

LESSON 1 HANDOUT
INTRODUCTION TO PHOTOGRAPHY
Summer Session – 2009

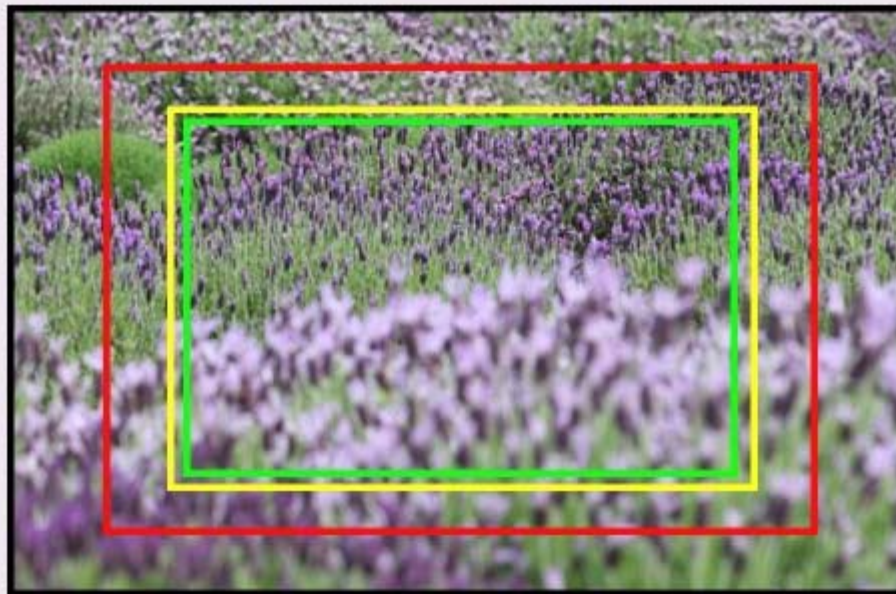
Session #1, 17 June 2009

CAMERAS:

There are 2 major types of cameras, point and shoot and Single Lens Reflex. The point and shoot cameras range from simple (Canon Elph) with minimal controls over your pictures to SLR cameras which can control all aspects of your pictures. Besides the ability to change lenses, the one major advantage of the SLR is the ability to shoot photos in rapid succession in low light situations and varying ISO or shutter speed settings. Pixel count is not the most determinate factor of picture quality. Pixel and sensor size are more important in determining how detailed a picture will be.

In SLR cameras, there are Crop and full frame cameras based on the sensor size. Crop cameras are the Nikon D80, Nikon D300, Canon 50D. Examples of full frame cameras are the Canon 5D, and Nikon D700.

Crop Factors Explained



Black - Full Frame
Red - 1.3x Crop Factor
Yellow - 1.5x Crop Factor
Green - 1.6x Crop Factor

CAMERA CONTROLS

Main camera controls you should remember:

“P” = **Program Mode**. is the most commonly used mode on the SLR. In “P”, most adjustments are automatic but you can adjust the aperture, shutter speed, focus points, ISO and flash.

“A” = **Aperture priority** – Adjust aperture to soften background details or increase depth of field to bring both main subject and background into focus.

“S” or “Tv” is **shutter priority**. “Tv” stands for time value. Choose a fast shutter speed to freeze action or slow shutter speed for blurring when taking water falls.

“M” = **Manual**. You are able to adjust aperture, shutter speed, ISO and any other camera control.

The preset camera modes – action, landscape, macro, portrait, night portrait adjust the camera for the conditions but may not give the most optimum picture.

STORAGE MEDIA (Digital Film)

How to Buy Memory Cards for a Digital Camera

The [flash memory](#) card has replaced film as the primary storage device for photos, but there's more to choosing the right card than knowing the proper format for your camera. Depending on the camera and the card, you might be able to store either 12 or 700 pics at once; snap 20 shots in rapid succession, or have to wait around after each one.

Step 1: Determine the Format

1. Consult your camera's manual.
2. If you cannot locate the manual, look on the cap of your camera's memory card slot.

You should find an insignia specifying the card format. The most common are:

- **CF** ([Compact Flash](#))
- **SD** ([Secure Digital](#))
- **xD** ([Extreme Digital](#))
- **MS** ([Memory Stick](#))
- **MMC** ([MultiMediaCard](#))
- **SM** ([Smart Media](#))

Step 2: Choose the Right Storage Capacity

A roll of film can store as many pictures as the number of exposures it contains, but memory cards are less clear cut. The exact number of images a card can store depends on a combination of its storage capacity and the resolution capability of your camera.

1. Determine the resolution capability of your camera.
 1. Resolution is measured in megapixels.
 2. If you can't find your camera's megapixel count in the manual or noted on the camera itself, refer again to [Digital Photography Review's camera database](#).
 3. Record the megapixel count on a piece of paper.

2. Determine the ideal memory card storage capacity for your camera.
 1. Storage capacity is measured in megabytes (MB).
 - A gigabyte (GB) is equivalent to a thousand megabytes.
 - A card with 128MB is a low capacity card, while 16GB is very high capacity.

Step 3: Choose the Write Speed

Write speed indicates the amount of time a card takes to store an image. The slower the write speed, the longer you'll have to wait between shots, but the difference can be negligible.

X Increments

- If you've ever burned a CD, you may be familiar with figures like **8X** or **12X**. These are **X increments**, which note the amount of memory a device can store per second. A memory card's card's write speed is also measured in **X increments**.
 - **1X** is equivalent to 150 [kilobytes per second](#).
 - **4X** is considered a very slow write speed.
 - **40X** is sufficient for most [point and shoot](#) camera users.
 - **150X** is about highest speed of any card currently on the market.

Usage

- Depending on your camera and the kind of photography you plan to do, you may not see much benefit from a high speed card. A card marked higher than 40X will be of [greatest use](#) for the following applications:
 - **DSLRs** can operate significantly faster.
 - Digital SLRs have high megapixel counts and a larger sensor than [point and shoot](#) cameras, factors which increase the amount of data required to store for each image, slowing down the process.
 - **Action shots** can be made in faster succession.
 - If you want to catch take [sequence of an athlete in motion](#), a high speed card can allow you to make quicker and more frequent bursts of snapshots.
 - **Movie mode** is enhanced.
 - If you shoot short movies with your still camera, a high speed card will allow you to record more smoothly and for a [longer](#) period of time.

POST PROCESSING

Today, 50% of photography is post processing. With post processing, you can crop, correct colors, resize and improve picture quality. Almost all software used to process pictures have the basic controls of auto adjustments, reducing redden, sharpening, cropping and resizing.

Examples of software would be:

Adobe Photoshop, Corel Photopaint, Adobe photoshop elements and numerous other software. A feature comparison can be found here:

<http://photo-editing-software-review.toptenreviews.com/>

Basic workflow from camera through post processing to putting pictures on USB to bring to class. Example of using Adobe Bridge to rank pictures for selection.

Links for this lesson:

Photography basics –

<http://www.tutorial9.net/photography/photography-basics/>

<http://www.tpub.com/content/photography/14209/>

<http://www.photo-seminars.com/>

<http://www.usa.canon.com/dlc/controller?act=HomePageAct>

<http://www.nikonusa.com/Learn-And-Explore/Nikon-School/index.page>

Extra Study Materials:

<http://digital-photography-school.com/>

<http://www.photography101.org/basics/index.html>

Memory Cards

<http://www.digicaminfo.btinternet.co.uk/memorycards.htm>

There are currently seven different basic memory card types made for use with digital cameras, with some more popular than others. There is also another type of storage used, Microdrive, which as its name suggests is a miniature hard drive, which although popular in early digital camera days when memory card capacities were low, seems today to have almost disappeared, as with early memory card formats.

As an integral part of the digital camera system memory cards have a vital role to play, indeed digital cameras are useless without them, so choosing a camera without paying close attention to the type of card it uses can often lead to disappointment. It is also the case that in these days of high resolution sensors and fast frame per second rates - fps - choosing a memory card with the right performance level, one that can read/write at high speed, is as important as the performance of the camera itself. Using a 'slow' card with a fast/high resolution camera will hinder and restrict it's speed of use.

Although newer cameras need the higher transfer speeds that some of the faster and more expensive memory cards provide, it needs also needs a compatible card reader to be able to transfer images as fast as it is possible between memory card and computer, if transferring shots to a computer isn't to end up take longer than actually taking them in the first place.

Fast cards - 10x, 40x, 60x, 133x, 300x etc. UDMA.

Most memory cards sold these days are able to give high/fast transfer rates, usually written on the card as either 4x, 10x, 40x etc, this referring to the speed increase over a 'standard' card, or increasingly now the actual data transfer rate, 15mb/s, 30mb/s etc. The standard card transfer rate is classed as 150kb/s which translates as 9mb's a minute. Which isn't really very fast when you consider the size images files are these days and is why large capacity cards with fast read/write rates are now increasingly common. So a 40x card can read/write at 6mb/s, a 60x - 9mb/s, 133x - 20mb/s, 200x - 30mb/s, and 300x - 45mb/s. The highest current rate, that of 300x or 45mb/s is only achieved with the latest UDMA cards.

With the newer digital cameras with high megapixel sensors there is a need to ensure that you use the fastest cards available in order to achieve reasonable read/write rates. This is especially true of the professional DSLR's with high frame per second rates. They need to be able to write images to the memory card at very fast rates. This rate is also applicable to the speed with which images can be downloaded from the card to the computer. The latest card standard to arrive is UDMA. This enables the fastest transfer rates to date, but is restricted at present to Compactflash.

To enable fast transfer rates between the memory card and the computer when downloading images the interface used must also be capable of coping with the flow of information. So it must match the card requirements or the rates promised won't materialize. If you only have a USB1.1 card reader then fast rates won't happen whatever the speed of the card. You need at least USB2. The latest spec cards, those UDMA enabled, need a special UDMA reader using the firewire interface to reach the maximum rates they are capable of. Or one of the latest PCMCIA/Expresscard readers used in laptop expansion card slots which offer the UDMA interface.

There are various other points to be aware of and we'll deal with these also.

Compactflash: [CF] - current.



This was one of the first types of memory card made and is still the most popular to date, although it's now being replaced in most digicams and some consumer level DSLR's by the smaller size SD card format. There are two versions, Type 1 and Type 2 . Type 2's were originally introduced to enable higher capacities and are thicker, however even Type 1's are now available in capacities up to 8Gb and beyond. The latest CF standard is CF3, which supports CF1 & CF2 along with PIO 0-4 and UDMA 0-6 standards. This allows the fastest transfer rates of any card type to date.

Originated by SanDisk, CompactFlash cards are now made and sold under many different brand names, are the preferred card choice for many, and standard fitment in many DSLR's, especially semi-pro and pro types. The latest versions now offer very high capacities to suit the high pixel counts of many newer cameras as well as high transfer rates - up to 300x - and 16Gb and 32Gb cards have been announced recently.

Not all cameras can support high capacity cards over 2Gb. Older cameras need a firmware update from the camera maker, if they have released one. So be careful when purchasing an older secondhand camera using CF. Most older cameras have an upper capacity limit of 512mb or less due to firmware limitations, and not all cameras support type 2's either, so beware on these points also.

Smartmedia: [SM] - now obsolete



The second original type of card, these were used in cameras made by Olympus and Fuji. At one time the second most popular type, with a maximum capacity of 128mb, these cards have now been superceded by the smaller xD picture card, which new Olympus and Fuji cameras are now designed to accept. When buying a secondhand digital camera using Smartmedia be careful. The design meant that the camera controlled the maximum capacity of the cards that could be used in them, which in some cases seem very low these days. Often just 32mb or 64mb. These cards weren't brilliant in use, the main problem being the connection design, which caused many issues and led to them being replaced. As far as we are aware they are not available new anymore.

Secure Digital: [SD] - still current



These were a new smaller card format with additional security originally designed for use in multi-media devices such as mobile phones, PDA's and personal players, which camera makers then started using to enable smaller cameras to be produced, and they are rapidly replacing Compactflash in a wide range of digital cameras. They are available in sizes up to 2Gb, their maximum capacity design limit.

Secure Digital High Capacity : [SDHC] - current



These are a new high capacity version of SD designed to overcome the maximum design capacity of 2Gb. Only cameras that are SDHC compatible can use these cards. Recently new high capacity cards up to 8Gb have been announced, with fast transfer rates that approach that which some of the faster CF cards can achieve.

Multimedia: [MM] - still current - but uncommon



These are identical to Secure Digital in most respects, the difference being they don't have the built-in security features of the former, and are thus slightly cheaper and less restrictive in their use. In reality these cards seem to have disappeared from the marketplace given the rise in popularity and availability of SD cards.

Memory Stick: [MS] - still current



Designed by Sony and used exclusively in cameras made by them, Memory stick slots are often to be found in Sony's laptop computers. As with Smartmedia, maximum capacity limitations has led to new variants, Memory Stick Duo and Memory Stick Pro. As with other types, older cameras cannot accept the newer cards. Some Sony cameras, and their DSLR's, use CF cards.

xD picture card: [xD] - still current



The new standard card for many Fuji and Olympus cameras, a replacement for Smartmedia. They are the smallest of all cards currently made. Many Olympus and Fuji cameras use this format alongside CF.

Comments

The type of memory card a camera uses can play vital role in how well, or badly, a camera may perform, and how easy it is to transfer images for long term storage. All the different types of cards have their good and bad points, but there are some that have stood the test of time better than others. As a general rule the two most common card formats are CF and SD/SDHC. If you see cheap/bargain price digital cameras for sale be aware this might be because they use a less common or obsolete card format for which it is more expensive, difficult, or impossible to obtain cards.

One point that should be made is that although it is not terribly common these days, memory cards can and do corrupt and fail, and it is for this reason that many digital camera users prefer to use a number of smaller capacity cards on which to store the images they are taking, rather than one large one. Some even swap the cards about as they shoot, so that should a card fail, not all images, nor all those from one particular scene or event, are lost. To lose some images would be bad enough, to lose all would be, for a professional, a disaster.

To prevent the chance of a card corrupting, care should be taken when inserting one, and you should never try removing one whilst the camera is writing to it. Not only will the images being written be lost, but it will almost certainly corrupt the card as well, rendering it unusable. It may well also damage the camera's electronics. Indeed it is best to make sure the camera is turned off before inserting and removing memory cards.

Although all cards of any particular type are made to set standards, cards from different sources have sometimes been found not to work with particular camera makes or models. It is therefore recommended that you take care when buying new memory cards for a camera, and if you can, take the camera along and make sure that the cards will work in it. If you can't, perhaps because you are buying by mail order/on-line, then stick to well known makes. These include Sandisk, Fuji, Lexar, Delkin, Viking, and Kingston.

<http://www.digicaminfo.btinternet.co.uk/memorycards.htm>

STORAGE CAPACITY TABLE

http://www.picstop.co.uk/pdf/image_count.htm

Storage Capacity									
Megapixel	64MB	128MB	256MB	512MB	1GB	2GB	4GB	20GB	40GB
2MP	74	148	296	592	1184	2368	4736	9472	18944
3MP	54	108	216	432	864	1728	3456	6912	13824
4MP	33	66	132	264	528	1056	2112	4224	8448
5MP	25	50	100	200	400	800	1600	3200	6400
6MP	21	42	84	168	336	672	1344	2688	5376
7MP	19	38	76	152	304	608	1216	2432	4864
8MP	16	32	64	128	256	512	1024	2048	4096
Card Speed	Data Transfer Rate								
8x	1.2 MB/sec								
12x	1.8 MB/sec								
20x	3.0 MB/sec								
25x	3.8 MB/sec								
30x	4.5 MB/sec								
40x	6.0 MB/sec								
60x	9.0 MB/sec								
66x	10.0 MB/sec								
80x	12.0 MB/sec								
100x	15.0 MB/sec								
120x	18.0 MB/sec								
1X Speed is equal to 150 kilobytes (KB) per second									

Camera Settings Explained

http://www.photography101.org/basics/camera_settings_explained.html

Whether you have a point and shoot camera or a digital SLR, you may find that you have many of the same settings. Understanding these settings and how they work is one of the fundamentals of photography. Without this knowledge, you will never be able to take your shots to the next level that custom settings offer. One of the most critical mistakes beginner photographers make is using the 'Auto' modes on their cameras. While this is fine for simple snapshots, actual photography requires much more.

Camera Modes

There are several different 'modes' on your camera that determine the level of automation which your camera will provide. These modes are generally adjusted by a dial located on top of your camera, and may range from fully manual, meaning you have control over every single aspect of the shot, to fully automatic, meaning the camera will control everything for you based on the current conditions.

There are two categories (or 'zones') of modes, Basic (automatic) and Creative (manual), each of these zones make up half of the dial. Most dials have 'Fully Automatic' mode in the very center of the dial, marked by a green square. **Basic** modes are marked by icons which represent the primary use of that particular mode, and are generally accessed by turning the dial clockwise from fully automatic mode. **Creative** modes are marked simply by letters, and are generally accessed by turning the dial counter-clockwise from fully automatic mode.



Mode dial on the Rebel XT.

Above the fully automatic mode is the creative zone, below it is the basic zone

BASIC ZONE (AUTO MODES)

Portrait Mode - Icon: A side (profile) view of a head. - This mode brings subjects in the foreground into sharp focus, and may enlist the use of a larger aperture to blur the background.

Landscape Mode - Icon: Mountains. - This mode is for taking shots of distant objects, or wide-angle shots, and will bring background objects more clearly into focus by setting a smaller aperture.

Night Scene Mode - Icon: Icon containing a star. - This mode uses flash and a slower shutter speed to illuminate the subject and allow more light to enter the camera.

Macro Mode - Icon: Flower. - Used for extreme close-up shots where the camera may have trouble focusing in other modes.

Sports / Action Mode - Icon: Running person. - Use this mode for shots in which there is a good amount of motion which you want to capture without blurring.

CREATIVE ZONE (MANUAL MODES)

Modes which are located in the manual zone, and offer greater control and fine-tuning of your shots.

Program Mode (P) - Much like an automatic mode, the camera will still do the majority of work for you, but offers you the option to manually override settings such as focus, while the camera manages the exposure. Program mode is decent for beginners who want to be able to get quick shots without putting too much thought into it, but still want a bit more versatility than an auto mode offers.

Shutter Priority (TV) - In shutter priority mode, you are able to manually adjust the shutter speed while the camera controls the aperture and ISO.

Aperture Priority (AV) - Aperture priority mode is similar to shutter priority mode, but lets you adjust the aperture, while the camera controls shutter speed and ISO.

Manual Mode (M) - This mode provides the most control of all, as you are able to adjust every aspect of the shot. There is absolutely no camera assist in this mode. You are able to adjust aperture, shutter speed, and ISO for yourself. Most experienced photographers will exclusively use manual mode due to the level of customization it offers.

Auto Depth of Field Mode (A-DEP) - A-DEP is a mode exclusive to Canon cameras, and will measure the depth of the nearest and furthest objects in the viewfinder when the shutter release is pressed half-way, and therefore is able to compose a shot with no blurring of the foreground or background objects which you focus on. A-DEP is complicated to use and generally not worth even attempting.