

Going Manual

Take control of your photography.

A Guide To Digital Photography and Post Processing

By Simon Andrews

The e-book to accompany the website
www.GoingManual.com

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Introduction

pho-tog-ra-phy [*fuh-tog-ruh-fee*]

n.

1. The art or process of producing images of objects on photosensitive surfaces.
2. The art, practice, or occupation of taking and printing photographs.
3. A body of photographs.

The word photograph simply means a recording of light. Learn to see in terms of light and color, to compose well and capture the scene in front of you. Just as you intended.

Is your expensive digital camera not getting the shots you want? It's easier than you think to get the most from your investment. You can control how you record the world you see and understand the relationship of aperture, shutter speed and ISO. Together with a study of composition you'll master the basic ingredients of photography.

At the www.GoingManual.com website, you'll have constant support and assistance as you try what you learn, while reading this book. Move at your own pace and ask for help at the website whenever you need to. In no time you'll be sharing your advice with other people!

This guide is based around some simple principles:

- Have the right camera for your needs.
- Understand the relationship between aperture and shutter speed.
- Learn to see creatively and with good composition.
- Know how to use the digital darkroom to make the best from your photos.

Part I – Gear

To use this guide you will need a camera that has a manual setting or at the very least a semi-auto setting. You'll need to know how to change the settings of your camera too so keep your camera's manual handy or look online for the info.

This guide assumes you already have a camera, but if you're thinking of upgrading here's a few notes to think about. The two basic type of camera we'll be looking at are DSLR (digital single lens reflex) and fixed lens. SLR cameras typically have interchangeable lenses while fixed lens camera usually don't.

The Camera



This is my wife's Canon Powershot A540. A relatively cheap 6Mp camera with 4x zoom and a nice size LCD screen. It can also be set to manual to give you back creative control. You can even change the lens for close up and there's a waterproof case available to take it underwater.

The picture quality is perfectly adequate for all my wife requirements.

This is my Canon Digital Rebel XT. It has a small body, so is a great DSLR for traveling and backpacking. It is 8Mp and like all SLRs you can change the lens.

Here it's fitted with the 18-55mm 'kit' lens that has produced saleable 16x20.



To completely control how you take your photo you must have a M or manual setting to control the aperture, shutter speed and ISO and manual focus.

The pros and cons of different types of camera come down to personal preference, budget and what the camera will be used for. Some point and shoot cameras can offer the same manual control as a SLR when taking pictures but don't offer the same lens flexibility. However some fixed lense camera have built in zooms that are equivalent to 28-300mm or more. Not many single SLR lenses will cover that range. A single camera can save carrying around a bag full of lenses too. Great for backpacking trips or where weight and size are a consideration. Because you get so much in one camera you will make a cash saving too. For less than \$400 you can get a fixed lens camera, body and built in lens, while a DSLR body starts at the same price before you buy you first lens.

The advantage of an SLR camera is flexibility. You can choose the right lens for the shot you want and there is no restrictions built in. A fixed lens may be a jack of all trades and but is too often a master of none.

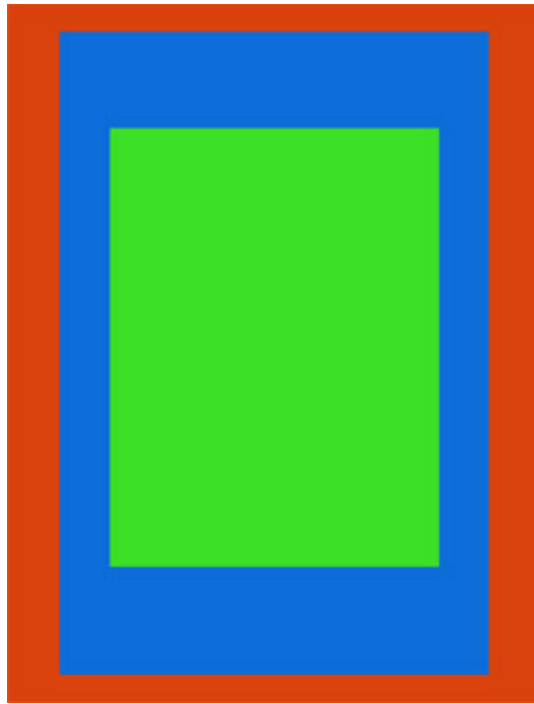
Focus

Focus is often faster on an SLR. Manual focus, if available, eliminates the frustrating delay between hitting the shutter release to the shot actually being taken. Manual focus is useful from time to time but auto focus systems have become so sophisticated, you'll not find yourself needing it too often. Continuous auto focus is really cool. You choose the focus point in your viewfinder and the camera will maintain focus on an object moving toward, or away, from you. Check out the focus options in your camera's manual. The more freedom you have to focus where you choose, the more creative freedom you have to make the kind of picture you hoped for.

Resolution

No, not your annual promise to jog every day to a salvation army soup kitchen, while learning the guitar, not buying cigarettes and spending less. A completely different kind of resolution, that's much easier to achieve.

Resolution is a count of the number of pixels. Pixel is short for **picture element**, using the abbreviation 'pix' for 'picture'. Pixels are the colored dots that make up the image. It follows that the more dots there are in a given area, the more realistic you image will be when viewed at a greater size. Today you'll see typical resolutions of between 5 and 12 megapixels, or Mp for short. More megapixels will allow you to print the image at a greater size. There isn't much difference between 6Mp and 8Mp so don't let that be a deciding factor when choosing your camera. Look at the features, read reviews and let the number of megapixels be one of the deciding factors, not the only one.



A 3Mp, 6Mp and 8Mp relative comparison

MegaPixels Vs Print Size

The number of megapixels relate directly to how large a digital file can be printed. The other factors governing the final print are D.P.I and quality. D.P.I. stands for dots per inch. More dots equals more detail and so higher quality. 72 DPI will not look great, unless viewed from a distance, and the drop in quality will be noticeable. The trade off is a much larger print size. Simply put, more megapixels means you can print bigger.

Mega pixels	Pixel dimensions	Just acceptable* 72 D.P.I.	Reasonable* 150 D.P.I.	Very Good* 200 D.P.I
1	1225 x 816	17 x 11	8 x 5	6 x 4
2	1732 x 1155	24 x 16	12 x 8	9 x 6
3	2121 x 1414	30 x 20	14 x 9	11 x 7
4	2449 x 1633	34 x 23	16 x 10	12 x 8
5	2739 x 1826	38 x 25	18 x 12	14 x 9
6	3000 x 2000	42 x 28	20 x 13	15 x 10
7	3240 x 2160	45 x 30	22 x 14	16 x 11
8	3464 x 2309	48 x 32	23 x 15	17 x 12
9	3674 x 2449	51 x 34	24 x 16	18 x 12
10	3873 x 2582	54 x 36	25 x 17	19 x 13

*Dimensions in inches

Print publications require high quality 300 D.P.I. But 200 D.P.I. will provide very

acceptable quality for all but the most demanding gallery exhibitions.

There is a difference between an 8Mp DSLR and an 8Mp fixed lense camera. Fixed lense cameras usually have similar size bodies but smaller sensors e.g. the Sony DSC-F828 - a so called 'prosumer' (professional/consumer) camera looks very much like an SLR. The sensor size however is just 8.8mm x 6.6mm compared to the 23.7mm x 15.6mm of a Nikon D50. The very small sensor suffers more from electronic noise, a grainy effect in the image caused by electronic interference, as the sensor records what it sees.

Sharpening

Sharpening can be done 'in-camera' and point and shoot models don't usually have the option to turn this off. I set mine to zero in-camera and always sharpen in post processing. There is a tutorial to teach you more in the post processing section.

Semi Auto Settings

These can be useful too saving you time when you want to get a shot quickly, or if you don't have a manual mode.

Aperture priority (Av): You choose the aperture setting and the camera choses the best shutter speed.

Shutter priority (Tv): Can you guess? Yep, you set the shutter speed and the camera chooses the aperture.

Tip:

When ambling around groups of people looking for candid, I usually keep my camera set at Tv 1/60s (up to 60mm lens or 1x zoom) to freeze normal human movement and to provide the largest possible depth of field for hand holding.

I preset Av to a wide setting to give a short depth of field and, usually, a faster shutter speed. This allows me to quickly switch to a different creative setting, blurring the background of my subject. It also to gives me the option of a quick change from Tv at 1/60, to provide a high shutter speed it the actions hots up.

You still have a lot of control even if your camera only has the semi-automatic settings. You can convince the camera's brain there's more/less light than there is using the exposure compensation feature or lock the exposure for part of a scene so the exposure isn't thrown off any excessive bright or dark areas in your scene. Check your present or next cameras manual for 'exposure compensation' and 'exposure lock'. Have a look online at www.GoingManual.com and post anything you find out.

Zoom and Focal Length

If your point and shoot camera had optical zoom it was probably represented as 3x, 4x etc. Focal Length is used to describe the same thing, and is expressed in distances such as 28mm, 300mm etc. If you have a point and shoot, see if it says 'equivalent to 28-480mm' or something similar. Focal length is the distance from the film or sensor to the center of the lens. The optical center is the part of the lens actually focusing the light and not necessarily the glass on the front of the lens. Some lenses are adjustable so a lens such as a 70-300mm will move the optical center of the lens between the two distances that are usually written on the side or front of it.

But what do the numbers mean? Simply put big numbers mean big zoom, small numbers mean wider angles of view. Just like your old point and shoot the higher the zoom the smaller the area in which to frame your scene.

Tip:

A 50mm lens will record a natural image with the least lens distortion caused by wide angles and no zoom. It most closely records what your eyes see.

It's good practice to learn how much of a scene you can record with your different lenses. Remember how much you can see through the rectangle of the viewfinder with each one or different setting. When looking for shots you'll have a better idea of what you can capture without having to hold up the camera.

Also consider that the camera will capture slightly more than you see through the viewfinder. Typically what you see through the viewfinder is about 95%. Even though this extra bit is visible on your PC monitor it's often lost when printing. If you have detail close to the edge, add a small border in post processing to get around this.

A Note About Sensor Size

Most SLR lenses are designed for 35mm film cameras or the equivalent 'full frame' sensor cameras. Most DSLR's have a sensor smaller than 35mm and only some of the most expensive DSLR's have full frame sensors.

A DSLR camera with a smaller sensor would have the same effect as cropping out the section on its full frame or film equivalent. Imagine drawing a slightly smaller box on a printed photo. That's the same effect the smaller sensor has on your lens, it will reduce the usable area of a lens.

So a 28mm wide angle lens will frame a scene as if you had used a 44mm (longer focal length = smaller area to frame your scene). The factor of change is dependent on your camera sensor size and you can find out on the internet or in your camera's manual.

Typically 1.6 is used to convert apparent focal length. Remember it doesn't really change the focal length of the lens, a 28mm will always be a 28mm and it won't increase the zoom either as some people will tell you!

Tip:

Nikon have a range of lenses that are only for their small sensor DSLR's. They allow the full value of the focal length to be used without any cropping effect.

Full frame sensors are more expensive and will likely stay that way. The price tag reductions we're used to with computers may not be reflected in the DSLR market. The cost of a chip is typically calculated per square mm for microchips. The cost savings in PC's come from producing smaller chips. As DSLR's are trying to increase size the cost is unlikely to come down very much. Let's hope the major manufacturers can find a way to prove me wrong, I won't mind at all.

Other Camera Features

Viewfinders

Electronic viewfinders are not usually on SLR cameras although advancements in technology will probably make this possible. A mirror reflects light from the lens to the viewfinder (hence SLR = Single Lens Reflex). When you hit the shutter release the mirror swings out of the way and gives that signature clunk noise. Electronic viewfinders are useful but can cause problems because it's harder to steady the camera if it's not close to your body and they eat up your precious batteries.

Lens Hood

Attaches to the front of the lens to prevent light flaring on the lens. It also provides good lens protection too.

LCD screen

The LCD screen isn't a viewfinder on a DSLR but it can be used to great effect to review your images and represents the biggest advantage of digital over film, instant feedback! You can review your camera settings without having to take notes and view your histograms to check your exposure (explained later). To help see the screen in bright light you might consider using a LCD hood to help cut out ambient light. They stick to the screen surround and fold out to help you see the image.

Tip:

When reviewing images zoom in to check the image is still sharp when viewed at full size.

White Balance

White Balance will help white look white when lighting or other external factors throw the light meter off. There are probably a few presets on your camera for different types of light. This can also be achieved in post processing, especially when using RAW format.

Extra Equipment

Tripod

A Tripod is usually needed when your shutter speed drops below 1/60 or when using longer telephoto lenses. The sturdier the better, with legs that lock and spread wide to give maximum stability. The head should let you move the camera into portrait and landscape positions easily. A reversible center column lets you get down low. Liquid filled bubble sight levels are useful for keeping horizons level. If you're tall consider how high the tripod extends, and for storage and carrying, how much it collapses. A quick release head is handy to remove the camera quickly but if it doesn't have a safety lock it's easy to knock it accidentally.

Cable Release

A cable release plugs into the camera to allow remote triggering of the shutter. Useful to eliminate hand shake on cheaper tripods and to allow you to come out from behind the camera and interact with your subject. Infra red shutter releases are also available for some camera models.

Tip:

Cable release extension cord is very expensive. If your camera uses 2.5mm jack plugs, buy 'step up' and 'step down' converters to 3.5mm from any electronic parts store. You can then purchase extension cable for regular stereo equipment instead of the expensive proprietary branded cable. I found 6 meters for a dollar!

Filter Systems

Filter systems typically screw onto the front of the camera and help you capture your image as intended. Some systems are very complex (see www.cokin.com and www.tiffen.com) while other filters simply screw directly onto the front of your lens.

Polarizers

Polarizers are indispensable, and neutral density (ND) filters are useful too. With digital it's possible to add many of the effects filters provide in post processing, however these two will be very useful and help where even post processing can't!

External Flash

External flash attaches to the bracket on the top of the camera, called the hot shoe, and is more powerful than on camera flash. It's useful for reducing red-eye, caused by the flash bouncing off the back of the eyeball. The further or higher above the camera lens the less likely you will be to get the red reflection. It allows you to bounce the flash off walls and ceilings to give a softer light and less harsh shadows. Be careful when the walls are colored as the flash will pick up color and tint your subject. Multiple external flashes can be linked to provide complex lighting solutions. A diffuser is a good companion to a powerful flash. It's a translucent cover that softens the light from a flash. Gels are colored heat resistant plastic sheets to add color to your flash.

Studio Lighting

Strobes, extra external flash units or hot lights (constantly on bulbs), all have their advantages and disadvantages. You can set up studios on a large scale to photograph anything from groups of people, cars, even aircraft or on a tiny scale for up close 'macro' work. Prices can range from a few dollars for a macro studio made from parts available in any hardware store, to an almost open ended scale. You can get big, bright lighting from a hardware store that will meet the needs of most people on a budget. Make sure you set your white balance correctly for the type of lighting you choose. You may need to set it manually. Consult your camera's manual or look online for details on how to do this. Post what you find on www.GoingManual.com and you'll be helping others who need the same info.

Reflectors

Reflectors come in handy to fill in shadows and reduce contrast. Collapsible ones are useful when traveling but they can be made from white paper or aluminum foil. My first reflector was 4 bamboo poles taped together with scrunched up and flattened foil (scrunched to avoid hot spots) on one side and paper on the other. Often paper and material may look white but might not be pure so watch out for subtle colors tinting your subject.

Tip:

Using colored reflectors can add warmth (reddish tones) or coolness (blueish tones) to your subject.

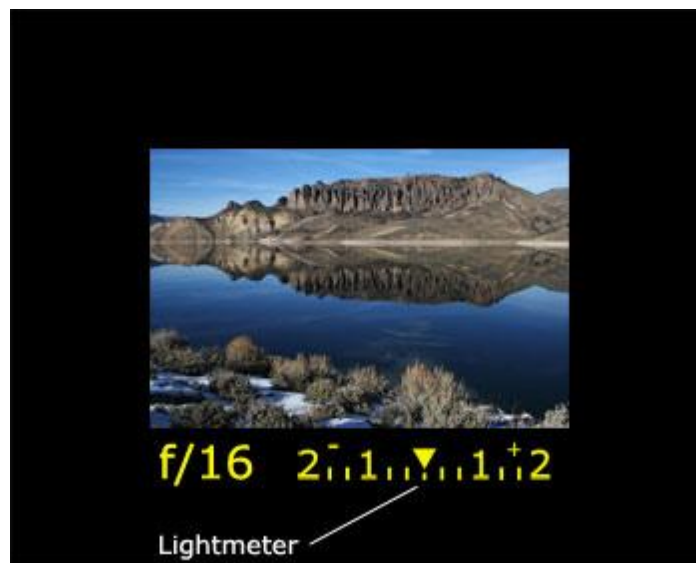
Part II – Capturing The Scene

Your First Manual Photo

I want you to learn by experience and practice, so let's get to it and take a manual picture. You will need to know how to change your aperture, shutter speed, and if you can, your ISO on your camera to use this guide. Due to the hundreds of different camera types that this guide can be used with, you'll need to use your camera's guide to find out the information. You may be able to find it online. Look on www.GoingManual.com to see if someone has posted the instructions for your camera. If they're not posted and you do work it out, why don't you post them for the next person.

Look at your camera and set it to fully manual. Some cameras including SLRs will have an M setting on the dial and other camera types may have it hidden in the menus. If you can't set it to fully manual then you'll have to wait until we get to the semi-auto settings.

Choose a well lit scene. Set the shutter speed to 1/60. Look through the view finder and half press the shutter release. Adjust the aperture until the light meter's needle in the viewfinder, or on the LCD screen, is in the middle. Frame your scene and hit the shutter release. Some cameras use a different method to represent the light being metered. However it's represented on your camera there should be a + (or over) and - (or under), represented. Consult your camera's manual if you're not sure.



Through the viewfinder

Congratulations you have gone manual! Now, let's find out what you did!

Just for fun, post your picture in the 'My First Manual Photo' forum. My first manual picture was of my foot!

It's All About Exposure

The Light Meter

The light meter is the needle either on the screen on the back or it's visible in the viewfinder when in manual mode. It tells you how much light is coming through the lens and is a crucial tool in going manual. This type of meter is abbreviated to TTL (Through The Lens). Usually it sits in the middle when the camera is set for a correct exposure. Half press the shutter release to activate it. Different cameras have different ways of representing how much light is in the scene. Consult your camera's manual to see how yours does it.

Exposure Explained

A modern camera has a film or digital sensor to record the light but you or the camera's brain have to decide how much light reaches the sensor. Too much light and the picture will be too bright, losing detail. This is called **overexposure**. Too little light and the picture comes out too dark or dull. This is called **underexposure**. We are seeking the **correct exposure**, where just the right amount of light reaches the sensor. Because this book is geared to digital photography, I'll talk about sensors but it's just as relevant to film users too.

Tip:

A camera's light meter is easily fooled. When we understand how to go manual, our brain can compensate where a camera's brain cannot.

Controlling Exposure

So how do we control how much light reaches the sensor? Three things work together:

Aperture
Shutter Speed
ISO

Aperture is a mechanical iris that can be adjusted from a large (wide) opening to a pinhole size. The smaller the hole, the less light can reach the sensor. The size is variable because it allows us to create different effects. Intentionally blurry foregrounds or backgrounds are achieved because of the aperture. More about its creative uses later - for now remember big hole equals more light reaching the sensor, small hole equals less light.

Shutter speed is a bit more simple. The longer the shutter is open the more light reaches the sensor. A fast shutter speed will freeze action while a slow shutter speed is useful for low light and will also produce blur, which can be desirable sometimes. An example would be giving water a milky appearance on waterfalls. We use different shutter speeds depending on how fast the action is in our chosen scene and what creative effect we want to produce. The many creative uses will be discussed later.

ISO stands for International Standardization Organization and is accompanied with a number 50, 100, 200, 400, 800, 1600 etc. Note the number doubles each time. The number represents how sensitive to light the film or sensor is. Each number increase represents a doubling of that sensitivity. The higher the number the more sensitive to light.

Put these three things together and you can control how much light reaches the sensor. Imagine you're taking a picture of the scene outside your window. A fast shutter speed and wide aperture can let the same amount of light through as a small aperture and a slow shutter speed.

Fast shutter speed = less light
Wide aperture = More light
Result = correct exposure

Slow shutter = more light
Small aperture = less light
Result = correct exposure

Of course the actual settings you use will depend on how much light is in the scene you intend to capture.

Creative Effects

Let's take some more pictures, play with the settings and see what we get. We'll need to put the camera on a tripod or flat surface as our shutter speeds will get too slow to hand hold. If you don't have a tripod yet, a cushion or small bean bag is useful. The settings you will use depend on how bright your scene is. I'm not going to give you both shutter speed and aperture as I can't know the light conditions where you are shooting. I'll give you one and using your light meter you're going to determine the other.

Tip:

A shutter speed of less than 1/60 is difficult to hand hold and below 1/40 is almost impossible. To avoid blur caused by hand shake keep your shutter speed at or above 1/60 for a normal (non-telephoto) lens.

Aperture and Depth Of Field

First let's play with the aperture. To see the full creative effect, frame a scene that has something in the foreground, middle-ground and background. Items on your desk or in your yard work just fine.

When you look through the viewfinder the aperture is completely open. When you release the shutter the aperture closes to the required setting. So you won't see the creative effects until you review your picture on the LCD screen.

You're going to adjust both aperture and shutter speed. If your shutter speed is below 1/60 then use a tripod, beanbag or cushion to rest your camera and use the timer (or cable release if you have one) to fire the shutter.

Set it to its widest setting, that's the lowest f/number. An SLR lens is rated by how wide the aperture will go and is usually marked on the side or front. I'll start at f/1.8 although the widest setting on your lens might be f/5.6 or more.

Frame your scene in the viewfinder and look at the needle in the light meter. Adjust the shutter speed until the needle is in the middle. It will probably be quite high. The actual number depends on how bright your scene is and might be different to mine. Why is explained later and usually makes your head hurt the first time you try to understand. So for now enjoy the simple art of photography, the nuts and bolts are coming.

Focus on the nearest item in your foreground. Now, with your aperture at its widest setting and the shutter speed adjusted to get the needle in the middle, you can take your picture.



f/1.8, 1/25 sec, ISO 100

Now change the aperture to somewhere in the middle, I'll choose f/8. Again frame the same scene and adjust reduce the shutter speed until the light meters needle shows a correct exposure. Focus on the same nearest item again.



f/8, 1/2 second, ISO 100

Now for the final picture set your aperture as high as it will go. I'm using f/22. Set the same scene. Adjust your shutter speed, again if your shutter speed is below 1/60 then use a tripod, beanbag or cushion to rest your camera and use the timer or cable release to fire the shutter.



f/22, 5 sec, ISO 100

Review and compare your three pictures. Notice how in the first one only the item nearest the camera is in focus. But in the last the whole scene is in focus. The depth of the scene that remains in focus from front to back is called the 'Depth of Field' and is abbreviated to DOF.

A wide aperture (low f/#) produces a short DOF but allows for a faster shutter speed. A small aperture (high f/#) gives a large DOF but requires slower shutter speeds.



Point of Focus

Where you choose to focus together with a short depth of field can be used for creative effect too.



Same wide aperture, different point of focus.

Wide aperture settings are used to isolate elements of your scene using blur and focus. The mid range aperture settings of f/8 and f/11 are used when all the elements of the scene are a similar distance from the camera. Aperture settings above f/16 are used when there are elements of your scene close to the camera and far away and you want everything to be in focus.

DOF Preview

When you look through the viewfinder the aperture is completely open. As you release the shutter, the aperture closes to the required setting. Some cameras have a feature called 'Depth of Field Preview'. Check your manual now to see if your camera has it. The DOF preview closes the aperture to the required setting so you can see the apertures creative effect before you release the shutter. Run through the previous exercise above again. This time don't take a picture, just use the DOF preview. Higher f numbers mean a smaller aperture and less light so the scene will become darker especially at f/22 but let your eye adjust and notice how much of the scene is in focus at different settings. The DOF preview is a very useful tool and it will pay off to spend time getting used to using it.

Shutter Speed

We've just seen how aperture can provide a range of creative effects based on depth of field. Our other main method of creative control is the speed of the shutter.

Shutter speed allows us to freeze action or control the degree of blur. Blur can be used to impart a feeling of motion or action or to create an entirely artistic image that bears little resemblance to the same scene shot at a higher shutter speed.



First choose your subject. Choose a scene with a constant movement such as a running faucet or street traffic. If you choose a faucet you'll get a better appreciation for the different effects if the water sprays off something. Careful not to get your camera wet though, digitals aren't very forgiving to moisture. Be careful if you go to the road side, don't get hit by a car, please! Better yet find a bridge to shoot from. Long exposures of traffic are fun in the evening when vehicles have their headlights on. If there's still a little light still in the sky to backlight the skyline, you can get some nice images.

For slow settings you'll need a tripod, beanbag or cushion. I have seen people balance their very expensive cameras on precarious perches. Tripods start at about \$20 and are far cheaper than the repair bill of a dropped camera. Below 1/60s you need a steady hand, below 1/40s you'll need to steady your camera on something.

First a fast shutter experiment. Open your aperture as wide as it will go. Then frame your scene and increase your shutter speed until you get a correct exposure. How fast you shutter needs to be will depend on how fast the action is. Try for above 1/250s. If you have trouble freezing motion try choosing a brighter scene or increase you ISO. Both will allow you to increase you shutter speed.

So with your shutter set at a high speed, your aperture wide open, frame your scene, focus and release the shutter.



1/250s, f/5.6, ISO 800

There is still a little motion blur in this example so the shutter speed could be increased to completely freeze it. Come back to this example later and see if you can work out what you should do to maintain a correct exposure.

Now reduce the shutter speed to 1/60. This is a good speed to hand hold a short lens (less than 85mm) or when using very little optical zoom. It can freeze normal human movement.

Again adjust the aperture until the needle shows a correct exposure. Frame your scene, focus and shoot.



1/60, f/11.0, ISO 800

Set your shutter speed to 1/4s and reduce your ISO to its lowest setting. Slowing your shutter will allow more light in so you'll need to frame your scene and adjust your aperture. Again depending on how much you have to close it depends on how bright your scene is. If you have difficulty getting the needle in the middle of the light meter it's possible you might not be able to adjust your aperture enough to compensate. If you close your aperture as far as it will go, e.g. f/22, and you still can't get a correct exposure then leave the camera at its highest f number and adjust the shutter speed until the exposure is correct. Don't worry if you can't get the shutter speed down very far. We have a few tricks I'll share with you later. For now just set it as slow as you can until you get a correct exposure.

So you've got a slow shutter speed and an aperture setting to compensate. Frame, focus and shoot!



0.8s, f/29.0, ISO 100

Tip:

Always do a last minute check of your light meter before releasing the shutter. It's possible light conditions changed while setting up your camera.



So you've seen what we can do using a few of the settings. Aperture controls the depth of field, while shutter speed controls the amount of blur. Understanding these concepts will allow you to create the kind of photographs you have always wanted.

Putting It All Together

So this is where it gets tricky, I'll type slowly so you can follow. You may need to re-read this next bit a few times so don't be discouraged if you don't get it first time. I had to write it a few times too. If you prefer to learn by example, like me, then press through this section. Read it but don't get discouraged if you find it tough. Take lots of photos and even if they turn out horrible, post them in the forums at www.GoingManual.com. Mistakes are valuable lessons!

Tip:

Post your photos and questions on www.goingmanual.com. Everyone using the M setting on their camera has battled to understand this. No question is too basic and no photo too screwed up! We have all been where you are now.

ISO

ISO changes the sensitivity of the sensor to light. Allowing you to increase or decrease the possible settings. Increasing ISO will increase the likelihood of electronic 'noise' in your pictures. ISO noise is a grainy look to your photos and is a phenomenon of both film and digital. Use the lowest ISO whenever possible, if you have difficulty getting the shutter/aperture settings you want you can increase or decrease the ISO, just remember above ISO 400 will start to produce noticeable noise.

ISO is represented using numbers that double each time to represent the sensitivity to light doubling with each increase.

25, 50, 100, 200, 400, 800, 1600

Tip:

The effect of noise can be reduced in post processing.

Have a look at how to change your ISO in your camera manual or online. Post what you find out online at www.GoingManual.com. Set it to ISO 200, a good general setting that should deal with most situations with no noticeable noise.

Aperture and Shutter Speed Relationship

You've played with aperture and shutter speed and hopefully seen there is a relationship between the two. Understanding this relationship is the real essence of going manual. Aperture and shutter speed can both be changed so to predict how they will interact, we need to have a way of measuring both.

Aperture width is represented using fractions. I hated fractions at school but they're a necessary evil in photography. A completely open aperture would be represented as $f/1$, or a whole number ($1/1=1$) to represent wholly open. You've probably heard the term 'f' numbers. The f is simply the 1 above the fraction. While your camera may have many f settings these are the ones you need to learn.

$f/1, f/1.4, f/2, f/2.8, f/4, f/5.6, f/8, f/11, f/16, f/22, f/32$



Look at them more closely, do you see a pattern?

$f/1, f/1.4, f/2, f/2.8, f/4, f/5.6, f/8, f/11, f/16, f/22, f/32$

Just like ISO there is a pattern to the numbers. Learn the first 2 numbers then you see the sequence doubles from those two.

Shutter speed is measured in seconds or fractions of a second.

4, 2, 1, $1/2, 1/4, 1/8, 1/16, 1/30, 1/60, 1/125, 1/250, 1,500, 1/1000$ etc.

Any number of seconds can be used but these numbers again, are in a sequence, halving (or doubling) each increment. Well almost, the numbers are rounded at $1/30$ (should be $1/32$) and $1/125$ (should be $1/128$) which makes the math a little easier.

It's worth noting the relationship between aperture and focal length. In one lens an $f/8$ maybe be larger or smaller than another of a different focal length. Watch to see how the DOF is affected even with your different lenses even at the same aperture.

Sorry about the next bit, it's even more mathematical.

Stop For a Minute

Have you heard the term 'stop' used in photography and were so confused you did just that? Well you're already halfway to understanding it. It's a tricky concept and unfortunately we're still in the bit you'll probably have to read again. Stick at it as once you get through this, we can get to the fun stuff.

The increments in the previous sequences are called 'stops'. Here's the important bit.

Each increase in one stop will double the amount of light that reaches the sensor. Each decrease in one stop will halve the amount of light.

Here a few examples of what I mean.

Changing the shutter speed from 1/60s to 1/30s halves the shutter speed. It's slower so it lets in more light. If it's half the speed then twice as much light comes through. This is stopping up by one stop, doubling the amount of light using the shutter speed.

Changing 1/30 shutter speed to 1/60 doubles the shutter speed so it halves the amount of light. This is 'stopping down' by one stop, halving the amount of light.

Change 1/30 to 1/125 and you've stopped down the shutter by 2 stops (doubled the shutter speed to 1/60 and doubled again)

Change 1/500 to 1/2000 and again you've stopped down the shutter by 2 stops.

Changing the aperture from f/11 to f/8 makes the aperture wider by one f stop (remember f/1 is wholly open) so more light get in. This is 'stopping up', increasing the aperture by one f stop.

Tip:

You can stop up or down buy changing the shutter speed, aperture, ISO or a combination of all three.

So What?

You frame your scene and adjust the aperture and shutter speed. The light meter's needle is in the right place, indicating a correct exposure. You take your picture but it's not the kind of shot you were after. You might want to change the aperture for creative effect and shorten the depth of field, blurring out the background. Remember to shorten the depth of field we have to widen the aperture. If we make the aperture wider by 2 stops (stop up by 2 stops), we can increase the shutter speed by 2 stops (stop down by 2 stops) and we still have a correct exposure.

Take a moment to grasp this concept it's all about using the camera settings to control how much light gets to the sensor. It will give us the creative control we want.

Let's look at a real life example.

In 'fully auto' your camera produces a blurry image, so you decide to have a go at a manual shot. You review your cameras settings and see it was choosing the auto settings of 1/30 and f11. The problem is 1/30s is too slow to handhold resulting in unwanted blur. We could use a tripod or alternatively, increase the shutter speed. About 1/60s is an OK speed to hand hold at.

What effect will this have on our exposure? Well, we've doubled the shutter speed from 1/30 to 1/60. A faster shutter speed means less light. Twice the speed is half the light reaching the sensor. That's a loss of one stop. We need to stop up the aperture by one stop to compensate and increase the light reaching the sensor.

If 1/30s and f/11 was correct according to the light meter in fully auto, then in manual, 1/60 at f/11 will now read one stop underexposed. To get a correct exposure increase the aperture by one stop from f/11 to f/8.

Now our camera would be set at 1/60 at f/8. The needle in the light meter will be back in the middle and we can now take our photo without getting the 'hand shake' blur. We loose some DOF but the trade off is worth a sharp image.

We have another alternative, which might prove easier for now. Set your camera to Tv, (shutter priority), and use a shutter speed of 1/60s. The camera will then select the best aperture it can based on the available light.

ISO can help us achieve our desired shutter speed or aperture setting. In the previous shutter speed examples of the water running over the stones, the settings for the fast shutter speed was 1/125s, f/5.6 and ISO 800. There is still a little blur in the water but the aperture for that lens is as wide as it will go. If we can't increase the size of the aperture we can increase the sensors sensitivity to light. Changing the ISO from 800 to 1600 doubles the sensitivity of the sensor and so is a one stop increase. This allows us to increase the shutter speed by one stop which will halve the light reaching the sensor.

The result is 1/500s, f/5.6, ISO 1600 which is the same exposure as 1/125s, f/5.6 and ISO 800. Remember though higher ISO means more grainy noise in your image.

The Bulb Setting

A useful application of this knowledge is very long exposures. If your camera has a B or bulb setting you can keep you shutter open as long as you hold the shutter release down, you might need to use a cable release for this to avoid shaking the camera, and of course a tripod or steady surface. Unfortunately the light meter doesn't work on bulb. On my camera I can set the shutter to automatically close after 30 seconds. Beyond that

I have to use the bulb setting to open and close it manually, based on my on timings.

Imagine a low light scene where a high DOF is required for my desired creative effect, where everything is in focus from front to back. We already looked at how to achieve a high DOF, I need a small aperture. But when I try to set my shutter speed I need more than 30 seconds. So I can't get my light meter to show a correct exposure. If I set my shutter speed to it's maximum before the bulb, in my case 30 seconds, I can open up my aperture (and increase my ISO) until the light meter shows a correct exposure.

Say, for example, the light meter says a correct exposure is 30s, f/8, ISO 1600 but I want the maximum DOF I can get at f/22. The light meter won't work above 30 seconds but I can take the data I have and work out my settings.

Shutter speed	F/#	ISO
30s	f/8	1600
60s	f/11	1600
120s	f/16	1600
240s	f/22	1600
Decreasing ISO		
480s	f/22	800
960s	f/22	400
1920s	f/22	200
3840s	f/22	100

All the values in this table result in the *same* exposure.

If I can use my light meter to get a reading, I can use that information to change the set up to the creative settings I want.

Each increase in f/# will halve the light so doubling the time compensates. Each reduction of ISO halves the sensors sensitivity to light, again doubling the time compensates. Unfortunately in digital photography both long exposure and high ISO cause noise. Film users can extend the shutter times without incurring a noise penalty.

Tip:

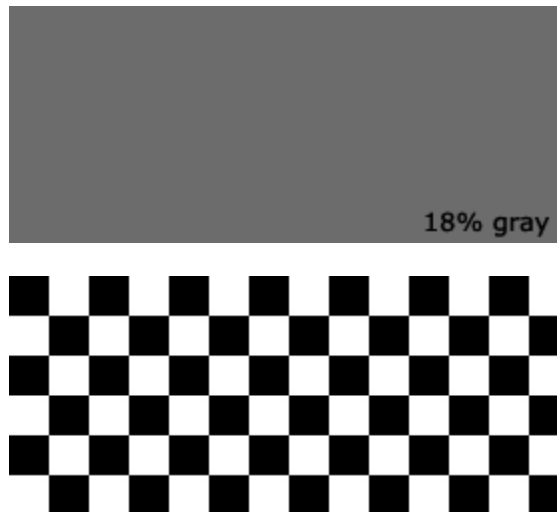
ISO, Aperture and shutter speed all work together to control how much light reaches the sensor. If you increase one you must decrease one or both, of the other two.

So time for a headache tablet and a break. It's not easy to get this, so if you're not understanding it, give it another read. If you're still not clear don't stop, just have a go and post your experiments and questions in the forums at www.GoingManual.com. Post your images, good or bad, and tell the other forum users what you were trying to do. Together we can try to work out the problems.

Metering the Scene

18% of Everything

Your camera's light meter lives in a rather dull, gray world. It believes all light is reflected of every surface by the same amount. The magic number is 18% which represents the middle point between black and white. It can't see color and believes all the world is the same and does its best to take an average of the different levels of light in a scene. Now you could trust your photography to it, but the human eye is capable of so much more. Take control of how you meter, and you control how you make your photographs.



Because the light meter takes an average of tones, it sees the checkered pattern as identical to the gray pattern. The tonal range is different though. The gray image only has one tone whereas the checkered pattern has two. If I replaced 5 white squares and 5 black squares in the checkered pattern with gray, the tonal range would then be three but it would still be balanced and the camera would see it the same as the two images above.

To meter accurately you need to judge if the tonal range in your scene is balanced. This gets easier with practice but fortunately digital users have technology on their side. We'll look at a really useful tool called histograms that can help a lot with after we first have a look at how we can measure light.

If your camera is digital then it has a light meter built in and it's usually a 'Through The Lens' meter or TTL. Some cameras have an external meter built in so check your manual. You don't want to cover that up with a finger. The meter is pretty good at guessing the conditions and setting your camera accordingly. That's why you'll often get an adequate shot even when using the fully or semi auto modes.

The problems come with tricky lighting situations. Sunsets, sand, snow

and other unbalanced contrast scenes are all difficult to get a correct exposure as they don't average at 18%. Snow is very reflective so the meter thinks it needs to tell you (or the camera's brain in auto) to darken the scene for a correct exposure. The result is dull gray snow. The same is true with sand or any light scene. On the other end of the same problem are very dark scenes. Say you wanted to take a picture of black marble. It hardly reflects any light so the meter is fooled into thinking it needs to brighten the scene resulting in overexposure and a grayish color instead of pure black.

We need to know how to interpret the meter to make the necessary adjustments or take a reading off something we know is 18% reflective. A gray card is a professionally produced card that is 18% reflective. You can put the card in your scene and take a reading from it (the reverse is white and can be used to set up white balance). You then have a happy meter that can take a reading based on the ambient light and its required reflectivity.

A handy trick if you don't have a gray card with you is to use the palm of your hand. Handy, get it? sorry..... You'll need to find out how reflective your palm is so find a gray card to borrow. First, in bright light, take a reading off your gray card and adjust the camera for a correct exposure. Without changing any settings, place your palm in front of the camera at the same angle and in the same light as the gray card. Look at the meter and see how it reads. My palm is 2/3 stop more reflective than a gray card. Try the same thing in shadow or other light conditions and the difference should always be the same. Now if the light is tricky and the meter is being fooled, use your palm to meter off. I have to reduce my meter reading by 2/3 stop and I'll have a correct exposure.

With both the gray card and the palm method make sure the angle you hold your hand or card represents the same light as your subject. Don't turn your palm down and meter it in shadow if your subject is in full sunlight and don't reflect the light into the camera, off your palm if your subject isn't reflecting it too.

Using auto or semi auto settings when the scene is difficult to meter will result in an incorrect exposure. You have the options of using the exposure compensation feature of your camera or possibly locking the exposure in an area that is correctly exposed. The method that offers the most control is manual. When you become familiar with using the manual mode you don't have to use any other settings nor are you tied to camera types that use these technologies.

Metering Modes

High end digitals have several metering modes for different occasions. Check your manual to see if it has the following.

Matrix

The camera's brain takes readings from several points in the scene and compares it to different scenarios stored in memory. From this it tries to best guess the meter reading. For general use it works pretty well.

Average

Readings are taken across the scene and an average is taken to guess the correct meter reading. It's easy to fool the meter if the scene has significant and unbalanced contrast between light and dark.

Center Weighted

As the name suggests, the camera takes readings from the center of the scene only. This is a useful tool when manually metering. The center of the viewfinder has to be pointed at the area you want to meter.

Spot or semi-spot

Like center weighted only a much smaller area. You have to be accurate using this mode as it's easy to aim slightly off and get the wrong reading. Useful for metering really difficult scenes.

Matrix metering is fine for most situations especially if you use in conjunction with the technique of filling the viewfinder with the area you are exposing for. For more accurate manual metering use center weighted or spot. But as noted above you have to be careful with spot metering to get it right.

Taking Meter Readings

Taking meter readings and setting your camera manually is key to leaving point and shoot or auto behind. Once you learn where to take the meter reading from, your pictures will be consistently correctly exposed.

So where do you take the meter reading from? Different situations require a different method but there are a few things that remain the same.

Expose For Your Subject

You may find you're in high contrast situation that it's impossible to set the camera to correctly expose the whole scene. That's going to happen sometimes, so you have to do the best you can. Expose for your subject by moving in close or zooming so your subject fills the viewfinder. Don't worry if you loose focus but be careful not to change the amount of light on your subject by casting shadows. Take your reading by looking through the view finder. You should have already decided on the creative aspect of your shot and chosen either your aperture, for DOF, or Shutter speed to stop motion or allow blur. So with your creative setting in place you adjust the other setting to compensate for a correct exposure. Remember ISO can help you get into the range you would like. Now move back and re-compose your scene. Your light meter will probably show you are not correctly exposed, but you know better. You can take your shot knowing the important aspect, the subject, is correctly exposed and hopefully the rest isn't too far off.

Tip:

If there is a really high contrast difference you can choose an exposure that's not quite right for either end of the range and make adjustments in post processing later. Alternatively take several shots of the same scene at different shutter speeds and put the images back together in post processing, using only the correctly exposed areas from each. Don't change the aperture though as this will affect the DOF.

Some common situations

Sunsets and Sunrises

Meter just to the side of the sun. Strong backlighting will produce silhouettes of items in the foreground.

Reflecting Sun

Meter the reflection. This will work for water reflections and also where the sun is reflecting off the ground.

Blue Skies

If the sky is perfectly clear take a reading from the blue sky and it will be accurate for any subject in sunlight.

Night Exposures

Depends on how much light there is in the scene. Meter for the brightest area. You might have to experiment to see how much ambient light in the night sky there is. A slight glow can turn very bright in a long exposure.

Moon

Spot meter the moon and if you want capture its detail, use a fast shutter speed above you might have to go as high as 1/100th. The moon is as bright as a sunny day and is whizzing across the sky! The meter will try to overexpose if you include the night sky when metering due to the large area of black sky that will read under 18% resulting in a bright over exposed moon.

Green Foliage

Meter the foliage and increase the reading 2/3 stop.

Bright or White Scenes

Use a gray card or your palm as the white will fool your meter into underexposing. Alternatively, overexpose a little, according to the meter, and check your histogram comes close to the right hand side.

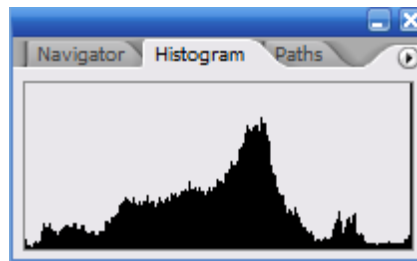
Dark or Black Scenes

Again use a gray card or underexpose, according to the meter, to make sure black stays black.

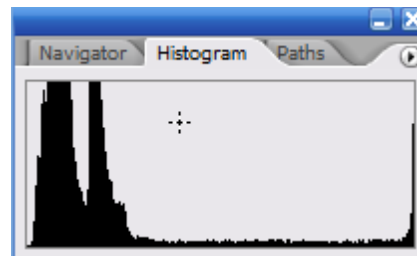
Understanding Your Histogram

The biggest advantage that digital has over film is instant feedback. You can see right away how well exposed your image is. High end digitals have a neat feature that is really useful to understand called a histogram. It's simply a bar graph of the different tonal values in your shot. The camera sees in shades of gray so its brain is interpreting a black and white image.

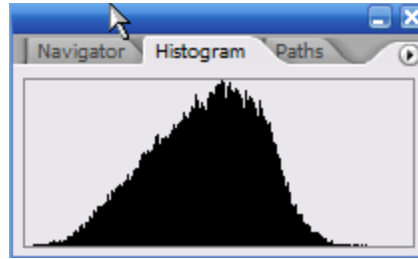
The histogram uses a scale along the bottom of the graph and goes from 0 black on the left to 255 white on the right. The vertical axis is the relative number of pixels in that tonal range. For the purposes of metering, think in shades gray, remember that's what your meter sees. Have a look at a few of the example histograms and see how they relate to their images. None of these have been processed in any way.



This image has a wide tonal range but not many highlights. The orange and green show in the mid tone range.



This image is basically 3 tonal ranges; the yellow building, the dark blue sky and the lights. In the histogram the yellow and blue tones are represented on the left and the highlights are the very thin line on the very right hand side.

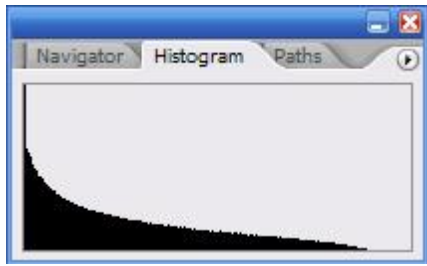


This image hasn't been converted to grayscale. This is the color of the tree and the sandstone head. You can see the tonal range more clearly when the colors are less distracting. The camera sees in grayscale and looks at tones in black, white and shades of gray. Again you can see the lack of highlights in the image are represented in the histogram by the lack of anything on the right hand side.

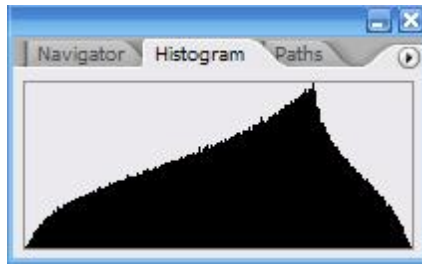
Have a look at the post processing Levels tutorial to see how histogram information can be used to improve an image.

Sometimes your graph will top out. This just means there is a disproportionate amount of pixels in that tonal range to represent on the scale. It's not necessarily a bad thing. If you graph stacks up on the ends that's not so good. If it stacks up on the left it means you have a large area of pure black in your shot. Common with night sky photos and as long as you would expect that kind of thing then it's no problem. If the graph stacks up on the right you've overexposed. Even snow scenes should only just touch the right end of the histogram, any more and the overexposed areas will loose their information and appear too white. This is called blowing out and is a common problem with scenes of high contrast. The highlights will receive too much light and blow out, losing detail.

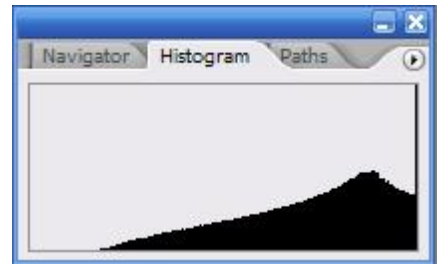
You can use the histogram to great effect in scenes with snow or lots of white, like a wedding dress for example. Your meter will want you to underexpose, (too much above 18%) giving dull, gray whites. By consulting your histogram, after taking a shot, you'll see there are no tonal values on the very right hand side so there are no white pixels. You now know you have to increase your exposure a little and check again to see your histogram just touches the right hand side. This shows you are recording white pixels but not blowing out, by stacking up on the right side.



Lots of black pixels in this image and no highlights. This might sometimes be your intention.



Well exposed. The curve just touches the right hand side.



Stacked up on the right means over exposed blown out areas. We rarely want this.

We'll see histograms again later on, when we come to post process our images.

Flash Metering

A little known fact is most flashes fire twice. They happen so close together that you only see one. What is happening is the flash fires once and the light is reflected back to the camera. The camera measures the amount of that light and calculates how powerful the second flash needs to be. Then the shutter opens and the second flash fires.

This is useful to us if your camera allows you to fire your first flash manually. A problem flash can have is the first flash can be fooled in the same way your light meter can be fooled and give an overly powerful second flash. This is often seen in flash pictures at night where the face of the subject is overly lit. You can choose to zoom in on your subject, fire the first flash manually re-compose your scene and take your picture. The flash will only fire once and its power will be based on how you chose to set it. Consult your camera's manual to see if your camera has this function or look online.

You can purchase a hand held flash meter that measures the power of the flash at your subject. The power of external flash units, that attach to your hot shoe, can be set manually giving you greater control. The meters are expensive and take a lot of practice to master are beyond the scope of this book. Post a question on GoingManual.com if you'd like to learn more.

Composition

*"There are no rules for good photographs,
there are only good photographs."
~Ansel Adams*

How a photo is composed depends on your subject and how you hope to capture it. Photography is a form of art so while we will discuss various rules to help never be afraid to try something your own way. Try to find your own vision and express what you see.

Composition is affected sometimes by the slightest change in viewpoint. A few inches to the left or right can make the difference between a disappointing shot and what you hoped to achieve. Look through the viewfinder and try different positions before taking your picture. Watch how the changing view points affect the composition.

Tip:

When you find a scene worth shooting, stop. Don't get your camera out right away. Sit and look at it for a few minutes and consider what is that had captured your interest. Break it down into elements and then decide how best to compose those elements. Give your subject the time it deserves.

Lead In The Eye

Let your viewer's eye be led into the image. There are many ways to do this; with foreground, mid and background, depth of field or elements of the composition such as roads, rivers or fence lines etc.



The image on the left uses a short DOF to keep only one flower in focus. There is also a curve to the layout of the flowers that helps to draw the eye up and through the image. The rice field photo on the right has an interesting curved shaped, that again draws your eye up to the traditional Japanese farmers house.

Point of Focus

Leading your eye into a strong point of focus or main subject can produce striking results too. Avoid having too many elements to your picture as the clutter will detract from the photos impact. Backgrounds that appear cluttered are often referred to as noisy, likening the effect to that of a buzz on a sound recording. If you do include other items in your composition, make sure they compliment the subject rather than detract from it.

Fill the Frame

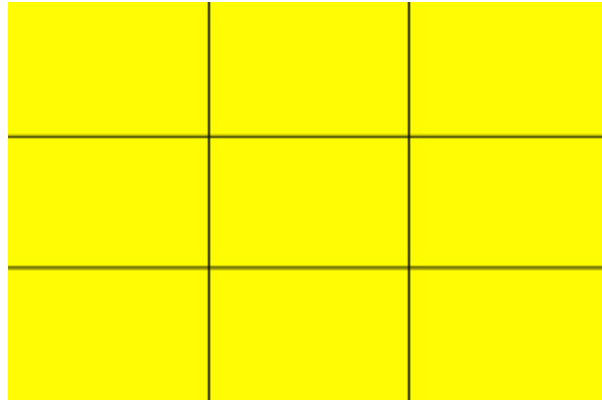
Solve a tricky composition problem and concentrate the scene on the subject.



The man on the right is cooking in a messy kitchen that added little merit to the photo. I was interested in the tattoos on his back so, with his permission, moved in closer to remove the distracting elements.

The Rule of Thirds

The Rule of Thirds is a classic way of improving your composition. In the previous images of the white flowers and rice field, both the in-focus flower and the little blue house are positioned on the Rule of Thirds. Images where the subject is dead center usually lack interest and moving the subject off to one side or up or down can help. The Rule of Thirds will help you with how far to move your horizon or point of focus. Imagine the scene split into 3 sections both horizontally and vertically. Where the lines cross is a compositionally good place to place your point of focus. The horizontal lines are good places to position horizons and the vertical lines can work for other points of interest.



Both the rice farmers, the tree line and the sky's reflection are all close to the Rule of Thirds. The angle of the rice field draws your eye up through the image, creating a sense of the vastness of their task.

Moving Subjects

If a subject is moving leave room for them to move into. Sounds a bit weird but without it your brain will feel the subject is about to run off the edge.



In this image in a Tokyo subway, the woman has plenty of space to walk into and is positioned using the Rule of Thirds. The lines of perspective leads your eye through the image and the dark plain clothing contrasts well with the noisy background. If the subjects clothing had been bright or heavily patterned, this image would not have worked at all.

If you see a background you think is interesting then stop and wait. Almost always within a few minutes something will come past to make the best of it.

Print and Frame Sizes

35mm camera sensor have a height to width ratio of 3:2 so to print the whole image as it was taken you must use a size such as 4"x6", 8"x12", 10"x15, 20"x30" etc.

However the most popular size frame is 8"x10", a ratio of 4:5 very similar to another popular print size of 11"x14".



3:2 ratio
6x4, 8x12, 10x15



4:5 Ratio
8x10, 16x20



A popular size is
11x14
Very similar to 4:5

This causes a problem when you want to print; you'll have to crop or add a border to preserve the original image. You can chose to print all your pictures with the same 3:2 ratio or consider the frame size of the final picture when you shoot. Don't crop too tightly and leave extra space around your subject to account for the different ratio. Practice cropping your pictures on your PC to different ratios to better understand how to shoot in future. See the Cropping tutorial in the post processing section for more information.

Different Styles

Learn by Doing

From here on you will learn by practicing. All the reading in the world won't make up for experience. One of the most useful tools in improving at photography is getting and giving critique. Take your pictures and post them in the forums at www.GoingManual.com. There is a forum for each section below. While you're waiting for a critique of your image, write a critique of someone else's, even if you're not sure what to say. You will learn a lot, even if everyone disagrees with you. Sometimes you learn by being wrong and sometimes you might be the only one who is right! Art is open to interpretation and beauty is in the eye of the beholder.

Giving and Getting Critique

Never take offense to critique. Sometimes it can hurt to hear less than positive comments about an image we really like. However, we learn nothing if all we hear is flattery. Every opinion is valid if it is completely opposed to your own.

Please consider these guidelines when giving critique.

- 'Nice shot!' Isn't useful critique. While it's nice to hear positive comments, we're here to learn. Analyse the photo and try to express what is it that works and why you like it.
- 'Does nothing for me' again isn't useful critique. Just like positive comments simple negative comments are not going to help anyone. They are often very hurtful so back up any negative comments with reasons. Repeated simple negative comments will not be tolerated in the forums.
- Every picture has something good about it, so if you feel the image needs negative critique look for the positive and give a balanced review.
- Look for posts that have not received a critique. This is often because the critique is difficult to give or might be mostly negative. These posts provide the greatest learning opportunity for both the original poster and the person giving critique. Look, think, post and learn.
- Consider your response before posting a reply to something you think is offensive. There is no tone of voice on the internet and sarcasm is easy to miss. If you're joking, use smileys (emoticons) to make sure your intention is understood.
- There are general rules for the forum that must be followed. Offenders will be warned. Repeated offenders will be banned.
- The object of the forums is to provide a healthy learning environment so please bear this in mind when giving or reading critiques.

Portraits

Whether in your own home, a studio or on location, you can make great portraits of your friends and family, even your pets. Just remember the basic rules of composition and try to set up a scene in your house that's not too cluttered. Natural light is best used near a large window but avoid direct sunlight as it will produce very high contrast images, with a big difference between the light and the shadows. If you have to use a flash to fill in some of the shadows, lessening the contrast. Be careful not to cast a harsh flash shadow on nearby walls. A useful addition to a flash is a diffuser, a translucent plastic hood to soften the light. Tape and tissue paper make do pretty well in an emergency. No, not that kind of emergency, the photographic, harsh flash shadow, kind of emergency.

Don't forget to use a reflector if you need to instead of a flash. It will fill shadows with ambient light, without any of the issues caused by a flash. An assistant is really handy to position it correctly. If you don't have an assistant, ask your subject to hold the reflector while you take your readings. Put your camera on a tripod and hold the reflector yourself. Trigger the shutter with a remote release or the timer. Take a picture of the background from the same position. That way if you accidentally include the reflector in the edge of the image, you can copy and paste the background to cover it up.

Try not to kill all the shadows, they help to create a 3D effect. When there's no shadows the face appears very flat.

Tip: Zoom in or move closer and take your meter reading from your subjects skin tones and set up your camera before moving back and re-composing your scene. Remember though very light or very dark skin tones will throw off your meter.

Wide angle lenses do not flatter the human face. Lenses above 75mm (just over 1x zoom) are best as they don't create any wide angle distortion. When depth of field is short, you can create great effects. Focus on the eyes or use a slightly longer DOF to allow the whole head to be in focus, while leaving the background blurry. Experiment with your aperture settings and how far away you position your subject relative to your camera and the background.

Here's an example of 3 different focal lengths, you can clearly see the 18mm is not a flattering lens for facial portraits.



18mm



50mm



100mm

However, wide angle lenses can be used for great creative effect, you just have to be aware of when to use them and when not to.



This shot is also with an 18mm lens



Both these pictures were taken with artificial side lighting. One was converted to black and white using the channel mixer, while the other has a 'cross process' (or X-process) effect applied in post processing. Cross process effects can be downloaded from the net while the channel mixer is part of both Photoshop and The Gimp.

Tip: For a 35mm camera using a focal length of 135mm position the camera about 7 feet from the subject to fill the frame.

If your subject turns their head to one side, focus on the eye nearest the camera. Also try to remain on eye level with your subject. This might mean getting down low when shooting children. Not too low though, shooting from a low an angle gives your subject the appearance of looking down their nose at you (good if you want to produce an image of authority) and might introduce an unflattering double chin. If you look down on your subject they appear more timid. Great for dogs or when you're going for a cute look.

Eyes can be straight into the camera, giving a more intimate feel, or looking to one side into the distance to give that 'faraway' look.

To avoid **red eye** use an off camera flash or an external flash on a bracket. The red is caused by light reflecting off the back of the eye ball so increasing the distance from flash to lens reduces the occurrence of red eye. Personally I don't like the red eye reduction flashes on some cameras, they don't work very well and increase the time between hitting the shutter release and capturing your subject. If you can, try bouncing you flash off a wall. You can redirect on camera flash using a piece of foil. Or diffusing the flash with tissue paper.

If you can use external lighting, don't have it shining directly from above as it produces unflattering shadows. Watch for these when bouncing the flash off the ceiling.

Tip: Set up your camera using a tripod. Frame your model and set up your lighting then move out from behind the camera. Have them tell you a few stories about themselves. You can capture the emotion using a cable release and your model will feel less on display.

Post your portrait images for critique here

<http://www.goingmanual.com/photo/board/viewforum.php?f=7>

Groups

From family get togethers to large wedding parties, posing groups artistically can be a challenge. First you have to take control. People will mill about aimlessly waiting for direction and it's up to you to provide it. If you encounter problems explain to the trouble makers why you're taking the pictures. They might be very important to Aunt Betty, or it might be the first time in 20 years all the siblings have been together. There's usually a good reason to get a group photo organized. Getting stressed at people because they continue to mess about will spoil your rapport with your subjects. Use their energy, take a few close up photos of the pranksters and let them get it out of their systems. They are the most likely to say or do something funny when the group is assembled. Be ready as it will give a genuine smile on everyone's faces.

Tip:

Be ready to capture natural expressions. People almost always laugh very naturally immediately before and after the official shot.



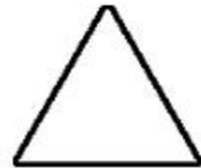
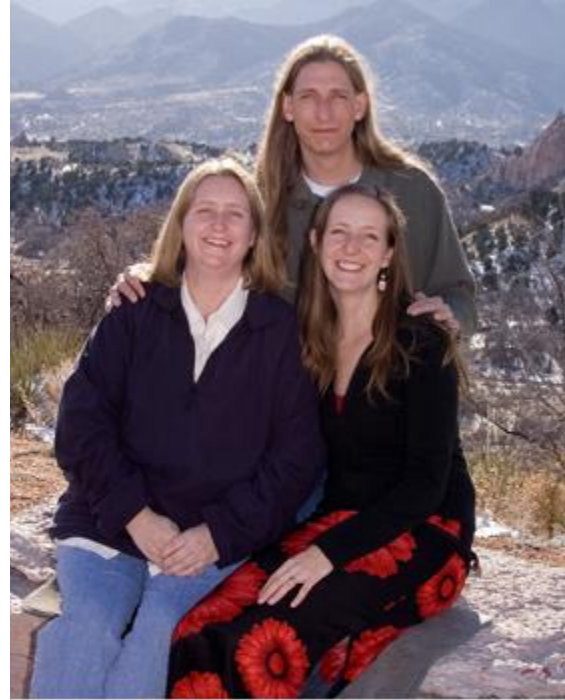
This shot was the least formal and the favorite of all the people involved.

Your confidence will come with the knowledge that you can artistically pose any size of group. The answer again lies in mathematics, fortunately no fractions this time, now we're going to use geometry and symmetry.

Look at the number of people and think of a shape that will incorporate everyone while still maintaining good composition. For 3 people a triangle is one choice, for four people maybe a diamond. Both can be arranged using a chair to lower one person, usually the most important, one on either side and the tallest behind. This very simple theory will work with any size group. Sit children at the front and let mom come and sit with them

if they become upset or restless. If the group gets really big try a higher angle. Use a step ladder to get up high and pose the group in a circle.

Use levels; standing, sitting, and kneeling or sitting on the floor. Use colors to represent shapes or patterns especially useful at formal functions where men typically wear dark mono suits and women wear brighter colors.



If you choose to line people up, try to keep heights symmetrical or line up men on one side and women on the other. Turn outer shoulders forward so people slightly face the center. This helps to avoid the 'sports team' photo look which only really works for, well, sports teams!

Have a few fun ideas ready to get a group laugh. Ask for superhero poses, or a catalog model pose. People pointing, frozen fake laughing and pouting lips everywhere. How about this line, "if you want this picture to look really good I can come and stand in the middle", I know it's not funny, it's cheesy but everyone will laugh. It helps people relax and get those beautiful genuine smiles. Have everyone raise their hands in the air and shout your name like a pop star. You'll be surprised how often groups will do anything you tell them. Give them the opportunity to relax!

Post your group images for critiques here

<http://www.goingmanual.com/photo/board/viewforum.php?f=8>

Children

So you like a challenge? Children can be the most rewarding and the most challenging subjects. Babies aren't the hardest subjects as once they see you pose no harm, mum can usually get a smile with a few peek-a-boos. Watch a baby as it falls asleep, they usually smile as they drift off.



Generally kids up to 8 years pretend to be shy, but very few are. In fact the more shy they appear initially, the more of a handful they turn out to be. The biggest mistake adults make when they meet kids for the first time is want to be liked and they try too hard. Say hi when you first meet them and keep talking to the adults and taking the adults picture, or at least pretending to. The kids will see the adults are comfortable with you and so assume you're harmless. They will begin to show interest and start to demand your attention. Don't give them too much or they start to show off and get unruly. Crouch down to their level and ask them their names and ages and a few questions to show you care about what they have to say. What are their favorite toys, who is their best friend, what is their teacher at kindergarten like. Have your camera nearby or in your hand but don't use it until you begin to feel a rapport. If the kids are small then sit down on the floor with them. Show them pictures of mommy on the LCD screen and snap a quick shot of them to look at. The biggest issue with children is the attention span. If they become fascinated with your camera and want to play with it, use your knowledge gained from your initial chat to use their favorite toy as a distraction. If they begin to get naughty tell them you'll have to tell mommy or their kindergarten teacher. Kids love role play games with their toys. Using a stuffed toy or two and a funny voice will go a long way but only if you get into the character. Kids can spot a faker a mile off and like sharks, they can sense fear! Post your children images for critique here <http://www.goingmanual.com/photo/board/viewforum.php?f=28>

Shooting Outdoors

Shooting outdoors has several advantages including natural light and a variety of backdrops. Every town has its beauty spots and even your back yard or local park can provide an improvement on fake indoor backdrops. Look for simple uncluttered areas to use behind your subject that do not compete for the viewer's attention or recognized local or famous landmarks.

If possible avoid overhead sunshine in the middle of the day due to the unflattering shadows and harsh quality of light. If you have no alternative but to shoot at high noon then use a fill flash or a reflector to reduce some of the shadows. If you can, find natural shade, say of a tree, then your subject's won't need to squint and the lighting will be more even. Watch out for the difference between the amount of light in the shade and a brightly light background.



This picture was taken at noon with sun slightly behind the subjects. A fairly powerful external flash was used to fill the shadows.

Tip: Shooting early morning and late evening provides a nice quality of light. The side angle is flattering and the reddish tones add warmth. When shooting people use a reflector or fill flash to fill the shadows.

If you can't find shade turn your subject away from the sun and use a flash. You might need a more powerful flash than your on camera flash can provide to use this technique. You have to be careful when metering a scene like this. Make sure you don't let the backlight fool the meter into underexposing your subject. Careful too when reviewing

your images on your LCD screen in bright sunlight, they often look too dark. Your histogram can be useful here to be sure you're exposing correctly.

If you're interested in taking wildlife photos a good place to start learning is a hunting guide. You can find out how to stalk and how to use a hide. The only difference of course is after you shoot, the animal lives to be shot again!

For flower and other fauna photos just use the same techniques already mentioned uncluttered backgrounds, strong point of focus etc.

Post your outdoor images for critique here

<http://www.goingmanual.com/photo/board/viewforum.php?f=29>

Silhouettes

Backlighting, lighting coming from behind your subject, is a great opportunity to shoot silhouettes. Meter the backlight and if it's bright enough your subject will be so underexposed it will show as a silhouette.



In this shot I took my meter reading from the area of the sky next to the sun. I was careful not to include the sun in the scene when taking the meter reading. With the camera set to manual I chose a wide aperture to throw the background out of focus and used a high shutter to compensate for the bright scene. I recomposed, focused on the spider and took the shot.

Post your silhouette images for critique here

<http://www.goingmanual.com/photo/board/viewforum.php?f=30>

Macro

Getting up close is called macro photography, and is a whole new world of detail around us. It helps to have a special macro lens for this kind of photography but just zooming into to everyday objects can reveal patterns and views you may have never paid attention to before. From insects to electronics the possibilities are endless. All the usual rules and settings apply just remember where before your landscape scene might have been 50 miles now your macro landscape may be 5 inches. Consider you depth of field before shooting and for crisp images use a tripod.



This image of a tiny frog on a lotus leaf follows the rule of thirds and uses both the curves in the leaf and DOF to draw the viewers eye into the picture.

Post your macro images for critique here

<http://www.goingmanual.com/photo/board/viewforum.php?f=14>

Products

The style of image you see in catalogs or online can be shot in the comfort of your own home.



You can make a tiny studio, called a Soft Box, scaled to your products and achieve professional looking results. A Soft Box is a box with an open front and side and top made of translucent material and lighting for the outside. You can buy a purpose built soft box or you can easily make one yourself from parts available from any hardware store. The simplest method is to turn a small table upside down drape a white sheet over the upturned legs, leaving the front open, and position table lamps either side and above. Another cheap method of making a soft box is to buy some PVC piping and connectors from a hardware store and construct the framework. Drape over or sew a white sheet to fit and position your lights.

You must be careful not to leave lamps on close to the sheet as it is a major fire hazard.

Inside the box use a curved piece of paper as a backdrop to go all the way from the front, across the base and up the back in a single curve. Choose a few different colors to compliment your products.

Just like using a home made reflector white may not be pure white and the sheet may impart a slight tint. Certainly the lights will, so you'll need to set up your white balance or correct it in post processing. Have a look at the White Balance tutorial in the post processing section to learn more.

Post your product image for critique here

<http://www.goingmanual.com/photo/board/viewforum.php?f=15>

Landscapes

Landscapes, cityscapes and seascapes are a favorite of all photographers. Large DOF (high f number) and the composition rule of foreground, mid-ground and background will get you going. Look to use elements of composition to frame your subjects, such as overhanging tree branches.



In this picture the fall colors both frame the mountain and lead the eye in from the foreground. It's actually 5 pictures stitched together in post processing. A polarizer was used to bring out the color of the leaves.

Polarizers work best at 90 degrees to the direction of light. As I rotated to photograph the whole panorama the angle of the polarizer lens changed in relation to the sun. Notice the effect this has on the blue sky. In reality it was, of course, the same across the whole scene. They can often make a huge difference to the quality of color in a scene by reducing glare and only take a couple of minutes to fit so worth experimenting with. I don't leave home without mine.

Post your landscape images for critique here

<http://www.goingmanual.com/photo/board/viewforum.php?f=12>

Sports and Action

High shutter speeds are key to freezing action. The trade off is wider apertures and a shorter depth of field. Normal human movement is frozen at 1/60s but sports action can start at 1/250 and go much higher.

Check your camera for the different drive settings. On a DSLR you will have a drive setting that will take multiple frames if you hold down the shutter release. Any less than 5 frames per second and you run the risk of the camera firing just before and just after the best shot. In that case be ready to capture the action when it happens using the single shot mode.

If the action is moving towards or away from you continuous auto focus is a useful feature. It will track a moving object and keep it in focus.

Post your sports and action (including panning and flash) images for critique here <http://www.goingmanual.com/photo/board/viewforum.php?f=11>

Panning

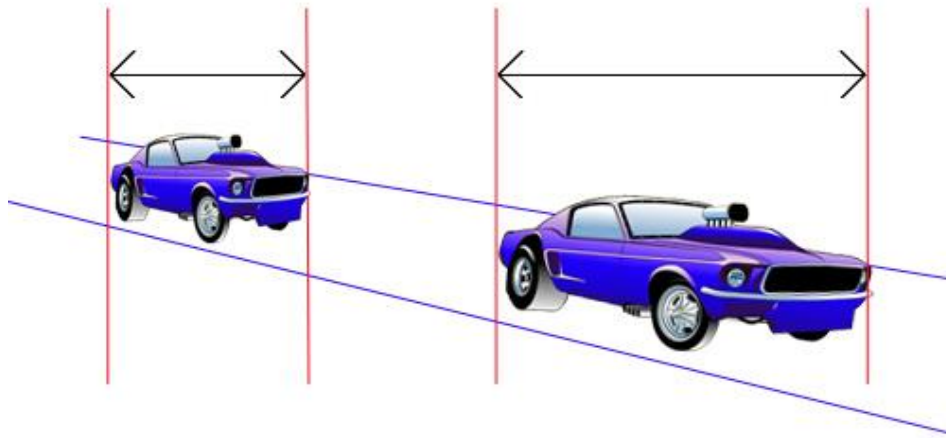
Panning is a useful technique in action shots if the action is in a straight line. Sharp subjects and blurred backgrounds are possible using a longer shutter speed. Settings depend on the speed of your action and how close you are but 1/30 sec should be a starting point for fast action like racing, 1/8 for slower movement. A monopod can help as it allows easy side to side movement while keeping the horizontal plain level.



This image used a 1/4 second exposure and used 'rear sync' flash to light the temple stone. My exposure was a little off but I was able to compensate in post processing.

Metering can be difficult as you might not have a chance to determine how your subject will be lit as it comes past. You might be able to get away with using a gray card or your palm if your subject will be in the same light, but please, don't stand in the middle of a road taking light readings. Remember if your subject is very light or dark and you're using auto settings it will not expose correctly and you won't know until it has passed.

Panning requires lots of practice. On an SRL the mirror swings out of the way to expose the sensor, so you can't see anything during your pan. To increase your success rate find a viewpoint where the moving object is passing you, not approaching, your auto focus wont have to work as hard. If the moving object is approaching, it's not possible to get the whole subject in focus. The reason is, its apparent length changes, as shown below, and stretches causing blur. If you choose one spot on the moving object you can keep it in focus but not the rest. The best you can hope for is to have one area in focus. Notice the effect on the taxi in the picture above.



The car appears to get longer as it approaches causing blur.

Stand in the position where you'll be when the shutter closes and twist at the hip to the start of your pan. Look through the viewfinder and practice your movement a few times until you feel you are fluid, before firing the shutter. You can practice on a busy street with not only cars, but people too.

Rear Sync Flash

This is great for producing motion trails. The shutter is set too slow to freeze the action so there is some blurring producing a motion trail; as the shutter closes the flash fires, freezing the movement. By default the camera will not be set on the rear sync so have a look in your manual or look online to see how it is changed. You'll notice the flash fires before the shutter opens as well as before it closes. This first flash is to determine how powerful the second flash needs to be. This technique is great for live bands too, if you can get right up next to the musicians, or for close up sports action.

High Speed Flash

TO get the timing between of the flash and the shutter speed in sync the speed is often limited to less than 1/500. If you can fire your flash manually (most external flashes can)

Abstract

While not everyone's cup of tea, abstract can turn a boring everyday subject into something far more interesting. It's an alternative to consider when you can't frame the subject as you would like. Moving the camera with the shutter open can produce dramatic results sometimes. While it can be 'hit and miss', experiments with digital don't cost anything, so go see how creative you can be. Use blur or zoom in to explore the patterns in your subject.



Getting up close and moving the camera in circles with a long shutter speed, produced a unique view of the city hall Christmas lights.

Post your abstract images for critique here

<http://www.goingmanual.com/photo/board/viewforum.php?f=31>

Long Exposures

A tripod is essential for sharp long exposures. How long is long? Although not a defined, specific measurement, below 1/60s is difficult to handhold and below 1/40 almost impossible for most mortals, so you could say from there onwards and is open ended. If the exposure time is increased for creative effect or to allow enough light to the sensor because it's too dark, it's a long exposure.



This image was taken hand held from the back of a moving Tuk-Tuk in Bangkok, Thailand.

Post your long exposure images for critique here

<http://goingmanual.com/photo/board/viewforum.php?f=10>

Black and White Images

With digital we don't have the choice of loading in a roll of black and white film. All our black and white images have to be created in post processing.

Why convert an image to black and white? It's the original form of photography so imparts a classic feel to your work. It creates an artistic feel and, without color, the simplicity of shade and lines create the image, providing a view our eyes only see in moonlight. Shadows help to bring out form and texture so experiment with lighting angles and positions.



Black and white is also an option when color is either lacking or detracts from the impact of the image. A distracting, overly colorful background is gone with a black and white conversion or an overcast or cloudy sky no longer detracts from an image but can in many cases, improve it.

Tip: Watch for how sunlight light moves across your subject, In natural light the difference of a few minutes can change the appearance dramatically.

Have a look at the 'Converting to Black and White' and 'Converting to Sepia Tone' tutorials to learn how.

Post your black and white or sepia images for critique here
<http://goingmanual.com/photo/board/viewforum.php?f=9>

Other Forums

There's are also a forum for images that don't fit into any of the above categories called 'General', artistic nudes go in '18+' and digitally altered images in 'Digital Art'. More forums can be added if you think it's necessary, just contact me using the 'Site News, issues and suggestions' forum here.

<http://goingmanual.com/photo/board/viewforum.php?f=23>

A few Other Useful Things

Blown Out Skies

You'll come across lots of situations where it's really difficult to get the kind of shot you want. One solution is **bracketing**, the process of intentionally underexposing and overexposing by a small amount in the hope any slight errors are covered by at least one of your photos.

Often when shooting landscapes you'll frame your scene and end up with a white sky or a dark underexposed foreground.

That kind of shot is always going to be tricky. The meter is taking an average of the scene and putting an emphasis on the bright sky or the dark trees in the foreground. Sometimes the difference in the amount of light is just too big to record it the entire tonal range. You've got a few options.

If you're hand holding, turn the dial to Tv, (shutter priority) and set the shutter speed to 1/60s. The camera will auto select the best aperture. Read in your manual how to adjust the exposure compensation. If the sky is blowing out then turn the exposure compensation down; it will underexpose slightly and find a happier medium than fully auto.

In Manual, point the camera so the foreground fills the frame and adjust the camera to show a correct exposure. Then do the same for the sky and note how many stops different the two areas in your scene are.

For example let's say there is a 3 stop difference. You can use a filter called a Graduated Neutral Density (ND grad) filter. You're supposed to buy a flashy holder and kit for it but for short exposure times you can get away with just buying the glass and holding it in front of the lens. A graduated ND filter will block some of the light without tinting the shot. Its strength changes across the filter so it blocks more light on one half of the filter than the other. You can put the half that blocks a lot of light over the bright area in your scene and the half that blocks very little light over the other half. The filter will help to reduce the difference in amount of light.

The difference is measured in stops so a 3 stop graduated ND filter has one half with no light reduction and the other side reduces light by 3 stops. The line between the two

halves can be abrupt or very graduated.

In our example we can use a 3 stop graduated ND filter to balance the difference in camera settings. Reducing the bright sky and leaving the foreground unchanged so using the settings for the foreground we can take our picture without blowing out the skies. You'll see this kind of image used to great effect with sunsets too.

See, if you hadn't spent the time to learn about stops, you'd have no idea what I'm talking about.

The final option is multiple exposures and some computer time post processing. Ideally, for this method, you should be shooting in manual using the same aperture setting and using a tripod. If you're not going fully manual, you'll need to find the exposure lock on the camera. Frame the sky through the viewfinder and hit the exposure lock or set your aperture and shutter speed. Re-compose your scene and take picture one.

Now take another shot straight at your scene with out any compensation or lock. In manual adjust your shutter speed.

Third, frame the foreground in the viewfinder and in semi auto, hit the exposure lock. In manual mode decrease the shutter speed until you have a correct exposure for the foreground. Don't adjust the aperture as that will change the DOF. Recompose and shoot.

You should end up with 3 versions of the same scene. In the first the sky will look good, in the second you'll have a little of both and not enough of either. In the third your foreground will look good.

The advantage to going manual here is you can take your meter reading compose your shot then adjust the shutter with out moving the camera. Using the exposure lock method, it's difficult to frame the exact same scene every time.

Using your favorite graphics editor open all 3 pictures. You'll need a program that uses layers. Adobe Photoshop or The Gimp are both suitable for this. Have a look at the tutorial 'Blending Multiple Images' in the post processing section to learn how to proceed. This technique can be used for any scene where it's difficult to

Neutral Density Filters

We looked at graduated ND filters when talking about blown out skies. Non graduated neutral density (ND) filters, reduce the light coming through the lens without adding a color tint. They don't require a fancy holding system as they screw onto the front, are cheap and will be one of your most used top 2 filters! Your lens will be marked with the size you need to buy and is measured in millimeters.

You may want to add a blur to your image for creative effect for motion effects or for to give water that milky look at a waterfall. So you turn down your ISO as low as it will go and close your aperture to the highest f number. It possible the meter still indicates a shutter speed too high to produce the kind of blur you wanted. If you add an ND2 filter you'll be able to go 2 stops slower. You have a choice of a range of ND filters but they usually come in 2, 4 and 6 stops.



Polarizing Filters

The previous waterfall image was taken using both an ND filter and a polarizing filter. The polarizer takes the glare off the rocks and the reflection off the surface of the water. This type of picture is best taken when the sky is overcast giving a nice soft light. The polarizing filter rotates. In one position, it will have no effect but rotate it 90 degrees and the light from all angles but one is blocked. So in this picture the light coming from below is blocked by the polarizer. This type of filter is also used to give rich dark blue to skies.

Beware of cheap polarizers though they can affect the auto-focus so if you're having trouble obtaining a sharp focus, switch to manual focus instead.

Tip: if you want a people free photo in a busy place try adding two ND6 filters and adjust so your exposure is very long. People passing will blur so much they disappear.

Electronic Noise

One of the drawbacks to a DSLR is electronic noise. When the sensor is activated for a long period of time a grainy effect is recorded, sometimes along with 'hot pixels' (individual overexposed pixels), the longer the exposure, the worse the noise. There are programs and processes that can help to reduce the effect but none are perfect. High ISO will also cause noise but will reduce your exposure times. For a long exposure I try to use the lowest ISO I can, typically 100 or 200, while keeping the exposure times down to a minimum. With long exposures changing ISO can make a big difference. For example a ten minute exposure at ISO 100, is only 5 minutes at ISO 200. Another trick is to take multiple exposures and put them together in post processing. Have a look at the 'Reducing Noise' tutorial in the post processing section to learn more.

Some cameras have an in camera noise reduction setting. This will try to remove the noise immediately after taking the picture. The process typically takes as long as the exposure.

You're Half Way There!

OK you're much further than half way, but there is still more to learn if you want to be able to present your images to the best of their ability.

So we've looked at different equipment, how cameras use aperture and shutter speed, how ISO can help us achieve our desired creative effect, how to compose and different aspect of everyday photographic opportunities. Now we have our digital photos, we need to run them through the digital darkroom to develop them into all they can be.

There are two sets of tutorials one for The GIMP (General Image manipulation Program) and another for Photoshop. Both sets of tutorials will produce the same results for your images. While Photoshop has more possibilities for advanced techniques both are very capable of developing your images and preparing them for print.

I know there is even more tips and help I could include in this guide but let's leave that for another time. If you read and understood all so far you should now have a very good grounding in manual photography. It's up to you on keep building on it and learn even more.

Teaching is a great way to consolidate your learning, so share what you now understand with those still struggling over at GoingManual.com.

Now on to the digital darkroom!

Part III The Digital darkroom

One of the greatest advantages of going digital is the ability to retouch and enhance your own prints, giving you back control over your pictures.

Many different software packages are available today ranging from free to hundreds of dollars. My favorite two are the industry standard and the leader in open source.

Adobe Photoshop is the market leader and the industry standard in image editing. It will do everything you want and a ton more. At around \$600 it's not cheap but it's the best there is, (only available for Windows and Mac users). Adobe Elements is Photoshop's little brother and will handle most of your image manipulation requirements at a reduced price tag of around \$100. Many of the features in Elements have been locked out but there are services that will unlock some of the more useful features.

Edit: Photoshop CS2 is now available for considerably less due to the release of CS3

My personal choice for number 2 is a free, yes free, program curiously called 'The Gimp' (General (or GNU) Image Manipulation Program). Don't be fooled by the silly name or the price tag, this is a very powerful image editor. The origins of this program are in the open source world where software is made by independent collaboration and licensed under GPL (General Public License). The layout is very different to Photoshop making the transition from one to the other tricky. The tutorials later are easy to follow and cover most of the main image adjustments you'll need to do. It's not Photoshop but having used image editors for some time, it's the only other program I recommend. There is a version that's been hacked to resemble Photoshop, creating Gimpshop. Unfortunately it's less stable than The Gimp and tends to crash a lot.

The Gimp is available here as a free download from www.gimp.org

Make sure you download the right one for your operating system.

<http://www.gimp.org/windows/>
<http://www.gimp.org/macintosh>
<http://www.gimp.org/unix>

You may have your preference to another program and if you're happy and understand how it works, then stick with it. Lot's of tutorials exist on the internet and I suggest using your favorite search engine to find and go through a few. Post your own tutorials online for other users to try. You can post a review on your most or least favorite software too.

We'll look at preparing an image for print later but manipulating images could be a series of books all in itself!

Tip: Open source does not mean lower quality. For a List of free software that is often every bit as good, and often better, than commercial software, have a look here <http://www.opensourcelist.org>.

Computer Hardware

Your hardware requirements are variable depending on what you want to use your PC for. I have used a PIII, 500Mhz, 256 MB RAM that I paid \$50 for and it was fine at processing my 8Mp files. To make life faster and more crash free, I would recommend a processor of at least 1Ghz and as much RAM as you can afford. 1GB of RAM should be a minimum to consider if you don't want your PC to freeze up when stitching a large file panorama back together. Consider a DVD burner for backing up files or an external hard drive. At the very least a CD burner is a must storing back ups. Video cards can be quite low end as you're only dealing in 2D images. Monitors are cheap these days. CRT offer better color representation but LCDs are more space efficient and gaining popularity. If you want a neat system consider a second monitor (with a second video card or a double monitor video card). You can keep your workspace in one monitor and use the other to store your image editing tools and other programs.

Tip: Computers are not reliable. Back up you digital images on to CD, DVD, online or an external hard drive. Store back ups in another location in case of fire or theft.

Edit: While finishing writing this book the hard drive in my external case died and is going to be very difficult to recover. I'm sure I can pay a hefty fee to retrieve the data or struggle and learn to do it myself. Fortunately most of my photos are backed up so it's not a total disaster. However I had procrastinated about backing up my most recent files and have lost a couple of my favorite recent pictures.

Please learn from my mistake. This is now my new work flow.

Take pictures -> Download to hard drive -> Back up -> Edit

I've also found this list of data recovery tools that might work if you find yourself in a similar situation. <http://www.freebyte.com/filediskutils/>

Edit#2: I've recovered the data using PhotoRec (part of TestDisk), available on the above link, but it will take hours to sift through as the original file structure and names are gone. It took approximately 5 days for the program to run. At east I have it back and I've learned something, back up first!!

Card Reader

You'll need a memory card reader to get the images off your camera. Most cameras have a USB connection but that wastes camera power and sometimes renames the images, messing with your filing system. Some PCs have a card reader built in. Check the compatibility of your card reader with the card media in your camera. Also check your printer, if you can connect your camera's card to it, it may act as a card reader.

Printers

Printers are of such high quality these days that you can 'develop' at home too. The cost of ink can be prohibitive though so consider the convenience and control versus cost. If you want to have a printer produce the best quality prints then consider a 6 cartridge printer instead of the usual 3 cartridge; you'll get better color and richer, tint free blacks. There are many types of printers available and most offer very good quality. Prices rise with print speed and features. Read as many reviews on the Internet as you can before purchasing and try to see prints with you own eyes. Find out how big you can print, how smudge resistant prints are, how long they last before fading, how many prints you get per cartridge on average and their replacement cost. Look for tinting in black and white monotone images too; this is caused when colors are mixed to produce black.

Mouse

In the past I've had to use a touch pad for image editing but I much prefer a mouse for greater control. I now use a wireless mouse for my image editing as I don't like the drag from a cable which always catches on something at the worst possible moment. Tablets are popular too and might be more suited to your style of image editing.

Post Processing

Before you do anything else **back up your images** burn them to CD or DVD to provide an archive that can't be overwritten. Especially those you plan to post process. If you accidentally overwrite your original image you will have lost it forever! Read the primers to understand a few of the common controls.

Almost every photo you take will require some post processing. Whether it's a simply sharpening or a slight exposure adjustment, a black and white conversion or the application of a complex process, post processing can vastly alter and improve an image.

Post processing is the subject of many thick books so we'll look at a few of the most important techniques and see how they work for both Adobe Photoshop and The Gimp. Most often the application of several techniques will combine to perfect your image.

The Ethics of Altering Your Images

Ideally you should be striving to capture your image with correct framing and exposure, right out of the camera. With post processing being a minor adjustment. However a favorite image can be recovered, if at the time you took it mitigating circumstances or an error prevented you from getting the image you wanted.

Where a digital photo stops and digital art begins is a gray, undefined line. You have to be true to yourself about how much you digitally alter an image. You have the right to alter your image as much as you like, there is no ethical issue with that, however calling a heavily altered image a photo will upset some people. How much you care about that is up to you! Digital Art is an art form all of its own so explore it as far as you like and don't be put off trying to improve your image because you think it's not ethically correct to do so. Just be honest about your manipulations and you'll be on solid ground. The manipulating of negatives has been going since the early days of photography so you do have some latitude here!

Choosing your program

There are two sets of tutorials in the post processing section. One is for Photoshop, the industry leader in post processing. The other is for The Gimp a free open source program that will meet most post processing needs. Both sets of tutorials mirror each other and cover the basics manipulations you might want to perform.

Tutorials

There are two e-books of post processing tutorials. Download the post processing e-book for your chosen software from the www.GoingManual.com website.

Both are available for free from here.

http://www.goingmanual.com/photo/tutorial_index.php

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What people are saying about GoingManual.com and e-book.

(Names represent writers internet nicknames)

Simon, the site is great. Information is well written, precise & easy to understand. Navigation around the site is simple & very user friendly, tutorials have clear step by step instructions and diagrams. As a beginner, I seem to have so very many tutorial & photo sites saved in my browser. When you start out, you really think you need to know everything at once, it can seem very overwhelming at times just learning the ins and outs of using the camera correctly, let alone all the post processing stuff. This weekend I decided to weed out my favourites box and only keep those tutorials specific to my needs at present. Your site is now at the top of a considerably smaller list. - Dragons Lair

You ninjas definitely check this site out. I JUST came across it and immediately thought to share it. I have yet to look through it entirely, but I like what I see so far. See if you can extract anything from it. - GreyGoose

This definitely looks like a winner... Oneder

Excellent site – Bluesmap

From looking at it there are some things there that I need to spend time reading. - SeattleJerry

Looks like it has a lot of good info.- Dale

I was looking for a series of online tutorials on Photoshop. I think your articles will help me a lot. Start reading them right now. Thanks. - Molja

I recommend others, even experienced photogs, but those on the beginning side of the learning curve to check it out, it is worth your time to. - Bradm

The site looks excellent Simon. Loads of information that I am excited about getting my teeth into. - Fitzpayne

Man, that is a sweet site! Thanks so much for sharing that! - Steve

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