in Automatic mode or some preset modes, such as night or portrait mode.

With advance features you have more control over certain shooting situations.

RAW Capabilities

If you plan on doing processing of your photos in programs like Photoshop, you will want to make sure your camera can shoot in RAW, as well as JPEG mode. All digital cameras shoot in JPEG mode, but not all, especially point-and-shoot cameras, can shoot RAW photos.

The difference between the two modes is that with JPEG some image data is compressed in each shot, which makes for a smaller image file, whereas with RAW photos all image data is retained. Images shot in JPEG and RAW modes don't look any different. But when you're processing photos in an RAW image editor, you have more control over making changes to White Balance, exposure contrast, saturation, sharpness, and other settings.

The biggest problem with RAW photos is that the files are a lot larger and fill up memory cards very fast. You also must use a RAW image editor to process RAW photos.

Other Resources

RAW, JPEG and TIFF: This article explains the difference between these three shooting modes.

Part 3 - Essential Accessories for Your Digital Camera

Additional Media Card

Generally all cameras will come with a memory card, but these generally have limited memory storage. Most point-and-shoot and compact cameras will use some form of Secure Digital (SD) or SmartMedia (SM) cards, while DSLR cameras will typically use CompactFlash cards.

Most contemporary digital cameras start at 8-12 megapixels, which create relatively large size image files. So you will want to have a few memory cards of a minimum of 2 to 8 gigabytes in size. If you are shooting in RAW mode, the file sizes can be 3 to 5 times larger than regular JPEG images files.

The larger the size of a memory card the more image files it can hold. Sometimes you are better having several smaller sized cards rather than one large card as this means a failure will not cause you to lose all your images.

Backup Battery

Camera batteries come in various makes and sizes, from Lithium-ion batteries to standard alkaline AA or AAA batteries. Alkaline batteries are typically used for point- and-shoot cameras and external flash strobes. Because cameras and flashes can eat up batteries very quickly, it is best and more cost effective to use rechargeable batteries.

Any DSLR camera you purchase should come with a rechargeable battery and battery charger. You should purchase an additional backup that can be used in your DSLR camera.

Part 4 - Features You Should Know About Your Camera

With even the most simple and inexpensive camera you can get great photos. Simply by thinking about what you are doing and knowing a little about your camera, your photos can be very special!

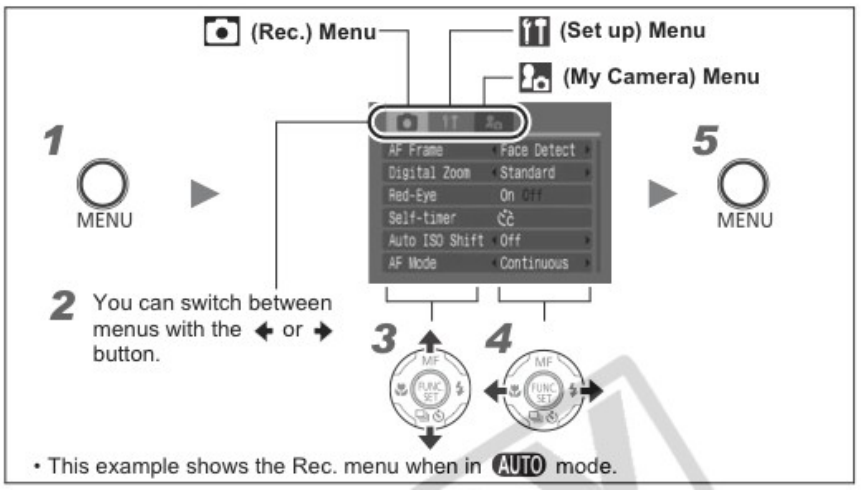
The following hints are best understood if you take out your camera and its manual and try out the suggestions as you read this section. If you don't have or can't find your cameras manual, you can go online and download a PDF copy of it from the manufacturer's site or on http://www.manualsonline.com/.

Basic Settings

Setup Menu

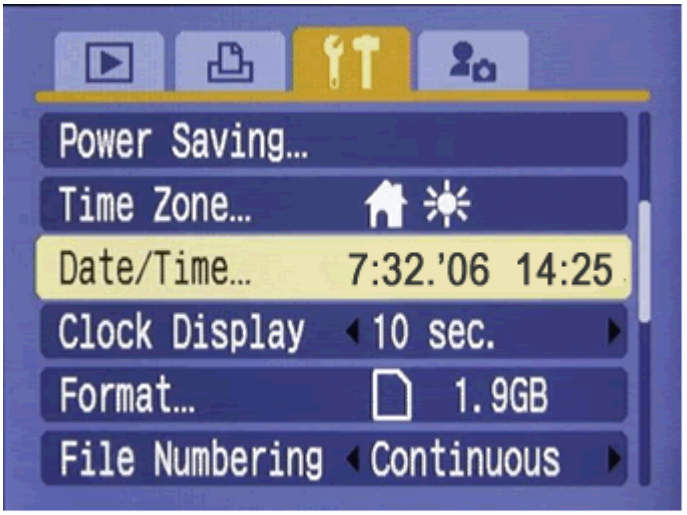
Know how to find the setup menu on your camera. Like computers, cameras come with default settings that you can customize for your particular needs or the way you shoot. Look in your manual to find out how to access your camera's setup menu. Notice what kind of settings you can change with the control dials on your camera and the menu settings that you can access and select through the camera's LCD screen.

Some cameras, for example, will allow you to change the exposure mode of the camera with a dial on the top or on the back of the camera, while smaller pocket- size cameras will require you to open a menu setting in the software to make those changes.



Date and Time Stamp

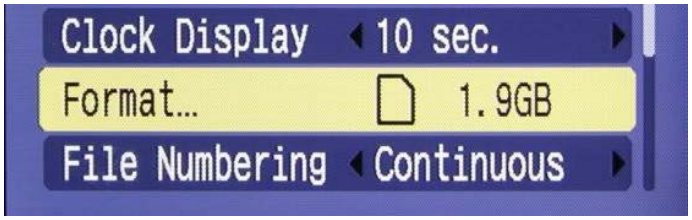
Always make sure your camera is stamping the correct date and time on your image files. This bit of information (or what is called "metadata" in the digital world) can be very useful for archiving and managing your photos.



Picture Count

If you never want to miss a good shot, you should know where to find the picture count on your camera. Generally the image number can be seen on your camera's LCD screen when you review the images. Based on the size of your card and the resolution settings you are shooting in, the camera will display the number of photos shot and how many you more you can shoot with the inserted media card.

Format Your Media Card



There are two ways you can delete images from your media cards. You can delete (trash them) or you reformat your card to wipe clean image data completely. It is okay to simply delete/trash your images after they have been imported and backed up on your computer or other storage device, but after using your cards for several shoots you should reformat your cards.

Check your camera's manual under the keyword "format" for instructions on how to do this.

Avoid filling up your media cards completely. Change the card when you have 10-15 possible images left.

Turn the Flash On/Off

Most cameras come with a built-in flash. Your camera's automatic features may cause this flash to go off when you don't want it to. Learn how to manually shut off and turn on your camera's built-in flash.

If your photos are coming out a little blurred it means that you may need to use the flash or increase the shutter speed on your camera. If you can't adjust your shutter speed then try turning on the flash as that will automatically increase your shutter speed to 1/60th of a second, which is a better speed for holding a camera than at say a slow 1/10th of a second.

Built-in flashes also lead to what is called red-eye in subjects. Though some cameras come with a red-eye reduction feature, it doesn't always work because the built-in flash is shooting light directly into the eyes. Some cameras can adjust for this and others allow for it to be removed from the photo during the review phase.

Shooting Beyond Automatic

Most beginning photographers shoot in Automatic mode. This is generally shown on a dial on your camera with a green "A" or "Auto" icon. When you shoot in automatic mode you are instructing the camera to make all the decisions about exposure settings when you take pictures. Your camera will make the best guess about exposure settings based on the amount of and type of light hitting the camera's sensors.

Part 5 - Taking and Editing Photos

Exercise1: Shooting Close

Take a look at photos you have taken in the past and compare them to photos in magazines taken by professional photographers. The one big difference you might notice between your photos and the ones taken by professional photographers is the subjects of your photos may not fill up the frame. Often, amateur photographers tend to shoot far away from their subjects, leaving too much dead space in the photo.

So practice shooting up close and filling up the entire frame with the object you are taking the photo of. Zoom in with the lens or physically move closer to the subject. With digital photography it won't cost you any more money to take several photos of the same subject, so practice shooting at various focal lengths and notice how close-up shots tend to look better.

Exercise 2: Learn Exposure Compensation

If you don't have a basic understanding the exposure features of your camera (e.g. shutter and aperture settings), at least start learning about exposure compensation. Look the term up in your camera's manual, and then take photos using various exposure compensation settings.

Exercise 3: Take Candid Shots

At the next party or event you attend, or at a family outing, practice taking candid shots. Too often we only take photos of people posing for us. This is alright, but candid, non-posing shots make for great images. With digital photography you can take as many photos as your media cards will allow, so shoot freely and get rid of the unwanted photos later.

Remember: The purpose of candid photography is not to demean or embarrass your subjects; it is to take great photos.

Exercise 4: Shoot for Exciting Colour

Capturing rich coloured subjects can often make for great photography. Try going out and shooting in public places, of subjects rich in colour such as signs, storefronts, and graffiti. Nature shots including colourful flowers are great for colourful shots.

Part 6 - Software for Editing Your Photos

Before digital photography, film-based images had to be processed in a darkroom or taken to a film processing shop. The skills required for processing negatives and producing prints was and still is very expensive. When negatives were dropped off at a photo shop, they were typically processed in a machine with very little or no manual editing of negative or prints.

Digital photography has changed all that. Learning to edit photos can actually help you take better photos.

Those who shoot with point-and-shoot cameras may often take their media cards to a small in-store photo service (e.g. Officeworks), and have those photos uploaded and processed straight from the card. But the alternative can be great when you use software in your computer to help you manage, organize, and edit your images.

Software enables you to do many things including cropping and resizing your images, increasing the brightness and adding contrast to your images; enhancing the colours, and converting colour images to black and white.

Camera Manufacture Software

Often image editing software is included with the camera you purchased. However software provided by camera manufacturers is often not easy to use.

The various options for image editing software include:

Online Editing Software

There are also a few online editing applications and services, such as Photoshop.com, in which you can get a lot of your basic editing needs done (e.g. cropping, exposure correction, colour enhancement and grayscale conversion.) Online editing, however, is typically too slow of a process for large quantity jobs, of say fifty or more photos.

Popular Editing Software

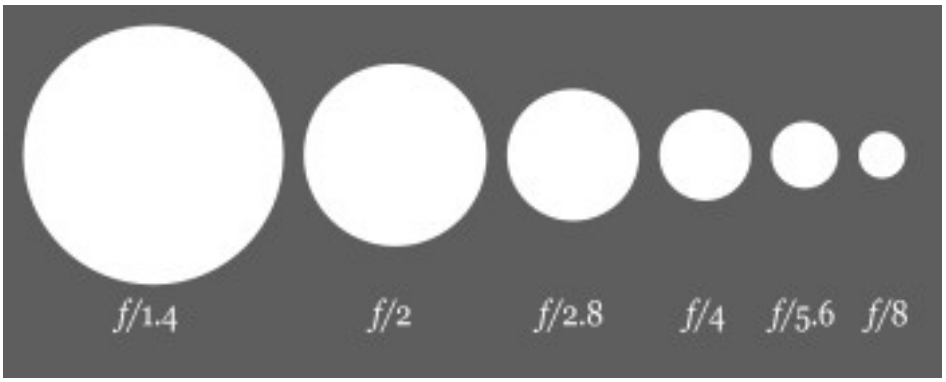
There are several image editing programs for Mac and PC users. They include Apple's iPhoto program, that comes installed with Mac OS X software.

For PC users, there is Window's Photo Gallery software, useful for basic photo management and editing solutions, including cropping and resizing images; fixing images that are too dark or too light; fixing red-eye problems, and titling, tagging, and organizing your images into folders.

GIMP is another image editing program that can be downloaded for free. The program has been around for a while and many online tutorials and printed resources are available for learning the program.

Glossary

Aperture: The amount of light coming through a hole in the camera. The hole is based on f-stops, e.g. f/4.5, f/5.6, f/2.8. Remember: The higher the f-number, the smaller the hole. So f/4.5 allows in less light than f/2.8 or f/1.4.



Aperture Priority: When camera is set it aperture priority, it means that you will set the aperture, and the camera will set the corresponding shutter speed.

Autofocus: A camera setting in which the camera does the focusing for you.

Automatic exposure: In this mode, the camera makes all the exposure settings based the light coming into the camera.

CompactMedia card: A flash memory card largely used in DSLR cameras. It stores the photos you take with the camera.

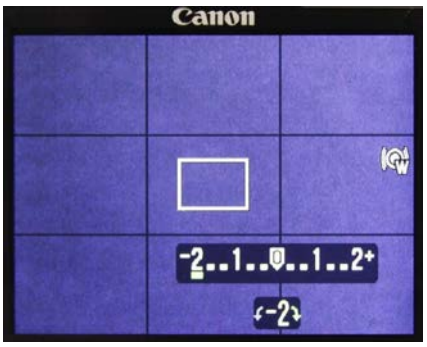
DSLR: Digital Single Lens Reflex. This is a digital camera that accepts interchangeable lenses.

Depth of field: Refers to the amount of focus between the foreground and the background of in a photo. A shallow depth of field means that there's less focus on the background and more focus in the foreground.

Digital zoom: A feature of the camera that allows you to get closer or pull back from the subject zooming in or out with the camera's lens. Optical zoom is preferred over digital zoom as with digital zoom it is not a true magnification.

Exposure: The setting for how much light is allowed to come into the camera and for how long.

Exposure compensation: A feature used to adjust the amount of light coming into the camera.



Focal length: The length of distance from the lens to the camera's sensor. So a 200mm lens will reach the distance of a 200mm.

Hot shoe: A part on the top of a camera, typically DSLR cameras, on which you can attach a flash or strobe.

ISO: It is an acronym for International Standards Organization. In relation to digital photography, it refers to the sensitivity of light that hits the camera's sensor. The higher the ISO, the more sensitive it is to the light.

Image Stabilization: A feature in a digital camera that helps to stabilize the slight movement of the camera when the shutter is activated. It helps reduce, but doesn't totally prevent, blurry shots.

JPEG: JPEG (Joint Photographic Experts Group) refers to a commonly used shooting mode of what is called lossy compression for photographic images. In this mode, pixels are compressed to allow for more images to be recorded on a camera's media card.

Live View: A feature on newer digital cameras in which use the camera's preview screen to view and compose a shot, as well as get a preview of how the image will be exposed.

Macro photography: Close-up photography.

Media or memory card: A card device that holds the digital images you make with your camera.

Megapixel: Refers to the amount of resolution in an image file. A megapixel means one million pixels. For example, 3 megapixels means 2048 x 1536 megapixels.

Optical zoom: The zooming feature on most compact digital cameras. The internal glass of the lens brings the image closer and records it at full resolution. This zooming feature is better and much preferred over what is called digital zoom.

Overexposed: Means that too much light was allowed into the camera, leading to a loss of details in areas of the photo.

Point-and-shoot: Typically a palm-size camera with minimal controls generally used in automatic mode.

Preview screen: Screen in the back of the camera where you can review photos after they are shot.

RAW: A shooting mode, unlike JPEG, in which there is minimal data is compressed or processed. RAW files must be processed using an RAW image editor, such as Adobe Camera RAW, installed with later versions of Photoshop CS and Elements.

Red-eye: The effect that a built-in flash when it is reflected on subject's eyes.

Resolution: Refers to the amount of detail that is captured by a camera's sensor. For example 640x480 is low resolution, useful for web and email size images. 2240 x 1680 (4 megapixels) is much higher quality, which means that you can make larger prints at that size.

SD Card: (Secure Digital card) A flash memory largely used in point-and-shoot and compact cameras.

Self-timer: A feature in digital camera that allows you to set a time for when the shutter will be activated. This is useful for taking self-portraits.

Shutter Priority: When camera is set it shutter priority, it means that you will set the shutter speed, and the camera sets the corresponding aperture speed.

Shutter lag: An issue with point-and-shoot and compact cameras in with there may be up to a second or two lag between when the camera's shutter can be activated after a shot is taken.

Shutter speed: Refers to amount of time the shutter remains open to let light into the camera. Shutter speeds can be very slow, such 2 seconds, or very fast, such as 1/2500th of second.

Underexposed: Means that a photo is too dark. Not enough light was allowed to enter the camera, resulting in a loss of detail in some areas of an image.