

DIGITAL PHOTOGRAPHY for beginners



Denis Pemberton

DIGITAL PHOTOGRAPHY

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Jargon Buster

Course Requirements

Digital Camera.
Pen stick
A4 Folder
Note Pad
Photo editing software

Suggested Reading

Lee Frost (2009) 50 Photo Projects, ISBN 978-0-7153-2977-1

What is a Digital Camera?

Digital cameras are not that different from conventional film cameras. The principle components are much the same, there's a light box with an aperture, a lens, a shutter and a light reactive component, the new component that's been added into the mix is a tiny computer, which controls the whole shooting match. While its true that the more you pay the more gadgets you get, besides the computer, the basic elements that make up any camera are identical from the most cutting edge back to Kodak's iconic Box Brownies and before. Remember the best photographers can produce exceptional images armed with nothing but a compact camera, the strength of their imagination and a solid understanding of the principles of photographic practice. Ultimately even the most automated and expensive camera cant make up for a lack of understanding.

Where the digital camera does differ is in the way it records the light. Conventional cameras relied on various formats of film such as 120mm, 35mm that would be sealed in a roll or canister. The chemicals made up these films would then react to a burst of light rushing in when you take your image, and it wasn't until they were correctly processed in a darkroom that the images could be viewed. In a digital camera the film has been replaced by a complex electronic sensor that measures and records the light in order to reproduce the original scene, the images are then stored onto the memory cards which like film have different formats such as Compact Flash, SD and xD.

As a result of this move away from chemical reactions the digital camera has a fundamental advantage over film. Using the same sensor, a digital camera can take thousands of images without wearing out, images which you can review immediately and decide whether or not to keep them.



Compact



Prosumer



DSLR

Memory Cards

There are many types of memory card available, each camera manufacturer having its preferred type, in compact cameras most use the smaller cards such as the xD or RS-MMC where as the larger DSLR cameras will use the Compact flash and Sd cards.



Before you take your photos you need to prepare your tools, you will need to format your card to get it ready to record images and removes any unwanted images, and ensures the card allows us to use its total storage capacity. You may find yourself just using the Delete to remove unwanted images. However using this when actually emptying the whole card actually lowers the total available space and as a result how many photos you can take.

Format your Memory Card

1. Turn off the camera.
2. Open the memory compartment and insert the memory card, make sure you insert it the correct way round. If you are in any doubt most cameras have a small picture of the appropriate way round beside the slot.
3. Make sure the memory compartment is closed before switching on the camera.
4. Put the camera into its setup mode, this can be achieved by either pressing the menu button, rotating the dial to the tools symbol or navigating to the cameras setup option via the menu.
5. Locate the format option and select it, this is usually done by pressing an OK button or pushing the cameras four-way button to the right to access a submenu.
6. At this stage the camera will require confirmation asking the question 'Are you sure you want to format?' All cameras default to NO and you will need to select Yes to proceed.
7. Confirm that you want to format by pressing OK.
8. The camera will ask you to wait. This may take seconds or several minutes depending on the size of the card.
9. Exit the menu or setup mode, your ready to take you photos.



The Shutter Release

Just about every camera uses the two-stage shutter release. Unfortunately many beginners never get told how to use the shutter release correctly and as a result they stab at the button and fume as the camera pauses momentarily, before seemingly remembering what it was doing and finally taking a photo. This pause is often mistakenly referred to as shutter lag, when in fact it is simply the time the camera takes to focus on the subject.

Practise with your shutter release

1. Turn on the camera.
2. Grip the camera comfortably in your hands with your index finger resting over the shutter release.
3. Choose your subject and compose your image.
4. Softly press the shutter release until you feel a small amount of resistance, when you do don't let go, instead try to keep the button held at this point.
5. The camera will then focus and the image will snap into clarity.
6. Once the camera is focused there will be an audible beep, a small green light on the camera or on an indication on screen that you are now ready to take your photo.
7. Gently squeeze the shutter release and the camera will take the photo. Gently lift your finger from the shutter release.

Auto Focus

Aiming your camera at something squarely in the centre of the display such as a person standing in front of a landmark provides a very simple target for your camera to automatically focus on. However, place two people in the foreground and it's all too easy for things to go horribly wrong. There is a simple process to help its called focus and recompose.

1. Hold the camera and rest your index finger on the shutter release.
2. Select one of your subjects and position the target in the centre of the screen or viewfinder.
3. Softly press the shutter release until you feel a small amount of resistance. When you do, continue holding with the same amount of pressure.
4. The camera will then focus and the chosen subject will sharpen up. Once the camera is focused there will either be a beep or an indicator light on the camera screen. Keep the button held at the same point.
5. Now adjust the position of the camera to place the centre of the display between the two subjects ensuring you do not press too hard and take a picture or let go of the shutter release.
6. Once you have both subjects in the frame, squeeze the shutter release and the camera will take the photo.

7. If you simply place your focus point in the centre of the image, there is a good chance your camera will focus well behind your subjects.

Zoom, Optical & Digital

One of the most frequently asked questions is ‘what’s the difference between Optical and Digital zoom?’ The short answer is use the optical zoom and forget about the digital zoom. Cameras with an optical zoom have several elements in the lens which can move back and forth to magnify the image projected to the camera’s sensor. This does not affect the image quality and can make it possible to get much closer to the subject. When a digital zoom is used, rather than altering the way the light hits the sensor, the camera simply takes the centre portion and enlarges it or conversely crops it to use a smaller portion which gives the impression the subject is brought closer.

For example setting the camera to 8 megapixels and zooming in 1.8x will only record a 5 megapixel photo, zooming to 4.8x and you are left with 1 megapixel.

1. Grip the camera comfortably with your index finger over the shutter release.
2. Find a distant subject and position the target in the centre of the screen or viewfinder.
3. Begin zooming into your subject, on most cameras this will be achieved by either pressing the T button or pulling a rocker switch toward either the letter T or an icon for a single tree.
4. While the camera is zooming in you will notice that a bar appears on the camera display showing how far through the zoom you are. In some cases the bar will have a line intersecting it, denoting where the optical zoom ends and the digital zoom begins.
5. Experiment by continuing to zoom past the intersecting line, notice the effect on the quality of the image on screen.
6. Once you are happy with the difference between both technologies, press the W button or pull the rocker switch in the opposite direction towards the W or group of trees.
7. Try zooming in and out until your original subject is as large as possible while still only using the optical zoom.
8. Now softly press on the shutter release until you feel a small amount of resistance, when you do, continue to keep holding with the same amount of pressure.
9. Once the camera is focused, squeeze the shutter release and the camera will take a photo. Remember to wait until the photo has been taken before lifting your finger.

Flash

It's easy to rely on your camera's built in flash but there will be occasions when even the smartest digital camera can be fooled and you will need to know how to overrule it in order to get the photo you are after.

1. Turn on the camera and wait for the flash to charge.
2. Press the directional pad or button labelled with a crooked arrow or lightning rod, this will access the flash mode.
3. Most cameras use icons to represent the different flash modes. For the first photo select the lightning rod with the word Auto or the letter A, next to it.
4. Now take the photo, depending on the available light, the camera will decide whether or not to fire the flash.
5. On the camera press the directional pad or button labelled with the lightning rod to access the flash mode selection again. This time select the lightning rod on its own. This mode overrides the camera deciding when to use the flash and sets it off for every photo.
6. The last flash mode is the one with the eye next to it, this is the Red Eye mode. This mode fires not one, but a series of quick flashes, the effect of which is that the eyes or rather the iris of the person you are photographing contract. By making the pupils smaller you avoid the demonic red eye look.



When taking photos of people standing in front of a bright light source your camera will try to adjust for the additional light, leaving you with a silhouette rather than a portrait shot you were after. This can be easily remedied by forcing the flash to fire, effectively filling in the darker areas. This technique is known as fill-in flash.

Camera to Computer

While there are numerous ways to transfer images from your camera to your computer there are two principal methods.

Option One

1. First install the software that comes with the camera, this will provide an interface between the computer and the camera.
2. You will need a USB cable normally supplied with your camera. This should be connected between the camera and the computer.
3. Whilst transferring between the camera and the computer it is wise to have the camera fully charged or plugged into a power supply.
4. Next set the camera to playback mode by selecting the green triangle or the computer symbol.
5. If you have correctly installed the software the computer should automatically react to the camera and will either automatically retrieve the images or it will prompt you on what course of action to take.
6. Once you have verified the images are safely on the computer you can delete them for the memory card.

Option Two

1. If you have a Card Reader plug it into an available USB slot, preferably a USB 2.0 high-speed socket. On a Windows based system this will add a series of new drive letters under the computer icon.
2. Make sure the camera is switched OFF, remove the memory card from your camera, this can be located in the battery compartment or will have its own cover elsewhere. Press the eject button or the card to eject it.
3. Insert the memory card into the corresponding slot on the card reader. Ensure you do this the correct way. Remember, there should be no need to force the memory card into the slot.
4. The card reader should react and request that you start transferring the images into a folder of your choosing.
5. If it fails to react, one of the new drive letters will change it's name, taking the name of your memory card or camera. To check this double click on Computer.
6. TO transfer the images across, double click on the new drive letter, this should open up to reveal a new folder called DCIM.
7. Open this folder and there should be either one or several sub-folders, these will bear the cameras name.

8. By double clicking on each of these folders you will be able to access your images. All that remains now is to copy them to your computer.

Scene Modes

While it's perfectly possible to get good holiday snaps and passable party pictures by relying on your camera's automatic modes, capturing truly memorable photos needs a little more investment from the photographer.

Scene modes are preset configurations designed to make your life easier, taking the grey matter out of getting a perfect exposure.

Portrait Mode

1. If your camera has a dial to select modes, turn the dial to the picture of a bust or a silhouette of a head. If you can't find the icon or don't have a dial you may need to select or press Scene occasionally this is represented as SCN.
2. Once in scene mode the camera will appear to function as normal, save for a small icon in one corner showing the current scene mode.
3. For those cameras without a dial you must now press Menu to access the available modes. Once again look for the symbol representing a head. Ensure the Portrait mode is highlighted and press OK.
4. Now you are ready to compose your portrait, start by moving the focus point over your subject and half pressing the shutter release. Then with the button still half depressed move the camera to get the composition you prefer.
5. Once you are satisfied with the image, and your sitter has a suitable expression then gently squeeze the shutter release to take your picture.

With the camera in Portrait mode it will set the aperture to a wide setting and a fast shutter speed, this will isolate your subject from the background by producing a narrow depth of field.

Landscape Mode

1. Turn on the camera and if it has a dial, select the Landscape mode this will be represented by a miniature mountain range.
2. Once in scene mode the camera will appear to function as normal, save for a small icon in one corner showing the current scene mode.
3. For those cameras without a dial you must now press Menu to access the available modes. Once again look for the symbol representing a head. Ensure the Portrait mode is highlighted and press OK.
4. With everything correctly configured you are ready to take your photo, half press the shutter release to allow the camera to focus and with the button held, make small adjustments to the camera's position until you are happy with the composition.

5. Once the camera is focused, gently squeeze the shutter release to capture your photo.

With the camera in Landscape mode it will set the aperture to a narrow setting and a slow shutter speed, this will give a large depth of field, it is advisable to use a tripod or some sort of support when shooting landscapes.

Night Mode

1. At some time we've all looked out over the ocean or cityscape at night and felt compelled to take a picture, but prints often fall very far short of the original. Your digital camera has the solution and this section will teach you how to capitalize on its night mode.
2. Ideally when taking photos at night you should use a tripod as the longer exposure times mean there is quite likely to be camera shake, which will soften or blur the final image.
3. If you are using a tripod, locate the tripod's screw thread into the matching screw mount on the bottom of the camera. This is a standard size on digital cameras and should always fit. Screw the camera in place.
4. Turn the camera on and if it has a dial, select the night mode. This will be represented by a crescent moon or a white on black figure perhaps accompanied by a star. If you can't find the icon or don't have a dial, select or press Scene or SCN.
5. For cameras without a dial, press Menu to access the available modes. Highlight the night mode symbol and press OK.
6. Select your desired flash mode. For portraits the flash with red eye reduction is preferable and for landscape images generally the flash should be disabled. However, feel free to experiment.
7. Whether you are using a tripod or not it's worth using the self-timer as this eliminates the possibility of any camera shake introduced when you press the shutter release.
8. Push the four-way controller towards the stopwatch symbol. This should bring up a menu on the camera display allowing you to toggle the timer on and off. Some cameras even have timer variables such as 2 or 10 seconds.
9. With everything correctly configured you are ready to take your photo, half-press the shutter release to allow the camera to focus and with the button held, make small adjustments to the camera's position until you are happy with the composition.
10. Once the camera is focused, gently squeeze the shutter release. This will start the timer's countdown and once completed, capture your photo.

With the camera in Night mode it will set the aperture to a narrow setting and a very slow shutter speed, this will give a large depth of field, it is advisable to use a tripod when shooting Night Scenes.

Aperture Priority

Just like the iris of your eye, your camera's aperture controls how much light is allowed to fall on to its sensor but just as important, it also controls how much of the image is in focus. In this section we will try changing the aperture value and gain an understanding of how that affects exposure and the images can create. The standard measurement of apertures is shown in F stops, which typically range through 2, 2.8, 4, 5.6, 8, 11, 16 and 22. As if to confuse matters the higher value, the smaller the aperture. By altering the size of the aperture it's possible to increase or decrease the amount of the image that is in focus. This is known as the depth of field and allows for great deal of creative control.

1. Not all compact cameras provide the option to control the manual settings. If your camera has a dial to select modes, turn the dial to the letter A. If you can't find it or don't have a dial you may need to select or press M.
2. For those cameras without a dial you must now press Menu to access the available modes. Once again look for the letter A or M. Once this is highlighted press OK.
3. Selecting A or M will put you into the manual-shooting mode.
4. In the previous scene modes, the camera was configured to achieve the best results depending on the type of shot selected, here we have the choice to alter the camera's aperture values and rely on its built-in metering to adjust the shutter speed to our choices.
5. On the LCD screen there will be an F with a series of numbers next to it. Typically by pushing up or down on the four-way control or rotating a wheel, it is possible to alter this number.
6. To produce similar effects to that of portrait mode, keep pressing the number until it is as low as it will go. For example F3.5 or F2.8.
7. If you are shooting indoors remember to turn on the auto flash with red eye reduction.
8. Now that you are ready to compose your portrait, move the focus point over your subject and half press the shutter release. Then with the button still half depressed move the camera to get the composition you prefer.
9. When you're ready squeeze the shutter release to take your photo.
10. Try repeating this task with different aperture values. You will notice that this has an impact on how much of the image is in focus. Using higher numbers can produce the same effect as a landscape photo, with much of the image sharp.

Shutter Priority

There can't be anyone who has used a camera and not had a blurred photo or two back from the photo labs at some point, whether the whole image was blurred or simply one moving element. If you didn't intend it, the effect normally ruins the snapshot. By learning what to expect from differing shutter speeds and more specifically, how to control the speed chosen by your camera, you can either ensure you don't get any more bothersome blur or take the bull by the horns and deliberately add it to try some new creative exposures. As with many aspects of photography there are no real rules but we will look at some guidelines that should improve your images.

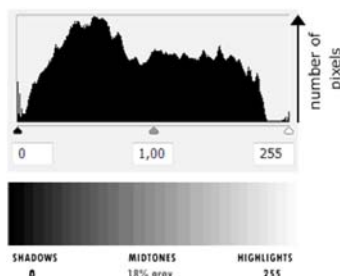
1. First, we need to select shutter priority. Turn the mode dial to S for shutter priority, if you have a Canon camera this will be under Tv for time value. If you can't find S or don't have a dial you may need to select or press S.
2. For those cameras without a dial you must now press Menu to access the available modes. Once again look for the letter S or M. Once this is highlighted, press OK. Selecting S or M will put you into the manual-shooting mode.
3. In our first experiment with shutter priority we will try and freeze some movement as sharply as possible.
4. Next to the F number from the previous task you will see another number, which looks like a fraction, for example 1/25. As with the aperture value, this can be changed by pushing up or down on the four-way control, or in some cases by turning a selector wheel.
5. To freeze a moving subject you should adjust this number until it reaches 1/250, this means the shutter will be open for only a 250th of a second. If the F number next to this changes to red it is an indication that there isn't enough light for this speed.
6. Now you are ready to compose your photo, quickly move the focus point over your subject and half press the shutter release. Once it confirms focus squeeze the shutter release to take your photo.
7. Repeat this task with different shutter speeds and you'll notice the subject begins to develop a motion blur. Try using slower shutter speeds in conjunction with a flash – this can create some interesting effects.

Manual Mode

Switching your camera to M seems a long way from the safety of automatic, but mastering the manual mode can be a great deal of fun and allows you to really get hands-on, to try out new ideas and experiment with different exposure settings. However, while it is true that manual mode literally hands back control of your exposures to you, the drawback is it also gives you the freedom to really screw up. Take heart though, after all, getting it all wrong and trying again is pretty much one of the main benefits of digital, just don't go wading into attempting to photograph a wedding using manual - even many of the professionals don't try that.

1. First turn the dial to M to select Manual. This mode combines adjustments of the shutter and aperture to give you complete control over your exposure including the ability to choose your own white balance.
2. For those cameras without a dial, you must now press Menu to access the available modes. Look for the letter M or Manual. Once this is highlighted, press OK to activate manual shooting mode.
3. Try photographing items in and around your home as this will familiarize you with the camera's metering system and just how much light is required to get a good photo.
4. In our previous tasks we tried altering the aperture and shutter independently, in this task the same controls can be used to adjust both values together. However take note, where previously the two values automatically adjusted to compensate for your choice of shutter speed or aperture value, now it's up to you to adjust the other value and balance the equation. For example, if you change from F5.6 to F8 that will let in half as much light and so require twice the exposure time, specifically a change from 1/60 to 1/30.
5. To capture a successful photo you must set up your desired composition then tap the shutter release to take a meter reading. This will provide you with a measurement of how much light is required.
6. Next adjust both the aperture and shutter speed to the correct values to create a well exposed photo. You are now ready to capture your photo, quickly move the focus, point over your subject and half press the shutter release.
7. Once it confirms focus, gently squeeze the shutter release to take your photo.

Digital cameras have an additional trick up their sleeves to check the available light, known as the histogram. Histograms provide an accurate breakdown of the light and dark pixels in your picture. Along the horizontal line the histogram represents every available tone from jet black valued at 0 to brilliant white valued at 255. The positions of the peaks indicate how light or dark the image is. Their heights show you how many pixels have this particular shade or colour. While there isn't a right or wrong way for the histogram to look, for most snap shots you should aim to have the peaks toward the centre of the image, thereby avoiding under or over-exposure.



The Histogram

By now you should be sensing a theme - the histogram is your friend, in fact it's more than a friend, it's pretty much vital. The reason behind this is that your camera or more specifically its display, has a nasty habit of lying to you, it's nothing personal but big bright displays sell cameras, accuracy isn't much of a selling point, yet. Camera displays are generally accurate representations of the outcome of the photo. This is where the histogram becomes such a key tool. If you learn to make use of the histogram and disregard the appearance of the image for all but the framing you will find the amount of time you spend having to brighten and generally tweak your images will be cut by half. This task will cover the use of both playback and live histograms.

Live Histogram

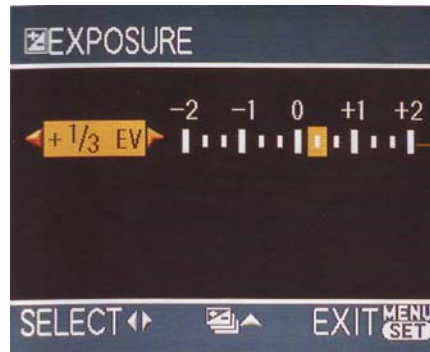
1. We will first look at live histograms. Assuming it has one, activate your camera's live histogram by repeatedly pressing the display button until the moving mountain range pops onto the screen. On the current crop of digital compacts, the histogram will typically be a combined RGB one. This means all the colour information is shown in one wave. Some high-end cameras however, go a stage further and show each colour separately.



2. You will notice as you move the camera, the mountain range undulates, swaying from left to right as the view gets darker and lighter respectively.
3. Typically the histogram is split into five segments representing from left to right, very dark (shadow detail), dark, mid (18% grey), light, and finally highlights.
4. Before taking your photo check the peaks. If the histogram shows the curve peaking in the segment to the far left it's likely to be underexposed, conversely if there's a peak in the far right it's probably rather overexposed. To be fair, with these extremes the image would probably have tipped you off to this already.
5. Try framing up a couple of standard shots, perhaps a portrait or landscape, and keep your eye on the histogram - the top of the main peak will settle between the third and fourth segment. Take a few test shots and play them back on the camera's display, again they will appear well exposed.



- Transfer these photos to your computer and ask yourself, are you still happy with the results or could they do with being just a little brighter? It's a fair guess you would be happier with them a bit brighter.
- Repeat the same shots, but this time as well as using the live histogram use the camera's exposure compensation feature. Keeping your eye on the histogram's movement adjust the amount of additional exposure until the main peak of the histogram hovers somewhere between the fourth and fifth segment. Remember that the slope shouldn't bunch up at the right edge as this means you are losing the highlights.



- These images may initially appear overexposed on the camera's built-in display. Nevertheless, persevere and compare them to the previous batch on your computer - which do you prefer? In most instances, digital cameras intentionally underexpose their photo by around -0.3 EV. This reduces the chance of overexposure but by tweaking this value your colours can become punchier.

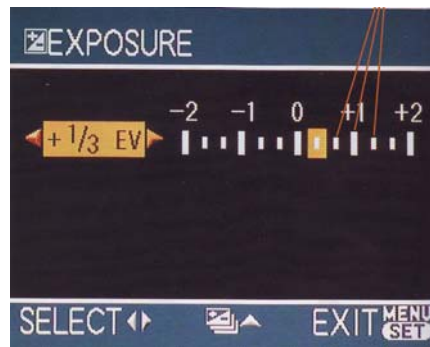
Playback Histogram

- Without a live histogram you can still make good use of the information provided. However, you will find the process requires a little more patience and experimentation.
- Compose some typical shots to familiarize yourself with the camera's metering, for example, a group, portrait or landscape and then take a couple of shots.



- Once you have your test images, switch the camera into Playback mode and press the display button until the histogram information is revealed. If the histogram shows the curve peaking in the segment to the far left it's likely to be under-exposed, conversely if there's a peak in the far right it's probably rather over-exposed.

- Depending on the location of the main peak, try altering the exposure compensation one step at a time to move the peak into the fourth segment. There is no such thing as a perfect histogram so this obviously won't work for every shot but getting used to the way your camera reacts will stand you in good stead when it comes to tweaking it for the best results.



ISO

If you've ever bought a roll of 35mm film the letters ISO maybe familiar to you. ISO stands for International Standards Organization and, in relation to film photography, it's used to represent the film's reactivity to light. The higher the ISO number of a film, the faster it absorbs the image. The trade-off however is that this faster film normally appears grainier and typically record less fine detail.

Move on to digital cameras and obviously the film is no longer part of the equation, however digital cameras still have ISO numbers allowing us to understand how they will perform in different lighting. Digital cameras can mimic the reactivity of faster film by amplifying the signal received by the light-sensitive sensor. However, just like amplifiers on a stereo, this can introduce noise. With a stereo this has the effect of distorting the sound or adding hissing but in digital photography this adds a visible fizz to the image, made up of unwanted coloured dots. We will experiment with the speeds and learn what our camera is capable of.

1. The first task is to find the camera's ISO control, which differs for almost every camera. However typically it is either clearly labelled as ISO on the camera's body or accessible via the Menu command. In some cases the ISO control will be labelled as Sensitivity.
2. Depending on the configuration of your camera either rotate the mode dial or press the appropriate button to open the ISO menu.
3. You will now be presented with the list of available ISO settings as well as an automatic setting. As tempting as it may be to leave the camera on the Auto setting, typically it doesn't offer the complete range of the camera's capabilities. Indeed knowing how to switch ISO modes can allow you much more creative flexibility.
4. Now that we have found the ISO menu the first task is to select the highest value, this will normally be either, 400, 800 or 1600. While there are other values available these are amongst the most common options. After choosing the highest available value, confirm the choice by pressing OK or, in the case of Olympus cameras, pushing the navigation pad to the right.
5. The camera is now at its most sensitive, making it easier to shoot photos indoors without blurring. The downside to this mode is that the images are going to have a grainier or noisier quality to them. This will be hard to see on the small camera display, but it's there.
6. After experimenting with the higher sensitivity we will set the camera to its midway point. Open the ISO menu back up again and this time select the ISO 200 speed. While this won't necessarily be the middle speed available it should provide a reasonable average.
7. Once set at 200, your camera will behave as normal, giving well-exposed images in typical daylight scenes and good indoor photos when assisted by the built-in flash. More important, your photos should exhibit almost no noise or grain giving them a smooth detailed quality. What we need to play with next is the camera's lowest speed – this mode can be suitable for creating longer exposures.
8. Open the ISO menu again and select the lowest value available, 50, 64 or 100 are typically the lowest speeds found on standard compact cameras. As the least-reactive speeds available they may leave you scratching your head as to their practical application. However should you want to use a long exposure or large aperture you may find the higher ISO values simply can't cope.
10. Try taking some images at night with the lower ISO setting and compare the results with higher values. The contrast in image noise should underline the value of this last group of ISO values.

Metering

Now that we have learnt how to exert more control over the way our images are constructed, it's time to take a more detailed look at the way our cameras actually see things. If you'll forgive the tired analogy, the camera works much like the human eye. The iris of an eye can expand or contract depending on the amount of light available and, just as important, what bit of the world around you your brain chooses to focus on. Cameras don't have the benefit of your brain to control the way they pick out details, what they do have is advanced ways of gauging or metering the light. Most cameras depend on a matrix of sensors to measure an exposure which balances as much of the image as possible, this is known as matrix or evaluative metering. Some cameras offer alternatives which allow for more creativity, such as centre-weighted or even Spot metering. These concentrate on the middle portion or a tiny circle in the centre of the scene respectively. In this task we will look at the effect of using differing metering modes.

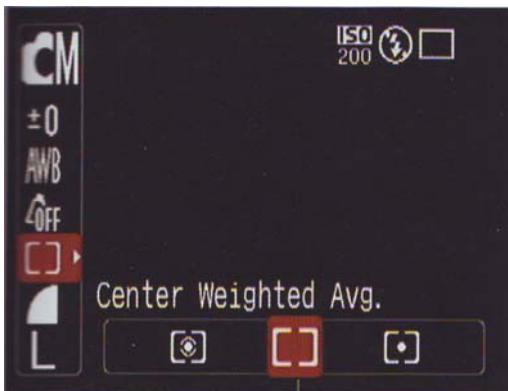
1. For this task put the camera into auto mode and choose a subject that is either much darker or brighter than the surrounding area – for example taking a portrait with the window behind your subject or a hallway looking out to a bright exterior.
2. This highly contrasting scene will present a challenge for the camera's average-based metering, so try taking a couple of test shots focusing on the chosen subject. The camera will concentrate on correctly exposing the vast majority of the image, which will result in massively under or over-exposing the subject itself.
3. This is where a bad workman would be blaming, if not bludgeoning, his tools! However, we know better and now we will select the centre-weighted metering mode. First, if available, rotate the mode dial to put the camera into Program AE or P mode.
4. Next, press the Menu button, which should give you access to the shooting menu. Depending on the camera system you will either find the metering mode clearly labelled or you should look for a box with a dot in it enclosed by brackets above and below.
5. Press the metering icon or Menu, this will give you access to the array of metering modes. These will either be presented as a list, or you may have to press the same button repeatedly to toggle between the numerous options. For centre-weighted on a Nikon you should look for the same square box with a dot in it and brackets above and below, on a Canon the box should be empty.
6. Once you have identified and selected the correct mode press OK to return to the shooting mode. Try taking some more shots of the same subject - you may be able to notice a slight shift towards correct exposure of the subject rather than the background. This is because the metering information for everything outside the centre portion is discarded, allowing you to be more selective.
7. Finally there is a spot metering mode. Not all cameras have this option but if you return to the metering mode it is represented by a square with just a dot in the centre. This mode typically only uses metering information from around 3.5% to 5% of the centre of the scene. This mode will correctly expose just the tiny bit in the centre of the image, making it ideal for shooting subjects in a shaft of light or strongly backlit without resorting to a flash.
8. Try shooting the same scene in each of these modes and experiment with the spot metering mode. It's possible to create radically different exposures with just a slight shift in the position of the camera.



(1).



(4).



(5).



(7).



(8).

Auto-bracketing

Judging the correct exposure in situations with both very bright and very dark elements can be extremely challenging, and if this isn't somewhere your likely to return to this is where auto bracketing comes in. Bracketing takes a series of shots usually between three and five with exposures slightly above and below the suggested metered setting.

Exposure Compensation

In a perfect world, the advances in digital cameras would ensure we got a correct exposure every time. However while true modern cameras do take a lot of the guesswork out of photography there are still many occasions where you'll have to take over to guarantee you get the image you want. This is where exposure compensation comes into play. It can help prevent your clever camera ruining your photos. Most modern cameras allow you to adjust the exposure in steps of either a half or a third of an EV or exposure value - this allows you to darken or lighten the way the camera captures the image. Anyone familiar with Photoshop Elements or a similar photo editing package will no doubt be thinking how it is possible to adjust the brightness and contrast later. Although this is true it's good practice to make any adjustments while you are taking the photo as this produces the best image quality and editing later can introduce unwanted noise to the image. For this task we will look at two common situations in which exposure compensation is extremely useful.

Shooting a wedding dress

Weddings can be fraught with stress at the best of times but when you have the added pressure of being selected as the official photographer you need to ensure you get it right. Remember there's no law against practising. If you have access to a wedding dress or can at least rent one it gives you a fantastic opportunity to familiarize yourself with the inherent problems of photographing a brilliant white dress on a bright day. It might seem like cheating but if you want to set out as a wedding photographer you should know that many budding photographers rely on friends or family to build up their initial portfolio. This task will give you some handy hints to improving your wedding photos.

1. Once you have your suitably attired model, set up your ideal image and take a sample photograph. This image will briefly play back on the camera's display, however, we are going to need to see it for a little longer.
2. Switch the camera to playback by rotating the mode dial or pressing the playback button then find the sample image. The image is likely to look perfect on the camera's small display. However it's extremely deceptive and you should never trust your camera's display for anything more than checking the composition.
3. If your camera features a histogram this is where it becomes extremely useful. You can access the histogram by repeatedly pressing the display button until it toggles through the various display modes before finding the histogram reading.
4. Typically the histogram is split into five segments representing from left to right, very dark (shadow detail), dark, mid (18% grey), light, and finally highlights. While there is no such thing as a bad histogram reading it's perfectly plausible to read the curve and re-shoot accordingly.
5. Closely examine the reading - when shooting a wedding dress there should be a peak in the fifth portion of the reading. However if the histogram shows the curve peaking in the fourth section perhaps the image could use additional exposure, whereas if it's way out to the far right it's likely to be overexposed.
6. Switch the camera back into capture mode and look for the exposure compensation symbol, this may be on the camera's exterior or within its menu. You can recognize the symbol as a diagonally crossed square with a plus and minus symbol on either side of the line.
7. Select the exposure compensation symbol. A horizontal line will appear next to it along with a number. This number will start at 0.0 and can be adjusted by either rotating the camera's control

dial or pressing up or down on the four-way navigation pad. Typically the value will go up or down in 0.5 or 0.3 jumps, negative values will darken the exposure and positive values can be used to brighten it up.

8. Depending on the results of the test shot's histogram, increase or reduce the exposure value by a third of a stop (0.3), retake the photo and check the histogram again. If you reduced the value, the peaks move slightly to the left, pulling the curve away from the extreme right and curing the over-exposure. If you increased the exposure the peak should have travelled to the right and into the fifth portion of the histogram.
9. Try experimenting with exposure compensation – it indicates how your camera is likely to perform in differing situations.

It's a common complaint that photos taken at the beach or the slopes often come back looking murky and lifeless. This is because the metering system in every camera tries to produce an averaged version of what it sees, ideally trying to create an 18% grey version of the world around it. In most situations this technique achieves a good even exposure. However when the environment really has dazzling sands or crisp, brilliantly white snow your camera gets confused and tries to correct for what it thinks is overexposure. The following will help you correct for this effect.

1. Step one is to take a well deserved holiday, once abroad we can tend to the task of photographing beaches or snow. Whether you go on a winter break or worship the sun, the same thought process can be applied. Try taking some sample shots. Don't worry if they disappear before you get a chance to closely examine them.
2. Switch the camera to playback by rotating the mode dial or pressing the Playback button to find the sample image. The image is likely to look perfect on the camera's small display, but don't trust this, just check the composition.
3. As with the previous task we are going to access the camera's histogram, which you can do by repeatedly pressing the Display button until it toggles into the histogram display mode.
4. The test images are likely to show a series of varying sized peaks but look specifically for a tall peak rising in the fourth segment of the histogram. This represents the sand or snow. Ideally this peak should be moved into the fifth segment so that the photo looks correctly exposed.
5. Switch the camera back into capture mode and look for the exposure compensation symbol; this may be on the camera's exterior or within its menu. You can recognize the symbol as a diagonally crossed square with a plus and minus symbol on either side of the line.
6. Once you select the exposure compensation symbol a horizontal line will appear next to it along with a number. This number will start at 0.0. Try increasing the exposure value by a third of a stop (0.3), retake the photo and check the histogram reading again for this new photo. You should notice the peaks move slightly to the right - this will have the effect of brightening up the image and making the colours more pleasing.

Flash Compensation

Now that we understand about exposure compensation it's time to look at flash compensation. Predictably the two features have a lot in common, and both allow you to adjust the way you record your photo at the time of capture. Obviously flash compensation only comes into play when using the camera's flash - by using the compensation adjustment it's possible to increase or decrease the power of the flash. For example, if you take close portraits in a poorly-lit room some compact cameras can't judge the exposure correctly and will leave your subjects looking as though they've had their features blasted into a brilliant oblivion by the overpowered flash. This task will teach you how to adjust the power of your flash, enabling you to control an unruly flash or add more light if you think your shots need them.

1. You can practise either with another willing sitter or simply with a still life subject. However, it's important you get in close. For the purpose of this task try and get between 50 and 100cm away from your subject.
2. Half press the shutter release and ensure you are able to focus at this close distance. If the camera fails to focus take a step back until it locks on.
3. After confirming focus ensure the camera is set to force the flash to fire.
4. Take a shot with the camera and review this test shot by switching the camera into playback mode.
5. It's likely the image will be very obviously overexposed. However if your camera features a histogram it would be wise to access this as confirmation. You can access the histogram by repeatedly pressing the Display button until it arrives at the histogram reading.
6. Typically the histogram is split into five segments representing from left to right, very dark (shadow detail), dark, mid (18% grey), light, and finally highlights. If the histogram shows the curve peaking in the fifth segment it's likely to be overexposed.
7. To correct overexposure we need to access the flash compensation, the symbol has a diagonally crossed square with a plus and minus symbol on either side of the line much like the exposure compensation icon with the addition of a lightning strike next to it.
8. Once you have selected this option from the camera menu, you can then adjust its value. This will start at 0.0 and can be adjusted by either rotating the camera's control dial or pressing up and down on the four-way navigation pad. Typically, the value will go up or down in 0.5 or 0.3 jumps - negative values will reduce the power of the flash and positive values increase it.
9. If your test image was overexposed, try reducing the power of the flash value by a third of a stop (0.3). Then retake the photo and check the histogram reading again. From the camera screen you should see the subject is less harshly lit, the histogram should show the peaks moving slightly to the left, pulling the curve away from the extreme right and curing the overexposure.
10. Try experimenting with the flash compensation to learn how your camera handles both close and distant subjects.

Think Print

The key to creating successful photos is to visualize, at the time of capture, the final print. If you give more consideration to your objective while setting the photo up, you're far more likely to arrive at the desired image. What this means in practice is simple exercises such as giving consideration to the size of the print you are likely to want. If you want a photo for a square frame, you need to visualize this as it will obviously preclude any images which spread across the frame all the way from left to right. If you always have your prints at 6x4 this is particularly important as digital prints aren't ideally suited to this size and typically lose some of both the top and the bottom of the image. You could simply print your photos at 7x5 but they won't fit in the album any more. In this task we will take several photos using the camera's frame differently each time - you can apply this task to any images, groups or still life.

1. First you need to arrange your scene to achieve the composition you are after - for this first section we are looking to capture a 10x8 image. With groups, don't be afraid to give people direction but remember to be friendly and clear.
2. Step back from your scene and quickly check that the light is appropriate - this is especially important for groups. Make sure everyone's face is unobstructed and isn't shadowed by any of the other group members.
3. Now that you have your image, once again visualize the squarer format of a 10x8 photo. With these constraints in mind, use your camera's zoom, or alter your position or even the group to frame your subjects - but remember to leave around 10% at either side of the image unused.
4. Once you are satisfied with the composition take at least two photos from the same position. With two photos from the same position you have a better likelihood of getting everyone's eyes open, and if someone blinked you can copy their eyes from the other image.
5. Repeat this exercise but this time we will try to compose the photo to be printed at 6x4.

Remember

A 6x4 print is narrower than 10x8, so when visualizing your composition you should ensure your sitters don't have their heads or feet too close to the top or bottom as they will be cropped off.

Composition

There are two basic skills involved in producing good photographs, the ability to see the potential in a subject or situation and the understanding of how much of it to include in order to create the most telling image.

The effectiveness of every image can be enhanced by good composition, which means the effective arrangement of lines, shapes and colours within the image area. Regardless of what camera and viewing system you use for your photography, you must try to arrange the subject elements within the outlines of the finder so they form a well-composed image. The focusing screen of a SLR camera is considered a good choice for composing and evaluating composition.

Be aware that compositional principles are not rules that must be followed every time you take a picture. Photography is only partially a science; it is more a form of art and personal expression. The principles are guidelines that usually contribute to producing a well-balanced image. The principles can be broken if your intent is to do something different or to do something that attracts special attention. You always attract attention with images that are out of the ordinary and different from the way we usually see things.

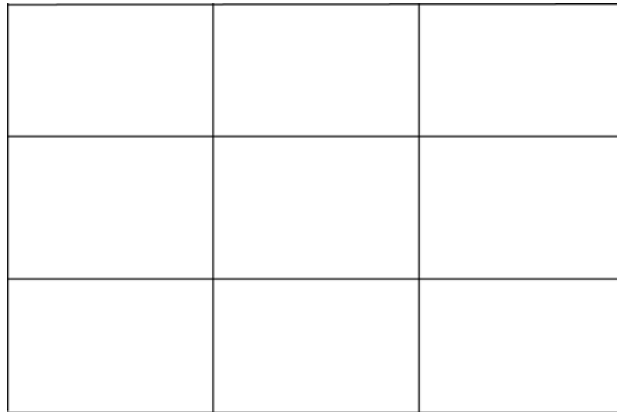
Composition involves more than the effective arrangements of picture elements. A picture must be free from distracting elements of any kind. An element can be more or less distracting depending on the degree of sharpness. The SLR focusing screen is beneficial since the degree of sharpness depends on the lens aperture. A highlight as a small point may be hardly noticed with our eyes, but may be distracting when seen through the lens as a large blurred circle.

Always examine the composition around all four sides to be certain no important lines or the frame of the image cuts subjects. The cutting point attracts the eye and may even make the eye move out the picture, something that must never happen to a photographic image.

The reason why many photographs disappoint is simply because they contain too much information in the image. You may not be close enough to your subject or you may not have framed tightly enough. The ability to select a particular aspect of a scene, and to arrange it in a pleasing way, is largely dependent upon the choice of the viewpoint. This is one of the most important decisions a photographer can make before taking a photograph.

There is a guide to the strongest positioning of your main subject within the frame, known as the rule of thirds. The recommended placement of a main subject in rectangular, square and panoramic photographs is approximately 1/3 from the left or right, and 1/3 from the top or bottom. This places an imaginary grid over the picture area, creating 4 off-centre intersections, which tend to be strong locations.

Rules of Thirds



The rule of thirds is achieved by creating a grid that tri-sects the image both horizontally and vertically.

On a page, canvas, or a sheet of film you can create equilibrium by grouping several elements on a common axis. In a peaceful landscape for example, we see the elements of our photograph aligned along the axis of the horizon.



Using the rule of thirds to arrange elements of an image along an axis helps to create balance.

You can also compose your photograph using the concept of positive and negative space. This concept strongly urges you to balance the mass of what is your subject, with the mass of that which is not. In other words, you need to pay as much attention to the background as you do the subject. Following this guideline creates images that are far from static, which constantly create interest for the eye, and yet are still balanced.

Common Composition Errors

No clear subject

Most pictures need a central element to attract the viewer's attention. The eye should be immediately drawn to the central element, then move to secondary elements.

Subject too small

This common problem has two easy solutions-either move closer to your subject or use a longer lens. Getting close to the subject is particularly important when working with a wide-angle lens.

Subject centred

Very few compositions work well with the main subject exactly centred in the frame. Position the subject so that the direction of action or the potential for action is toward the open part of the image area.

Horizon out of level

Pay attention to the horizon line and keep it square. Few things detract from an otherwise good picture as quickly as a tilted horizon. Also remember the Rule of Thirds and don't place the horizon line in the middle of the photo.

Lack of scale

Use perspective to give a sense of depth and scale. Foreground elements that give scale to the subject are particularly important when composing scenes.

Too many elements

Strive to simplify your images by asking yourself what you can eliminate from the scene. Try horizontal and vertical framing. Isolate your subject from competing elements in the scene by changing your position and lenses.

Distracting backgrounds

When the subject is set against a busy background, use a large aperture to create shallow depth of field and blur the distracting patterns. Avoid elements that lead the viewer's eye out of the picture. Also, beware of background elements that strangely bisect the subject. The classic example is the tree growing out of your friend's head.

Finally break all the rules by experimenting

Take a couple of images from several different viewpoints and find out what works best with your subject.

Depth of Field

As with the shutter speed, the aperture offers a very important facility in addition to the control of exposure. In addition to regulating the intensity of light that reaches the film, the diaphragm aperture is also used to control the depth of field. The depth of field refers to the area within which objects are acceptably sharp behind and in front of the point of focus. The key word is 'acceptably', for although depth of field is measured in finite terms and is shown as such on most lenses, it is really a subjective assessment.

If a standard 50mm lens is focused on 7ft and the aperture is f-8, everything in the scene from about 5 1/2ft to 10ft will be reasonably sharp.

Widening the aperture causes the depth of field to decrease. At f-2 the same lens will give a depth of field of only 11in behind and 9in in front of a subject 7ft away.

Narrowing the aperture increases the depth of field.

Learning how to control depth of field by varying the aperture is an important part of photographic technique.

If you want a large depth of field it is safest to use a small aperture, but to get enough light this may force you to use a slow shutter speed.

For action shots needing a fast shutter speed, you often have to open the aperture to compensate and keep a careful eye on the depth of field available.

The smaller the aperture, the greater the depth of field (f 22).

The larger the aperture, the smaller the depth of field (f 1.2).

The depth of field is dependent on 2 other factors:

1. The further away the point of focus is from the camera the greater becomes the depth of field. If you were to focus on the eyes of a model close up to the camera at full aperture (smallest f-stop) the tip of the nose and ears would be distinctly 'un-sharp'. If you increased the distance between model and camera to say 6 meters, not only would the model, but objects immediately in front and behind will be completely sharp.
2. Depth of field is not evenly distributed either side of the point of focus, it is greater behind than in front. Depth of field extends about one third in front of and two-thirds behind the point of true focus.

To record an image with the maximum depth of field, which would be the greatest sharpness of all points in the scene, foreground and background, the smallest possible aperture (largest f-stop) and a slow shutter speed should be used. Focus on a point at about a third of the distance between the camera and the furthest object.

To record an image with minimum depth of field that would reduce backgrounds to vague blurs, the largest possible aperture (smallest f-stop) and a fast shutter speed should be used.

O	O	O	O	O	O	o	o
f 2.0	f 2.8	f 4.0	f 5.6	f 8	f 11	f 16	f 22

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Focal Length

The normal focal length of a 35mm camera is about 50mm, which has an angle of view roughly corresponding to the human eye, the human eye covers 43°. Lenses with focal lengths of less than 40mm are considered wide angle lenses, lenses with focal lengths over 55mm are called telephoto lenses. Magnification, if using a 50mm standard lens, the magnification would be 0, if using a 200mm lens this would equal 4 times the magnification of the 50mm lens.

Field of View

Long focal length narrow angle of view. Short focal length wider angle of view. Point of focus = the subject matter, before and after the subject is out of focus. Image is acceptably sharp when focus around point of subject is reasonably in focus.

Distance from camera to subject

Direction of Movement to film plane

Slow movement, pedestrians, Children at play, slow moving cars (up to 15m.p.h.)

4m	1/125	1/250	1/500
8m	1/60	1/125	1/250
16m	1/30	1/60	1/125

Fast movement, runners, sports, vehicles moving (up to 30 m.p.h.)

4m	1/500	1/1000	1/2000/Panning
8m	1/250	1/500	1/1000
16m	1/125	1/250	1/500

Very fast movement, anything travelling over 30 m.p.h.

4m	1/500	1/1000	1/2000/Panning
8m	1/250	1/500	1/1000
16m	1 /125	1/250	1/500

TTL. Through The Lens

When measuring an exposure with TTL, the balance is set to 18% grey, the meter assumes that any given area has 18% grey, therefore if you shoot a white wall using TTL the film will be under exposed resulting in a grey wall, if shooting a blackboard the TTL will overexpose resulting in a dark grey blackboard.

Graphic File Formats

There are many graphic file formats, if we include the proprietary types. The PNG, JPEG, and GIF formats are most often used to display images on the Internet. These graphic formats are listed and briefly described below, separated into the two main families of graphics: raster and vector.

Raster formats

These formats store images as bitmaps (also known as pixmaps). For a description of the technology aside from the format, see Raster graphics.

JPEG

The JPEG (Joint Photographic Experts Group) image files are a lossy format (in many cases). The DOS filename extension is JPG, although other operating systems may use JPEG. Nearly all digital cameras have the option to save images in JPEG format. The JPEG format supports 8-bit per colour - red, green, and blue, and 24-bit which produces relatively small file size. Fortunately, the compression in most cases does not detract noticeably from the image. But JPEG files do suffer generational degradation when repeatedly edited and saved. Photographic images are best stored in a lossless non-JPEG format if they will be re-edited in future, or if the presence of small "artefacts" (blemishes), due to the nature of the JPEG compression algorithm (in most of the compressing tools), is unacceptable. JPEG is also used as the image compression algorithm in many Adobe PDF files.

PGF

The PGF (Progressive Graphics File) is a newly introduced wavelet-based bitmapped image format that employs lossless and lossy data compression. PGF was created to improve upon and replace the JPEG format. It was developed at the same time as JPEG 2000 but with a different focus: speed over compression ratio.

TIFF

The TIFF (Tagged Image File Format) is a flexible image format that normally saves 16-bit per colour - red, green and blue for a total of 48-bits – or 8-bit per colour - red, green and blue for a total of 24-bits - and uses a filename extension of TIFF or TIF. Tiff's flexibility is both a feature and a curse, with no single reader capable of handling all the different varieties of TIFF files. TIFF can be lossy or lossless. Some types of TIFF offer relatively good lossless compression for bi-level (black and white, no grey) images. Some high-end digital cameras have the option to save images in the TIFF format, using the LZW compression algorithm for lossless storage. The TIFF image format is not widely supported by web browsers, and should not be used on the World Wide Web. TIFF is still widely accepted as a photograph file standard in the printing industry. TIFF is capable of handling device-specific colour spaces, such as the CMYK defined by a particular set of printing press inks.

RAW

RAW refers to a family of raw image formats that are options available on some digital cameras. These formats usually use a lossless or nearly-lossless compression, and produce file sizes much smaller than the TIFF formats of full-size processed images from the same cameras. Unfortunately, the raw formats are not standardized or documented, and differ among camera manufacturers. Many graphic programs and image editors may not accept some or all of them, and some older one have been effectively orphaned already. Adobe's Digital Negative specification is an attempt at standardizing a raw image format to be used by cameras, or for archival storage of image data converted from proprietary raw image formats.

PNG

The PNG (Portable Network Graphics) file format is regarded, and was made as, the free and open-source successor to the GIF file format. The PNG file format supports true colour (16 million colours) whereas the GIF file format only allows 256 colours. PNG excels when the image has large areas of uniform colour. The lossless PNG format is best suited for editing pictures, and the lossy formats like JPG are best for final distribution of photographic-type images because of smaller file size. Many older browsers do not yet support the PNG file format, however with the release of Internet Explorer 7 all popular modern browsers fully support PNG. The Adam7-interlacing allows an early preview even when only a small percentage of the data of the image has been transmitted.

GIF

GIF (Graphic Interchange Format) is limited to an 8-bit palette, or 256 colours. This makes the GIF format suitable for storing graphics with relatively few colours such as simple diagrams, shapes, logos and cartoon style images. The GIF format supports animation and is still widely used to provide image animation effects. It also uses a lossless compression that is more effective when large areas have a single colour, and ineffective for detailed images or dithered images.

BMP

The BMP (bit mapped) format is used internally in the Microsoft Windows operating system to handle graphics images. These files are typically not compressed resulting in large files. The main advantage of BMP files is their wide acceptance, simplicity, and use in Windows programs. However, they may pose problems for users of other operating systems. Commonly, BMP files are used for Microsoft's Paint program. Since most BMP files are uncompressed, and BMP's RLE compression has serious limits the large size of BMP files makes them unsuitable for file transfer. However, Bit Map images are suitable for background images and wallpapers. This is especially true for screen shots. In addition, images from scanners are usually stored in BMP files.

HDP

The HDP format (formally known as WDP) is the newly introduced image format by Microsoft for media print quality, lossless image compression. This image standard has a specific applicability to mostly print media due to its size although it is rumoured to be the standard for Microsoft Office 2007 and the Windows Vista operating system. This format is very similar to the TIFF format, but can handle a much larger range of image types and qualities such as 8, 16, and 32 bits per channel processing, N-Channel support, and embedded tiling.

XMP

The XPM format is the default X Window System picture format (very popular in the Linux world). Its structure is based on the string format of the C programming language. Because XPM was designed to be human-readable, and is stored as uncompressed plain text, the file size of these pictures can be more than twice as large as uncompressed binary bitmap files (such as BMP, uncompressed TIFF, MacOS-PICT, or Irix-RGB formats). This format is unsupported by most non-Unix software and operating systems (though many web-browsers retain display support for the XBM subset, which was the minimal image format in the early days of the WWW).

Upgrading your Digital Camera

You have probably just bought your digital camera and are looking to develop your skills and hundreds of images before you ever entertain the idea of buying your next camera, but this section aims to offer some assistance when you do, with simple pointers to help you avoid any potential pitfalls. By breaking down the technical jargon we aim to fill in the gaps that sales people so effortlessly glide over, giving you the ammunition to ask the right questions and better still, understand their responses. We will start by looking in more detail at the elements of a digital camera.

Sensor

This is the heart of the digital camera, the part which records the image. There are two principal technologies that can be employed for the sensor, the first known as CCD, which is an abbreviation of Charge-Coupled Device, the second, CMOS or Complementary Metal Oxide Semiconductor.

Viewfinder

Until very recently, most compact digital cameras featured a small optical viewfinder. This simple lens allows you to bring the camera up to your eye rather than using the screen at arm's length. Viewfinders are a rare animal these days as many cameras use the space for increasingly large displays.

Display

As digital cameras share more and more features with video cameras, their displays have got larger and larger. Thankfully they have also been created with better contrast ratios and antiglare treatments so they can finally rival a basic viewfinder in bright conditions. The latest generation of compacts even incorporates touch-sensitive screens to replace many of the buttons.

Zoom Lens

Most compact digital cameras offer a three times optical zoom lens. Don't be fooled by claims of 12x or 15x lenses - these figures always include the less attractive digital zoom. If you want a bigger zoom you have to buy a bigger camera.

Mode Dial

By employing a dial most compact digital cameras can make accessing a number of scene modes intuitive, without having to navigate your way through a complex menu.

Power Switch

If you're looking for an easy-to-use compact camera, always try the power switch a couple of times. There's nothing worse than missing a shot because your camera is slow to start or you can't press the button easily.

Built-in Flash

Don't expect miracles from the standard built-in flash. They are designed to help with portraits in a darkened room, not light up a concert hall. If you really need to add light, try the flash combined with a longer exposure.

Focus assist lamp

Confronted with a dark environment your camera may struggle to find focus. This powerful LED will add just enough illumination to help the camera pick out its subject.

Zoom buttons/rocker

Depending on your camera, the zoom may be controlled with two buttons or perhaps a simple rocker. By moving the rocker or buttons to T you zoom in, and towards W, will zoom out.

USB socket

The USB plug or socket is the standard way of transferring your photos to a computer whether it's a PC or a Mac. Check if your camera uses USB 1.1 or the newer 2.0 standard, as this will dramatically cut the time to move your photos off the camera.

A/V socket

The A/V or audio video socket connects your camera directly to your TV, making it possible to watch a slideshow or playback any captured videos.

Power socket

Transferring images to your computer can be a drain on the batteries. You can purchase an optional power supply which allows you to power the camera without running down its batteries.

Microphone

Many cameras have a microphone mounted on the front to record sound in video. However, sometimes the microphone is located on the top, making it more suitable for dubbing existing stills. As with the flash, don't expect too much of these simple microphones - they don't rival those found in camcorders, yet.

Playback

To review any images taken on the camera, either move the slider to Playback or press the green playback triangle button. Pressing this button again will switch you back to record mode.

Speaker

While in playback, the speaker allows you to enjoy the movies with full sound.

Delete button

Careful with this one, pressing it gives you the option of deleting individual images or the whole lot in one go.

Battery compartment

Typically situated on the bottom of the camera. Digital cameras use either AA batteries or lithium ion power cells.

Memory compartment

Often shares the same compartment as the batteries. Your memory card must be installed correctly before you can start shooting. If you are in any doubt, read your manual.

Indicator lights

Many cameras have two indicator lights, the first tells you when the flash is ready, the second informs you when the focus is locked in.

Direct print button

With compatible printers, this button allows you to direct print without a computer.

Four-way navigation pad

Some digital cameras feature a four-way navigation pad. This helps you move your way around the camera's menu system.

Avoid shutter lag

Digital cameras were for a long time tarred with the reputation that they were slow and often missed great photo opportunities as they whirred and clicked, considering your requests before finally actually taking a photo. These delays were known as shutter lag and were symptomatic of the slower processors used in the first generations of digital cameras. Modern cameras have for the most part eliminated these problems but it's still good practice to review the specifications and see what claims the manufacturers make. As a rule of thumb, if the shutter lag is documented it's unlikely to create any issues, if you can't find any reference to shutter lag, alarm bells should be ringing.

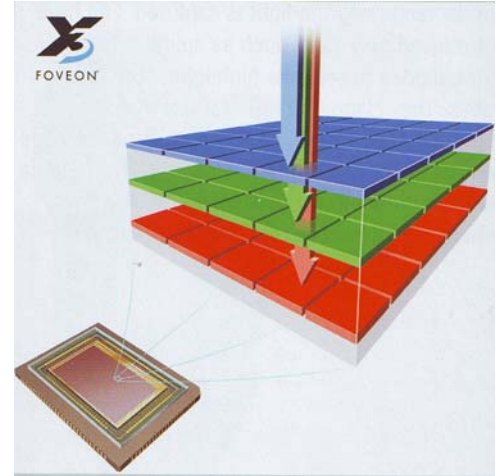
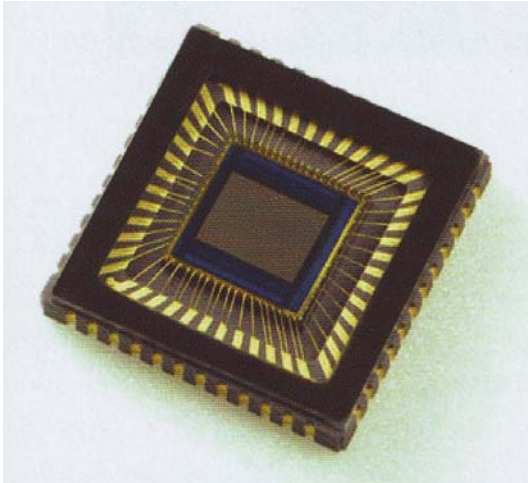
Don't be afraid to ask to test drive any potential purchases, this way you can get a feel for the responsiveness of a camera. Remember always half press the shutter release to lock the focus before completely pressing the button - this will show you the shutter lag. Other aspects of the camera to consider are the time to focus, this is often mistaken as the shutter lag and can be equally as frustrating when trying to capture spontaneous snaps of your children. Try focusing on near and distant objects in turn to see just how quick your camera can react.

What are megapixels?

For a digital camera to convert the available light into electronic data, the camera must incorporate millions of tiny light-sensitive photodiodes. These photodiodes then capture the light hitting them and convert the amount into data. However the process is complicated by the fact they cannot distinguish between colours, To enable the digital camera to record colours, the photodiodes have to be split into three, with each set having either a red, blue or green colour filter applied to their surface so that only that light can get through. The filtered photodiodes are then configured in a grid, so that there is always one of each colour close to another. This grid formation is known as a Bayar Pattern and is the basis of almost all digital cameras.

By putting the sensor in this mosaic style, the whole image is recorded. However, for each colour there are gaps between the data, thankfully the samples are close enough together to allow the brain of the camera to interpolate - which amounts to an educated guess at the missing bits. Each individual colour photodiode is known as a pixel, and a million of these are called a megapixel. When digital cameras were relatively new devices each new generation would boast almost twice as many as the previous generation.

This meant that the quality increased dramatically as the technology improved, however now that the gains are much smaller, the benefits of eight megapixel over seven are far less tangible.



This hasn't stopped enthusiastic marketing departments pushing their cameras on the strength of these higher numbers. Thankfully the emphasis of camera development appears to have switched very recently and manufacturers such as Fuji have begun to try and improve the fundamental way the light is captured. Fuji have introduced new ideas such as splitting the photodiodes to separate highlights and mid-tones. They claim that this can increase the amount of colours that can be recorded. Perhaps a more promising technology comes from Sigma who are working with a new Foveon sensor, which uses three layers of sensors. This way, every part of the sensor can record red, blue or green with no gaps between the photodiodes. Sigma claim this layered approach will deliver the most accurate colours available. However, as this system employs the photodiodes in layers you need to divide the number of megapixels by three - which unfairly, puts a lot of people off.

Lens

If you look at the numbers emblazoned on the front of a camera's lens and feel they are as alien as the calibre of a gun, then this section is aimed at you. On every camera one of the most important components is the lens. The quality of this part, however, is much harder for most people to identify. The problem is that camera manufacturers continually harp on about megapixels and zoom, areas where simple marketing can drum home a message that bigger is better however unqualified the claims are. They very rarely expend any energy telling you about the lens used. To help you understand what the specifications of a lens mean we have included a short guide.

F values

When you look at a zoom lens the front will typically have an F number, this figure represents the largest aperture available on the lens. The lower the number the better suited the camera will be to work in low light. As an example, a lens with F2.8 on it, might be well suited to use in low light. However, if the camera had instead, a figure of F4 it might struggle where the F2.8 could still cope. Most modern digital cameras incorporate an optical zoom lens, which will typically have two F values - these two figures detail the largest aperture at both ends of the zoom.

Focal Length

The focal length will also be present on the front of the lens. This, however, directly relates to the size of the sensors and as digital cameras use a variety of different sized sensors this information can be difficult to interpret. To make the specifications more intelligible, manufacturers provide the figures as they relate to a 35mm camera. You may need to look in the manual for this information but it gives you an idea as to

the perspective offered by the camera. If the camera offers 28-105mm it will be ideal for indoor photography or group shots. If instead it starts at 38-380mm you may find the camera better for sports.

Last, also keep an eye out for optical image stabilization, this helps keep the camera steady and improves your chances of getting a sharp photo.

Image stabilization (electronic – optical)

One of the most common problems people experience when taking photographs is camera shake. Even tiny movements of your hands can result in images which at best lack clarity or at worst are unrecognizable. It becomes harder to hold your camera still when the elements are against you, the light is failing or you're using a powerful zoom as this magnifies the shake as well as the subject. To combat these issues manufacturers provide image stabilization. This has the effect of ironing out the movements of your hand to aid you in difficult circumstances. There are numerous types of it available, although most can be put into one of two categories: electronic and optical. Electronic stabilization uses less of the camera's sensor to capture a photo, preferring instead to use the rest to smooth the camera's movement. Optical stabilization employs the whole sensor and relies on either a correcting lens or moving sensor to counteract any movement.

Jargon Buster

35mm equivalence

The standard measurements adopted by manufacturers, given that digital cameras have differing sizes of sensors, to give an idea of the focal range of a camera lens, for example, a typical 3x optical zoom would be an equivalent of 35-105mm.

AF servo

Refers to a camera's ability to continually focus on a moving subject, sometimes called AI Servo or Continuous. This focus mode is ideally suited to use with sports events or motor sports. To start the process of focusing, the shutter release typically needs to be half pressed - on higher-end cameras, the camera will even continue to adjust its focus as the image is recorded.

Aperture

The hole through which the light travels. In photography, the term is used to describe the diameter of the diaphragm, which controls the access of light. Using a larger opening, more light comes in, creating an image with a shallower depth of field, with a smaller opening the camera takes longer to get the same light, but the image has a larger depth of field.

Aperture priority

Cameras equipped with this mode allow you to select your desired aperture value, whilst automatically adjusting the shutter speed to ensure the exposure is still correct for the image. Aperture priority mode can be useful for controlling depth of field.

Artefact

Most commonly used to describe problems attributed to the JPEG compression used by digital cameras. JPEG compression allows many more images to be stored on a memory card than would otherwise be possible, but poor implementation can introduce a stepped appearance to normally smooth lines, or unwanted patches in solid colours.

Auto-bracketing

This is taking a series of shots, usually between three and five, with exposures slightly above and below the suggested metered exposure. It is used to deal with situations where there are both very bright and very dark elements.

Backlit

This is where a sitter is photographed with their back to a bright light source which can fool the camera into capturing them as a silhouette. This is caused by the camera trying to weigh up the darkness of the subject and the brilliance of the background. Using a fill-in flash can help to balance the image and ensure the subject is correctly captured.

Barrel distortion

This describes the effect where, for example, the lines of a door frame bow gently outwards. It is one of the results of the balance between flexibility and picture quality - the long zoom sought by camera buyers means that the lens has trouble ensuring the lines in the image are straight at its widest point.

Blooming

The millions of tiny receptors in a camera's sensor act like tiny wells. If a bright area saturates its well the excess sometimes spills into neighbouring ones. This overflow artificially increases the brightness of the surrounding areas. To lessen or avoid this 'blooming' modern digital cameras use gating systems.

Burst mode

Otherwise known as continuous shooting - it is when the camera takes a series of photos in rapid succession giving you more chance to get the crucial moment. Useful when photographing sports. Cameras are often quoted with a FPS or frames per second.

CCD

Stands for Charge-Coupled Device, which forms the basis of most modern digital cameras. The alternative to the technology is known as CMOS or Complementary Metal Oxide Semiconductor - this was historically used for low-cost cameras as it was inferior to CCD but cost less to manufacture. However the two technologies now offer identical results at similar costs.

Chromatic aberration

Simply means that the colours on the print are out of alignment. Different colours of light have different wavelengths which are bent by the elements of camera lenses at slightly different angles. Unless the lens has additional correcting elements the print will show slight red and blue edges on high-contrast subjects. See also: Fringing.

Colour accent

This converts a colour photo into black and white leaving only one colour element such as a bridal bouquet, which provides a bold contrasting detail.

CompactFlash

One of the oldest memory formats and also one of the largest. This physical size means that manufacturers no longer provide support for it in compact digital cameras but in the professional field it remains a firm favourite and is used in nearly all DSLR cameras.

Compression

There are numerous ways of compressing images but they fall into two camps: lossless and lossy. Lossless compression is when the image is squeezed into a smaller file but when it is reopened the original file is identical, no information being lost in the process. TIFF files can be compressed in a lossless way, With lossy compression the file can be squashed much smaller making it more suitable for transfer or web usage but when the image is opened again the result is a representation of the original but some of the quality is lost. JPEG files carefully balance image quality against file size but the process still involves some loss of quality.

Cropping

Term used to describe how photographers block out or trim off those parts of an image they don't want to use.

Depth of field

The distance between the nearest and furthest points that a camera has in focus. Adjusting the camera's aperture directly controls this area. Higher F numbers such as F22 can offer almost infinite depth of field, whereas lower F numbers such as F2.8 are more suitable for portraiture as they offer a very limited focus area.

Digital zoom

Unlike an optical zoom lens, digital zoom doesn't use the lens to magnify the subject. Instead the camera discards some of the light hitting the sensor opting instead to use just the centre portion. This has the effect of making the image appear magnified. However, as less of the sensor is used it does have the drawback of reducing the picture quality.

Electronic viewfinder

Used to simulate the experience of using a single lens reflex camera. It can relay the live image coming in through the lens without having to incorporate another bulky lens solely for the viewfinder. Another benefit of an EVF is the inclusion of the current shot settings. Often associated with cameras with powerful optical zooms.

EXIF

The Exchangeable Image File or EXIF header is information embedded in the image file itself. It records details of the exposure, type of camera and, if you have entered it, the time and date.

Exposure compensation

This allows you to override the camera's choice and force it to lighten or darken the exposure. Useful when conditions mean that the camera will struggle to produce the desired results on its own.

Focus and recompose

Auto-focus cameras often try and focus on the centre of the scene, which may not be the part you want to be sharp. By pointing at the subject first then recomposing the image you get around this.

Focal length

This is the distance in mm from the centre of the lens to the focal point when the subject is at infinity and in sharp focus. In a digital camera the focus point is the sensor. Focal length is normally represented as mm on the front of the lens. However, for these figures to be useful you need to know the 35mm equivalent - everything lower than 35mm is considered wide angle, over 80mm is normally referred to as telephoto.

Focal length multiplier

Conventional lenses can be used on some digital SLR cameras but these have a smaller sensor size than conventional 35mm film, meaning that the focal length offered by the lens produces a different field of view, with a narrower perspective. This effect is known as a Focal Length Multiplier. Typically, most entry-level digital SLRs have a 1.5x or 1.6x multiplier - this means that the bundled lenses which offer such alien focal lengths as 18-55mm actually produce similar results to a more conventional 29-88mm.

Format

Removes all data from the storage being formatted, similar to simply deleting your images but the process is more thorough.

Fringing

Similar to chromatic aberration, and also caused by the differing wavelengths of light not being sufficiently corrected for. Fringing however, occurs at the camera's microlenses. On some sensors, tiny lenses are added to help funnel the light into the small receptors. Icon-graphical representation of a mode or setting. Typically used to indicate a preset exposure setting such as portrait or sports mode.

Interpolation

Use of a complex mathematical calculation to produce a larger image than was originally recorded. It has the effect of producing images that offer a higher megapixel count than the sensor itself physically offers.

JPEG

Stands for Joint Photographic Experts Group, a committee of specialists who defined the ISO 10918-1 standard in 1992 - the term refers to a form of compression designed to significantly reduce the storage requirements of photographic images. It is a lossy compression, meaning that some of the original information is lost, and as a result, some of the quality. See also: Compression.

LCD

An abbreviation for Liquid Crystal Display - describes the technology used in most modern digital cameras to provide a real time view and review screen. Often used as a generic term although manufacturers have many new technologies such as OLED, these more advanced display technologies promise to provide better battery life whilst still being big enough and bright enough to use in direct sunlight.

Macro

The macro setting on a camera allows you to focus the lens very closely. By focusing only a short distance from the lens, cameras can capture very fine detail on smaller subjects. Typically used for insects and plants, the icon for macro is, in fact, a simplistic flower.

Megapixel

One million pixels. The light coming into a camera's lens is recorded on a sensor, or CCD, made up of thousands of individual receptors known as photosites or pixels. Modern cameras are typically measured in eight to twelve megapixels. While it is true that the more megapixels the bigger the image is, it doesn't directly relate to quality.

Memory card

The digital equivalent of film, and where images are stored. (it is not sensitive to light, but it is good practice to take care of it.)

Memory stick

The memory format used by Sony to store images. It has numerous different physical formats with PRO, DUO, Micro and PRO-HG. Each new format is smaller, faster and has increased storage capacity to enable smoother video or faster burst speeds.

Noise

To photograph in low light or to use faster shutter speeds with conventional film cameras a higher ISO rated film is often used. Its chemicals react faster to light but it has a more obvious grain. Digital cameras emulate this film by amplifying the signal which can introduce unwanted coloured pixels or 'noise' into the photo.

Pincushion distortion

A characteristic effect of bad lens design as manufacturers try to squeeze the most flexible zoom they can into a camera design. The resulting poor image quality can be seen when looking at the lines of a window, often the straight frame will curve gently inwards.

Pixel

Short for picture element, it represents the smallest part of an image.

PPI

Pixels per inch - a measurement of the resolution of images. If your images are going to be printed, it should be set to 300ppi, the standard resolution used by many commercial printers but for the Web, 72ppi is more suitable.

Changing the PPI changes the image's output size but it does not change the total number of pixels in the image so that there is no impact on image quality.

RAW

Simply means raw or unprocessed, it is not an acronym. Choosing to use RAW files means that you tell the camera to leave the images alone, allowing you to make decisions on the sharpness, colour and compression of the image later when you convert it on your computer. This is instead of allowing the camera to process the image to convert it to JPEG or TIFF.

Reflector

A fold out disk or panel with a reflective white, silver or gold surface. Reflectors are normally used in portrait or studio work to direct light in order to lighten any darker aspects of the image.

Scene modes

Digital cameras include numerous scene modes to take the guesswork out of configuring the camera. For example, when taking portraits, a narrow depth of field is generally preferable as it draws attention to the model rather than the periphery. By selecting portrait mode the camera elects to use the largest available aperture.

Shutter priority

Allows you to specify exactly what shutter speed you require to create your exposure. However, in order to achieve this the camera automatically adjusts the aperture value to ensure the exposure is still correct.

Shutter release

The button which releases the shutter and allows it to momentarily snap open and shut exposing the sensor to light.

Shutter speed

The speed at which the camera allows the shutter to open and close allowing light in to create an exposure. It is normally measured in fractions of a second, but longer exposures can be several seconds or more.

TIFF

Stands for Tagged Image File Format. It works in a similar way to JPEG but can compress photos without any loss of quality. TIFF files also have the advantage of being able to support layers. As a result, while some digital cameras do support TIFF files it is far more likely that you will encounter them while using a photo editing package.

TTL-metering

TTL stands for Through the Lens and is usually used in the context of how cameras interact with a flash. Using TTL, the required exposure is measured from the light travelling directly down the camera's lens. When firing a flash, the sensors in the camera can then adjust the flash's output, ensuring the exposure is as accurate as possible.

TWAIN

Not officially an acronym, it stands for Toolkit Without An Interesting Name and is the industry standard for communication between scanners, printers and applications. Before it was established in 1992 getting, for example, your scanner to talk to your PC could be a very hit and miss affair.

Unsharp mask

A tool within modern photo editing packages used to sharpen a photo. Its contradictory name originates from a printing technique that used a slightly blurred positive image combined with the original negative to create the effect that the final print was sharper.

USB

Abbreviation for Universal Serial Bus - by far the most common way to connect a digital camera to a home computer. Identify the presence of a USB by looking for its trident icon. Unlike older methods, it allows for new accessories to be connected safely while the computer is still turned on. There are currently two types of USB, 1.1 and 2.0, the latter is over 40x faster than its predecessor.

White balance

Digital cameras come equipped with numerous preset white balances, including tungsten, daylight, cloudy, etc. These settings are designed to compensate for the differing wavelengths of light coming from the different light sources their names represent. For example, photographing under a fluorescent strip light without selecting the correct white balance is likely to give the image a blue appearance.