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Digital Photography 101

Chapter 1: Introduction to Film and Digital Cameras

1.1 Introduction to Film and Digital Cameras

Never in the development of camera technologies have we seen such diverse and drastic changes than in recent years. The advent of digital systems and the mass popularity of the Internet have seen a new rise in the way we market and work within the photography arena. Photographers are by nature inquisitive and contemporary people, so for many the changes have been met with open arms and enthusiasm. With my infatuation with the computer and digital technologies I was quick to adjust and make the step from film to digital SLR cameras. Don't let me say that digital is the only way to go, film, particularly in larger formats, and slide film is still being widely used, as is the 35mm format which has been the work horse of photographers for many years. The fact remains digital is here to stay and so is the Internet and as photographers we need work in this arena or we will simply be left behind.

If you are involved in marketing and payment for our services it is simple to see that we don't have the restrictive film cost anymore, so we can take more photos, which means more marketable images. The presentation method of a website is an affordable and easy method of getting your samples out there and opens up a whole new world to market. It is not unusual to regularly sell images to overseas clients.

Where once at a wedding a photographer would shoot 4-6 rolls of pro-film and be selective about what he or she is taking, we can now shoot hundreds of photos. Up to 3 frames for each opportunity. The likelihood of getting it wrong is reduced because of sheer numbers of shots. Click, click, click, and instead of click Thank you!

Because of digital we are seeing a greater number of better quality photos and new photographers are coming to the game with more affordable and better equipment opening up opportunities that were once restrictive. I have seen results from digital SLR cameras and kit

lenses that are priced under NZ\$2000 that are all you would ever need.

In this course I will openly discuss what I have learned about taking photos, getting a job or freelancing your images in today's world.

Where it is all heading, who can really tell? I would hesitate to guess. Fifteen years ago I for one did not see the digital or the Internet revolution in photography coming. The way I see it I would rather have the joys of Photoshop in my hands then messy and potentially dangerous darkroom chemicals and spend ten minutes emailing photos to a client.

Having said that, I do believe film still has a place, if only for the short term. Shooting digital photos requires conscious competence in computers and the cameras. If you do not have this ability, then you are better off shooting film until you are ready. Photography is about capturing precious memories to be enjoyed by many and the digital transition needs to be made with confidence. I hope this ebook helps you in your journey.

1.2 Camera Types

There's a camera made for every person and budget. It depends on what you want out of a camera and the purpose of its use. It is far less likely that a professional photographer would want to use a cheap little camera, which Dad might use to snap a few photos on the family holiday. They are more likely go for the professional models more suited to the demands of reliability and performance.

There are four levels of cameras on the market today. By describing each level I will attempt to enlighten you on the pro's and con's of each.

The consumer brands



These cameras usually have a plastic body and a plastic lens. Some may have limited focal length such as an optical zoom feature. The resolution and features are increasing all the time but resolution is not everything because the lens systems must be able to keep up and resolve the higher resolution. These are consumer brands and not professional units. Cost \$150-\$500.

Advantages:

- Cheap and easy to use for snap shots
- Light and small
- Fully automatic

Disadvantages:

- In digital the small resolution means smaller prints
- They may require lots of batteries and run out of power just when you need it. It pays to carry spare batteries.
- Some will have memory cards but most have a limited storage
- They are slow to start up and there is a shutter release delay in taking the photo with the digital brands, which can be very annoying
- Because of the small apertures there is little depth of field control, which we will look at more closely later

The Prosumer Brands



High resolution and highly featured digital cameras are all the rage at the moment in the NZ\$500 to NZ\$1500 price range, and so they should be. They offer the photographer compact and dependable photography with increasing resolutions, features and smaller sizes.

Advantages:

- Higher resolution means larger prints and enlargements
- The batteries are advanced and rechargeable and will keep it going for many shots
- Presets take the guesswork out of photos for all situations
- Many have a short movie mode which is of interest
- Getting smaller all the time. I prefer larger cameras as they are easy to hold on to
- These are not professional cameras but any photographer can take excellent photos on these cameras

Disadvantages:

- Some brands can be slow to start
- Selecting shooting modes can sometimes be more involved than the next level of SLR cameras which have dials as well as LCD menus
- Some brands can have a shutter release delay in shooting, find out when you purchase, as this is an issue
- You cannot interchange the lenses but you do have an excellent zoom range on many brands

Consumer branded SLR (Single Lens Reflex)



Definition of SLR is a type of camera that uses a prism and mirror system allowing viewing of the subject through the taking lens of the camera. The photographer looks through the rear of the camera and sees the subject (and focuses) through the lens. When the picture is taken, the mirror swings out of the way and the film or the digital sensor of CCD is exposed.

These are cameras where you can interchange lenses to the body. Entry-level consumer SLR cameras have a huge market as the amateur photographer strives for greater opportunities for creative pictures and better images. In many cases excellent results can be obtained but with less reliability and function than the more expensive professional models of SLR cameras. Costing NZ\$1,200 to NZ\$2,000 These cameras usually come with a consumer branded kit lens, which has an inexpensive wide angle to midrange zoom. In film the format or film size will be 35mm. Many professional photographers will be happily using the consumer digital SLR bodies in many situations but it is regarded in general, that these are not professional branded cameras.

Advantages:

- Good acceptable images can be achieved for most applications
- In digital the high resolution, over six million pixels, means larger prints
- Fast start up and fast shutter release for shooting
- Fit a better lens on them to really open up the possibilities
- Reliable and dependable with long life rechargeable batteries and

lots of storage on detachable memory cards
· A lot more affordable than the pro bodies

Disadvantages:

- Less compact than the prosumer brands
- Less reliable than the professional brands

Professional Brands



How much do you want to spend on a camera? If photography is your work and you demand reliability, superb handling and performance you may want to extend your bank overdraft and invest in the top level of professional camera bodies.

Professional technology was until recently the domain of medium format and large format film cameras. This came from an understanding that the larger the negative the better and sharper will be the print enlargement. Some photographers still regard these film formats as being superior to any other media. The cost however of shooting large format film is a disadvantage to shooting lots of images in high resolution digital in a superbly built camera. A camera such as this will most likely be the main body in a professional photographer's kit today together with some impressive lenses.

Advantages:

- Excellent handling and performance
- High resolution up sixteen million pixels means large quality prints
- Excellent image results
- Fast, reliable and long battery life between charges. 300 to 500 are expected

Disadvantages:

- These cameras are not for the lighthearted traveller. They are large and heavy
- They are priced for people who make a living out of photography
- Excellent bodies demand excellent lens adding to the cost but also to the quality of the images

Higher level professional brands



The next level of cameras beyond the digital SLR's in the professional models are the super high resolution digital back systems now offering resolutions up to fifty million pixels, coupled with high quality lens systems. The European cameras, such as the Hasselblad brand, can be found in major fashion photography studios all over the world. A camera system like this will cost you many thousands of dollars.

So what camera for you?

As there will always be better brands and features being introduced all the time, each aimed at a particular market, it all amounts to what you want from your photography and how much you can afford to spend.

Let's now look at the technology of camera equipment.

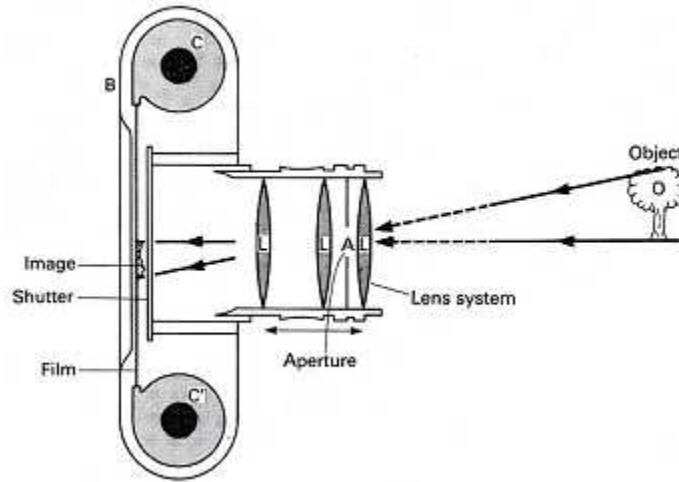
1.3: How a film camera works

What is film? Material used in a camera to record a photographic image. Generally it is a light-sensitive emulsion coated on a flexible acetate or plastic base.

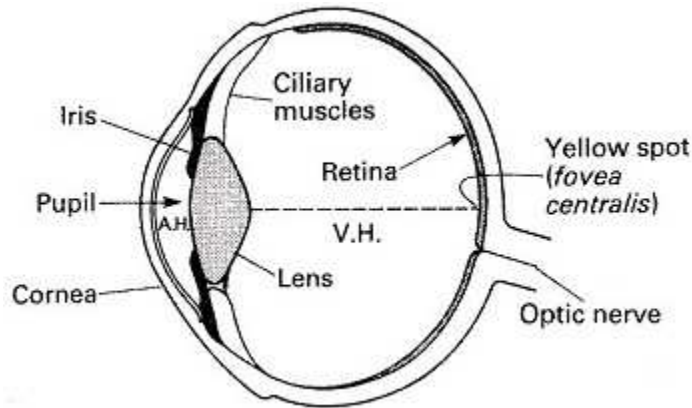
How does a camera expose the film to make the image? You need to use lenses, and better cameras have better lens systems resulting in better images. To actually get an image on to the film, the lens focuses the incoming light on to the film plane. The science of forming images like this is called 'optics'. To record the image, all ordinary cameras use film, which contains chemicals that change their nature when exposed to light. These chemicals are on such tiny grains that you have to blow up a picture many times to see the "graininess". A chemical process is required to transform the film into negatives and another process creates prints from the negatives.

The lens camera is simply a man made copy of the human eye. It has an opening or an aperture to let in light similar to our pupil and a light sensitive surface, a CCD in digital, which is similar to the retina at the back of our eyes. The main difference is in the lens systems. The human eye controls the focal length with ciliary muscles, which adjusts the lens to bend the light to a focal point. In the camera the focal length of the lens is consistent. Objects at a different distance are focused on the light sensitive surface by simply moving the lens. Let's look at these diagrams of the camera and the eye...

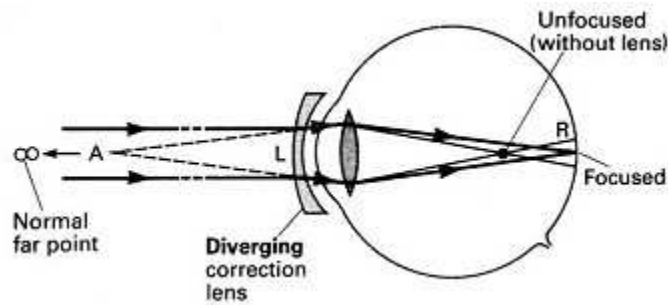
The camera



The eye



The eye capturing light with a corrective lens



Lens action

The camera consists of a light sensitive box with a lens system in the front. A shutter is placed between the lens and the film. When a photo is taken the shutter opens and closes rapidly and exposes the light sensitive surface for a short period of time.

The light enters the lens through an adjustable hole or aperture in the lens and it stands to reason the larger the hole the more light will enter our camera if we hold the shutter open for the same period of time. The relationship between aperture and shutter speed controls the exposure on the light sensitive surface. We will look at this in detail in later chapters.

Film action and ISO

We will not go into properties of film and what chemicals are involved as the purpose of this course is to focus on digital technologies in the modern world however, there is one property of film which has been carried over into modern digital SLR technologies and that is film speed measure originally in ASA or American Standards Authority and now measured in an International Standards or ISO. The film speed is a measure of how quickly the film will become correctly exposed when in use and how long will the light sensitive materials take to react to the light. A fast film or high ISO of say ISO800 can be used in low light, as it requires a relatively shorter time to correctly expose. A slow film or low ISO of say ISO200 will take longer to expose hence the aperture will need to be larger or the shutter will need to be slower. So why would you use a low ISO at all you may ask? Well graininess or speckles will be more noticeable at higher ISO or film speed. It is a balancing act between correct exposure and picture quality. In digital we call this graininess 'Noise'.

I prefer to shoot at 100 ISO when I can and sometimes take it up to 500 ISO for sports shots in low light. The idea is to use a faster lens with a larger aperture to let in more light so you can use a lower ISO but this may not be available to you, of course, a grainy photo may be just what you are wanting. Remember ISO ratings have been carried over to the digital world because a digital CCD reacts to light too. The wonderful difference is being able to change the ISO setting on the

fly. To do this with film you would need to change to a higher ISO roll of film.

Let's now look at digital cameras

.4: How a digital camera works

The digital camera was originally developed by NASA to send images back from outer space. It has been the advent of personal computers and the internet that has made them mainstream image-capturing devices.

The principals of the light tight box are the same except the light sensitive surface is no longer film but has now become an electronic device called a CCD or Charged Coupled Device.

A Charge Coupled Device is one of the two main types of image sensors used in digital cameras. When a picture is taken, the CCD is exposed to light coming through the camera's lens. Each of the thousands or millions of tiny pixels that make up the CCD converts this light into electrons. The number of electrons, usually described as the pixel's accumulated charge, is measured, and then converted to a digital value, which also records the colour values.

This image data is then stored on a chip in the form of digital memory. This is an example of an external memory card used in digital SLR cameras. This card will hold 512 Megabytes of data, which equates to about 140 jpg files at six million pixels.



We will look at resolution next.

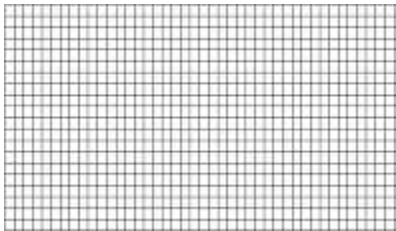
1.5: Resolution

Resolution is something we are bombarded with in the digital world. It has created a whole new realm of confusion in what is required to make a good print to a specific size and in what file format. I hope to make it a little clearer for you.

Resolution is the number of pixels in an image. The more pixels, the higher the resolution. The higher the resolution, the bigger the picture. (A pixel is a coloured square dot.)

I have inserted a table to help demonstrate what we mean by resolution. This table is fifty pixels wide and twenty pixels high. Each square is a pixel. The resolution of this table is 1000 pixels because $50 \times 20 = 1000$.

Your consumer branded digital SLR camera may be 6 million pixels or 3000 x 2000 pixels. That's a lot of tiny squares.



We hear a lot about DPI. DPI is Dots per Square Inch and is a standard of measurement for the resolution of images. The higher the DPI, the higher the resolution.

The relationship between DPI and resolution can often cause confusion, but remember the lower the DPI the less pixels we need to fill a square inch.

If we take our six million-pixel image and print it at 200 dots per square inch it stands to reason it will end up being a lot larger than if we printed it at 300 DPI.

So what is the standard and how so? RGB (RED, GREEN, BLUE) Printing systems such as laser printers are getting better and able to use lower DPI to make larger prints from smaller resolutions. If we are selling a photo to a publishing company for use in a calendar then

they will probably want to print it on an OFFSET printing method and will require the image to be at least 300 DPI. Offset printing is a method, which uses four coloured plates or CMYK. Cyan, Magenta, Yellow and Key (black). The paper or media is passed over each plant to introduce each colour with the blending happening on the paper.

A six million-pixel file will print to about eleven inches on its longest side at 300 DPI. We can use Photoshop to increase the resolution to accommodate larger prints, which we will discuss later. We will also go over printing methods, file types and colour space when we look at Photoshop.

To better understand DPI let's look at how the human eye sees pixels. We do not want the viewers to see each pixel, as we want them to see a blend of dots creating a seamless image. When viewed close up the tiny dots in a good quality print will become blended to the eye at 300 DPI and over.

Our computer screens are different. We are seeing a light source coming direct into our eyes from our screens so the DPI can be a lot lower to create the same seamless blending of colour. This is called additive colour mixing. On our screens this can be 72 DPI and over, which is why our screens are about 1200 pixels wide and 800 pixels high. That's only 960,000 pixels.

It stands to reason the higher the resolution the bigger the print at the same DPI. I will try and give you a better understanding of resolutions when we cover Photoshop later.

1.6: Manual, Automatic and Semi Automatic Camera Systems

When we take a photo and create an exposure we use the following systems in our camera

Shutters... The speeds of which we need to control to freeze or even blur movement. Compare this to your eyelid.

Apertures... Holes to let in the light within the lens. The size of which we need to control depth and the amount of light entering our camera. Compare this to your eye pupil.

Focus... Everything we see will be a certain distance. So the lens

elements will need to be adjusted to bend the light onto our light sensitive surface.

Light metering... How can we tell how much light is available and what to set our shutter speed and apertures to create a correct exposure. Modern cameras automatically control this in various ways.

Lighting... Will our photo require additional lighting or flash to correctly expose it? Something to consider if there is not enough natural light to gain a fast enough shutter speed. You can only safely hand hold a camera down to 60th's of a second.

Different cameras come with different combinations of systems for each of the above. As an example let's look at the command dial of a typical consumer branded SLR digital camera. This camera has the ability to be fully manual with the AUTO mode selected, Automatic Preset combinations depending on your photography desires. (Bottom of the dial) or Semi Automatic (top of the dial)



S is for Shutter Priority. In semi auto mode we can control the shutter speed and the camera will control the aperture to create the correct exposure. Very useful when you want to use a higher shutter speed of say 500th of a second to freeze action or a much slower 30th of a second to blur a waterfall. The amount of light will control what we can do. Too much light for a slow shutter speed will result in over exposed photos or blown out images. Too little light for a fast shutter speed will result in a dark photo or under exposed.

A is for Aperture Priority. In semi automatic mode we can control the size of the aperture. This is where it can get a bit tricky. Aperture is measured in f-stops and the lower the f-stop number the bigger the

hole will be. Yes an aperture of f2.8 is a much larger hole compared to an f22, which is more like a pinhole. The size of our aperture not only has an effect on our required shutter speed but also the photos we take. If we want to blur the background in our photo we would need a larger hole compared to a photo where everything is in focus. This is called shallow depth of field and I will explain this in more detail further on in our course. We can control the aperture and the camera will select the required shutter speed.

The focusing command is not defined on this knob because it is somewhere else on the camera body. Focusing can be automatic (AF) or the photographer can set it manually. Auto focus is usually so much more reliable. However there are situations where a camera will be tricked into getting it wrong such as focusing on an animal behind bars at a zoo or a low contrasting scene. There are also different AF systems available to us.

M is for manual override. We set the shutter speed and aperture to fully control our exposure.

AF Systems

- Spot AF... based on the centre part of frame
- Dynamic AF... is a clever system where a camera will track a moving and erratic subject anticipating where it will go next
- Closest subject...means the camera will choose the closest object in the frame and focus on that
- Continuous mode... is a useful feature in more expensive cameras which will keep re-focusing on a moving object when the shutter is pressed half way down.
- Focus lock... by pressing the button half way down we can lock the exposure and the reframe the composition for the final exposure. This feature is available on most cameras today

Light metering

is another advanced system in our cameras. All modern cameras have a system for measuring light to give us the required parameters

to set our shutter speed and our apertures. A typical SLR camera will give us options here too.

- Spot metering is based on the smallest part of our frame usually in the middle. Good for sports and portraits
- Centre Weighted metering will give us a larger part of the frame in the middle of the viewfinder. Very useful for weddings or portraits of people where the correct exposure on the persons face is paramount
- Matrix metering means the cameras computer or CPU will look at the entire frame to obtain a good average balance across the frame. Good for Landscapes

Lighting

Natural ambient light is the best lighting we can use but like anything good it sometimes cannot be relied on to be available. High overcast cloudy days provide excellent diffused sunlight. Direct sunlight itself is too contrasting. The camera is not as good as the human eye in defining full light and shade but maybe one day it will be. We can substitute natural light with artificial light and sometimes use a combination of both.

The most convenient and affordable form of lighting a subject will usually be flash. In the auto modes the flash will operate where necessary. In the semi auto mode we will need to select the flash if we wish to use it. Most consumer branded SLR cameras have difference flash settings.

- Red eye reduction will send out a pre-flash prior to the main flash to shrink peoples' eyes so we can't see the red retina reflected in our exposures
- Slow sync will flash at the beginning of a long exposure to freeze a subject in the frame
- Rear curtain sync will flash at the end of a long exposure to freeze a subject in the frame at the end of the exposure. An excellent feature for creative artistic flash photography.

So why would you set values in the camera if it can do everything for you?

As an artist you would want to have as much control over your

images as possible. With more experience you will find you can take much better images in the semi auto modes and even in fully manual. If you are happy with the images by simply pointing and shooting snapshots then that is up to you. Personally I prefer the semi auto modes for fast moving situations and fully manual for when I have more time to think. I don't use the fully automatic mode in my digital SLR cameras.

It stands to reason the more expensive professional brands are much better at all of the above but you can expect excellent results from modern Consumer Branded SLR cameras and even from the excellent Prosumer brands on the market today.

1.7: Lens Technologies

The lens on a camera is what focuses light onto the focal plane to create an image. It is a cylindrical tube that holds a series of concave and convex lens elements. Light enters the lens through a hole or aperture and is bent to a focal point by the series of lens elements. Depending on the quality it will be made of plastic or glass.

The focal distance of a lens is the distance between the film plane and the focal point (optical centre of the lens) when the lens is focused at infinity. The focal length of the lens is marked in millimetres on the lens mount. The principle focal point is the position of best focus for infinity. There are two principle focal points; if a lens is turned around a second focus is obtained. 'Reversed' lenses are often used in close-up Macro photography because using a lens reversed allows a closer focusing distance.

Confused? It is not my intention to give you a detailed science lesson on optics used in photography but to introduce you to the different kinds of lenses and varying quality levels used today.

A wide-angle lens will have a focal length of 12-35 mm with a good useable average of 18mm. These lenses are great for panorama landscapes and photos of groups of people. It is important to remember that a cheaper lens will have more distortion issues than a more expensive lens. For example there is a distortion in wide-angle lenses called barrel distortion. This is the bending of horizontal lines such as the horizon in a wide angle landscape photo and it will also

make objects towards the edge of the frame appear wider than they are. This can have embarrassing consequences if you are taking group shots at a wedding. The idea here is to understand the limitations of your lens and use a longer focal length of say 35mm on a wide-angle zoom lens. A fisheye lens will have a very wide focal length of 10mm and will bend lines in a desired effect.

A normal lens will have a focal length of 50mm because it will give us a field of view, which is the same as the human eye. You can say our eyes are calibrated to a focal length of 50mm. Yes, that is the distance from the front to the back of your eye!

A telephoto lens is a magnifying lens with many elements depending on the quality. The above lens is a telephoto lens or long lens. This lens will be 50 to 500mm with a 70-200 mm zoom in an average kit. They have a very narrow angle of view at larger focal lengths and a very shallow depth of field. They are perfect for separating a subject such as a person from the background and for sports and action photography. If a basic distortion effect is desired, they will also magnify the background in a composition making it appear closer to the focused subject than it actually is.

We have looked at focal length in a lens, now let's look at the types and quality of lens systems.

A prime lens is a lens with a fixed single focal length. A prime lens of 100mm is excellent for portraits. The advantage of a lens like this is that they have less elements and better quality images as a result. They can also have larger apertures of say f2.8 or even f1.4 letting in more light and creating a very shallow depth of field. You may have seen sports photographers using very large lenses on the sideline? This will usually be a prime lens of 300-500 mm with a huge aperture of f2.8 for a lens of this size. Letting in lots of light even in the dim light of a sports stadium. The very shallow depth of field will create amazing tight action photos. Most press photographers will be using one supported by a monopod, which is a single leg pole.

A zoom lens is a compromise between quality and function. It can be expected that the larger the zoom range the less the quality of images will be. The results will not be as sharp. With the advent of

aspherical lenses we have seen very small lightweight super zooms come on to the market. 18 to 200 mm zoom is now available which can make for an excellent travel lens. A professional photographer will probably be using two kinds of lenses. A wide angle to midrange zoom such as 18-70mm and a telephoto zoom of 70-200mm. A prime lens of 300mm may also be in the kit if wildlife and sport are on the cards and a full frame 100 mm prime lens for portraits and macro. Some less expensive zooms will not keep a constant aperture through the whole range. At 70mm it may be f4.5 but at 300mm the hole will be a lot smaller compared to the focal length and may be f5.6 and this is typical on low-end lens systems.

Quality of the lens. They have larger apertures and better build quality. Cheaper lens systems will have a plastic body and sometimes plastic lens elements. The aperture will be smaller in relation to focal length and f4.5 is typical. A professional will want glass that lets in more light so he can use a faster shutter speed and a lower ISO to eliminate grain. They are also known as fast glass. A lens of say f2.8 at the desired focal length is typical. This lens will be made of glass, carbonate and metal fittings.

Expect to pay a lot more for those extra stops of light available in a pro lens. Most of the image quality is directly related to the quality of the lens. It is far more desirable to use a cheaper body and pro-glass rather the other way round. Why would you put cheap tyres on a Ferrari? Invest in a better lens and upgrade your camera later making sure the lens mounts will be compatible. It is very expensive to change your whole set up. Nikon lenses are not compatible with Canon.

Vibration reduction (VR). A new feature in Pro lenses and is slowly being introduced to the Prosumer market. It uses a CPU in the lens to adjust shutter when handholding a lens. This can eliminate shutter blur at slow shutter speeds. Shutter blur is often mistaken for out of focus images because the effects are similar. We will look closely at shutter speeds when we do exposure in detail later. VR means that a camera can be carefully hand held down to 30th of a second at 60mm focal length than the normal 60th of a second, which is a huge difference in dim light. Notice how the usual safe shutter speeds for hand holding a camera are the same as the focal length? This is an

important rule of thumb for all photographers. Of course with VR, the shutter will open longer and the subject will still blur if it moves. The best combination for the professional photographer is to use a larger aperture to let in more light and VR to eliminate shutter blur. Budget permitting of course! Most manufacturers have a lens that has both.

Let's look at how we name a lens by looking at a labeled professional lens.



Nikon AF-S VR Zoom-Nikkor 70-200mm f/2.8G ED-IF

This is typical of what a professional photographer will aspire to have in his or her kit. It is a telephoto lens of 70-200mm, which is a very useful range. It has Vibration Reduction to reduce shutter blur and a large aperture to capture lots of light. It is an excellent compromise to a prime lens of fixed focal length. A lens like this will cost you.

AF-S means Auto focus (AF) and with a silent (S) fast motor inside the lens

VR is for Vibration Reduction

Nikkor is the branding

70-200mm is the zoom focal length

f2.8 is the largest aperture opening in the lens



G means that the lens mount is a G type making this lens compatible with all Nikon and some other camera systems using the G type mounts

ED is glass developed and trademarked by Nikon and used in telephoto lenses to obtain optimal correction and improve sharpness

IF or internal focus is a system used where the internal elements in a lens are the only parts of a lens that move during focusing. This prevents the physical length of the lens from changing and allows for faster focusing and facilitates the use of filters that require specific elements such as polarizers and graduated filters. More on filters later.

Now I have introduced you to the types of SLR lenses available, there is only one thing I need to stress and that is the difference between lenses for digital and 35mm film cameras. A CCD is smaller than a 35mm film frame resulting in a smaller angle of view with the same lens. Put it simply and it's like cropping an image!

The conversion factor is different for each manufacturer, but as an example Nikon have a conversion factor 1.5 in a lens built for film used on a digital SLR camera.

A lens built for a film camera may have an angle of view of a 28mm lens yet the same lens on a digital SLR will be 42mm.

A disadvantage if you are shooting at wide angles but an advantage if you shoot telephoto, as your 300mm lens will now have a focal length of 450mm getting you very close to the action.

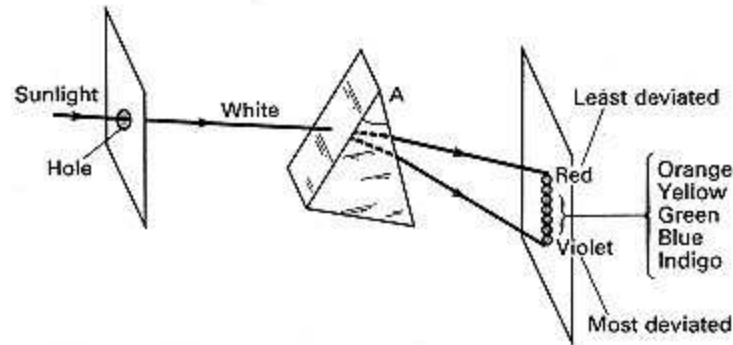
Lens manufacturers are now making lenses only for use on digital camera's keeping the angle of view consistent to the focal length. A D type lens can be transferred to a film 35mm camera but you will get massive vignette at the wide-angle settings. Vignette is like looking down a tube and can also be caused by a combination of filters and wide angles.

That's it for today on lens technology. We will look now at basic colour science and pick the brains of Sir Isaac Newton.

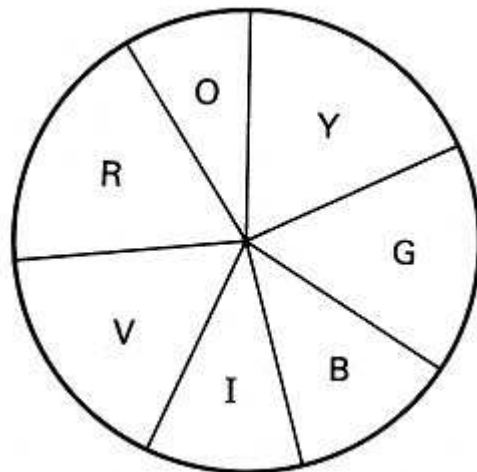
1.8: Basic Science of Light and Colour

In order to take and manipulate a nice photo we must understand fully the main ingredient to a photo and that is light.

In 1666 in Cambridge, Great Britain the great physicist Sir Isaac Newton was alive and making his experiments that would give rise to the amazing world of optics, colour and photography. One of his greatest achievements was a reflective lens used in telescopes today. He also discovered the colours of light. He did this with a simple prism lens and turned white light into the seven-colour spectrum. Rain drops in the atmosphere have a similar effect to the prism and depending on where you are standing you will see the colours in the atmosphere as a rainbow.

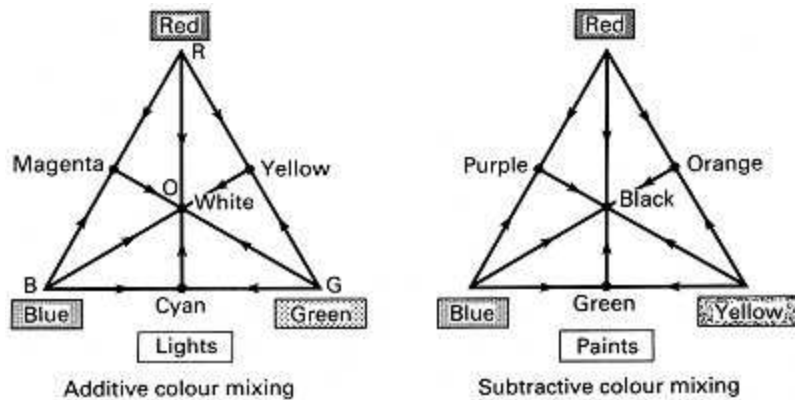


He then gave us his colour wheel which, when we spin it, will go grey white because we are mixing the colours and white light is a blend of seven main colours.



I have drawn up a subtractive and an additive colour triangle for you to consider (below). The primary colours of paint are red, blue and yellow. The primary colours of light are red, green and blue. By mixing these colours together we create our secondary colours shown as halfway points on our triangles.

Colours opposite in the triangle are said to be complimentary to each other because mixed together they will make what is in the centre of the triangle.



Why is there an additive and a subtractive colour triangle?

Mixing paint is due to a subtractive process. Pure light has already been manipulated; for example blue paint has absorbed all light except the blue and green, which it reflects back to our eyes. A yellow flower is yellow because it will absorb most of the other colours of white light and reflect only the yellow. Take away the light and the yellow flower is now dark or black. It is the same with paint.

When light is coming to us from our computer screens it will be the additive triangle we will be interested in because our screen is a light source and we are mixing light to give us the colour we will see with our eyes. You will have to get used to the RGB or Red, Green, Blue terminology, as it will crop up all the time in modern photography.

Sir Isaac Newton also discovered that light travels through space as electromagnetic radiation at various wavelengths depending on the visible colour he saw in his rainbows. He was suspicious there were other colours present beyond the spectrum that the human eye could

not see. Further detailed use of lenses resulted in an amazing discovery. Infra red and ultra violet light rays.

Ultra violet has shorter wavelengths than visible light and will cause certain material to fluoresce and also affect photographic plates. Ultra violet light will also make your skin go brown and is known to cause damage to the eye and skin cancers, which is why we must cover up when we are out taking photos in the sun.

Infra red on the other hand is at the other end beyond the visible spectrum and has longer wavelengths. Sir Isaac noticed how the rays were not scattered by fine particles as much as rays in the visible spectrum. Later science would develop cameras, which would make use of infra red light by building filters that would block all other wavelengths and photographic plates sensitive to only infra red light. Photography at night and in hazy, misty conditions became a reality. Digital systems that do this have also been developed.

In case you are wondering why the sun is yellow? I am sure?

Well light contains more yellow than any other light and there is balance indifference, which makes the sun look yellow to us. Remember this because we are now going to have a look at why our photos can sometimes have a colour cast to them. This is called the colour temperature or the White Balance.

1.9: White balance, colour casting, colour temperature resulting in warm and cool tones

Not more science to consider! As an artist you are probably thinking with a side of your brain not overly interested in physics, but please be patient here and do some basic learning. Photography is a wonderful mix of science and creativity and the most successful image makers will from time to time be thinking with both sides of the brain and analyzing the science required. This is very important when we consider what filters to use, when and why.

Colour temperature is a term that is borrowed from physics. In physics we learn that a so-called "black body" will radiate light when it is heated. The spectrum of this light, and therefore its colour, depends on the temperature of the body. You probably know this

effect from everyday life: if you heat a steel bar it will eventually start to glow dark red ("red hot"). Continue to heat it and it turns yellow (like the filament in a light-bulb) and eventually blue-white. Be careful with the terminology here! The hotter the body gets (measured as the temperature in degrees Kelvin) the more the colour moves from red towards blue. But we say that red is a "warmer" colour than blue! So a warm body radiates a cold colour and a (comparatively) cold body radiates warm colours. I know, it's confusing. The photographic colour temperature is not the same as the colour temperature defined in physics. As mentioned above, the photographic colour temperature is measured only on the relative intensity of blue to red. However, we borrow the basic measurement scale from physics and we will measure the photographic colour temperature in degrees Kelvin (K).

The following table should give you some feeling for the scale.

Colour Temperature	Typical Sources
1000K	Candles and oil lamps
2000K	Very early sunrise; low effect tungsten lamps
2500K	Household light bulbs
3000K	Studio lights and floodlight
4000K	Clear flashbulbs
5000K	Typical daylight and electronic flash
5500K	The sun at noon
6000K	Bright sunshine with clear sky
7000K	Slightly overcast sky
8000K	Hazy sky
9000K	Open shade on a clear day
10,000K	Heavily overcast sky

11,000K	Sunless blue skies
20,000+K	Open shade in mountains on a really clear day

This means that you will find photographers talking about "daylight balanced" film (nominally 5500K) and type A and B tungsten balanced films (3400K and 3200K). When used in the right situation it makes the subject take on natural colour casts similar to how our own eyes would see it.

Our eyes are very clever when it come to adjusting to colour temperatures and will make white look white under most conditions except for in darkness. If our white subjects look white then it stands to reason other colours will be consistent. A camera lens is not so clever and this is why we can't just shoot all situations in daylight balance film at 5,500 K. If we did the shadows at 9000K will take on a blue or cooler casting and the house hold light bulb at 2500K will make our photos seem orange or red.

This is specially so in portrait photography and weddings are a good example. Say we have daylight balance film and we are taking a photo of the bride and her face is in shadow, which is desirable to eliminate squinting into the sun. Because the colour temperature is in shade the resulting photos will give her face and veil a blue casting. In traditional professional photography we would compensate this by using a red warm up filter. What a hassle!

Light balancing filters are used to change the colour temperature of light. If you place a light-balancing filter in front of your lens, the overall temperature of the scene will change. These filters are sometimes called conversion filters because they may be used to "convert" daylight balanced film to use in different lighting conditions. This is additive colour mixing that Sir Isaac Newton discovered.

Color	Name	Effect
Cyan	Cyan	Absorbs Red
Yellow	Yellow	Absorbs Blue
Magenta	Magenta	Absorbs Green
Red	Red	Absorbs Blue and Green
Green	Green	Absorbs Red and Blue
Blue	Blue	Absorbs Red and Green

Along came Prosumer and SLR digital cameras and things got a little smarter in the white balance department. Now we can simply dial up how we want our cameras to react to colour temperature. We can do this on a simple scale we select or with the more expensive SLR and Prosumer cameras it will measure the colour temperature for us. Using the Automatic White Balance mode we can leave it to the camera and even choose to warm up the auto setting or cool it down with compensation. I leave my camera on auto white balance and warm it up a bit by -3 on the compensation. If I am photographing in shade I will choose the shade preset, as often the camera will get it slightly wrong in auto mode, which is typical. I have a greater understanding of what I want than my camera does. If I am shooting in RAW file format I can fine-tune the white balance later in postproduction or I can change the colour balance in Photoshop. More on this later.

With fast moving situations you are best to leave the white balance on auto as your light will be changing all the time and with it your colour temperatures. You don't want to be photographing under lights and then go outside into the sun with the same white balance. If we did, all our photos will have a strong red colour casting over them.

As with all camera systems the more expensive and professional the body of the camera the better it will be at auto white balance.

1.10: Scanning photos and using the scanner as a camera

The modern digital camera is not the only photographic tool at our creative disposal. The scanner can also be used as a camera for transforming photos into digital files or three dimensional objects into photos.

This image of Kauri Tree leaves was taken with a flat bed scanner with a protective glass plate inserted. The scanner will not see very far so black paper over the subject replacing the heavy lid, made a very desirable dark background.



What is a flat bed scanner? An optical machine in which the original image remains stationary while the sensors pass over or under it. The scanned image is held flat by the lid, which also blocks ambient light.

Some scanners have adapters, which will also scan negatives and slides to very high resolutions. A 35mm slide can be scanned to 30,000,000 pixels. This will make a very large print. However, the quality of the slide will need to be very good.

The main disadvantage of scanning prints and slides to make digital files is the time it takes. You will almost always have to retouch dust marks with the clone brush tool in postproduction. Scanning slides will give wonderful rich colour and higher resolutions but for everyday use my pro-slide scanner does not get a lot of work anymore. It is a lot easier to shoot digital in a good camera.

If we are scanning photos then the resolution is the main thing to consider as any colour corrections can be made in Photoshop. Don't go overboard with the amount of pixels or the scan time will take ages. If you end up with a file over 100MB then your computer is going to crunch over this at a painful pace. With a modern computer and scanner you can safely scan to 5000 pixels on the longest side, which would give you a good quality print to A3 or 16.5 inches long at 300DPI. You are getting used to this terminology now aren't you?

The main types of scanner on the market today are...

- Flatbed scanners
- Slide and film scanners
- Hybrid scanners, which is what I use
- Drum scanners will scan to massive resolutions and offer the best quality. They are very expensive.



Once again price determines quality. A good hybrid scanner will offer the average professional photographer a good compromise on price and quality.

That's it for Chapter one and I hope you have a better understanding of some of the equipment that is available to us in the creative world of photography.

Let's go on now to explore and discover more tools to make it happen in the following chapters

Chapter 2: Detachable SLR Lenses and when to use them

In chapter one we covered the basics of lens technology and discovered the difference between wide angle and telephoto lens systems. We also saw how larger apertures are usually an indication of lens quality as they let in more light, making faster shutter speeds possible in dim light. We have learned that the greatest advancement in lens technology in recent years has been the advent of silent motors for auto focus, new glass for lens elements such as the Nikon ED glass and Vibration Reduction or Image Stabilization.

So what difference does this make to our pictures? The greatest indication is clarity and sharpness in low light. Many lenses can take a great photo on a slightly overcast day and safe hand held shutter speeds of 250th of a second, at an aperture of f11, can be achieved even at a low ISO.

How did you go at understanding this paragraph?

The difference is when you point the camera into the shade on a sunny day or you are photographing at dusk. That's when performance really kicks in. You will notice the shutter speed required even at f5.6 drops to below 60th of a second. Shutter blur and the subject movement can make crisp and sharp photos an issue. If you are using cheaper glass there are a few things we can do to get the shutter speed up with a good compromise. First of all increase the ISO to 400 or even 600. ISO auto is also a great help. ISO auto is when the camera automatically pumps up the ISO to keep the shutter speed above the essential 60th of a second. You can also set your camera to sharpen more to bring up the crispness. Beware because sharpening will also increase noise or graininess.

Let's briefly go over the whys and wherefores of focal lengths, then look at filters.

2.1 Wide Angle

18-50mm



Used for group shots and greater depth of field. You will need to get close to the subject, which can sometimes be intimidating. A wide angle is especially useful for landscapes and cityscape photography where greater depth of field and a wide angle of view are desired.

Barrel distortion or the bending of horizontal lines may result at wide angles.

2.2: Telephoto

50- 500mm



A telephoto lens is useful for reportage, macro, wildlife and sports photography and 100mm is the desired focal length for portrait photos as a shallow depth of field to blur the background can easily be achieved, even at smaller apertures of say f9. Vibration Reduction (VR) becomes especially useful to aid in minimizing shutter blur in low light. In low light if you are using cheaper glass in a telephoto lens, like many do, then you can increase the sharpness and the ISO.

Remember the focal length = shutter speed rule of thumb. At 100mm you will need at least 100th of a second to minimize shutter blur. At 300mm you should be looking at 300th of a second. This can be hard to achieve with cheaper and slower glass so do what the better photojournalists do and just use your feet and get closer. Watch those wild animals! You can get great photos with many consumer branded lens systems.

2.3: Macro



A macro lens is one, which will focus very close to a subject. As close as 30 cm. A typical prime focal length of 110mm is the usual with a lens 1:1 lens reproduction ratio, which means the smaller subject will fill the frame. Another way of taking close up magnified images is to use a reversing coupler system that literally reverses a lens making it possible to get a few inches away from your subject for insects and still life objects. Natural light seems to be the best kind of light with may be a soft box mounted off camera.

2.4: Filters

There are a few essential lens filters a photographer needs to keep in his or her kit. The conversion filters used to adapt daylight balanced film to prevent colour casting are no longer necessary if you are using a modern digital camera which will compensate white balance. See chapter 1 for details. Instead we have seen the opposite become attractive with the use of coloured filters to purposely change the colour casting for artistic creativity. Using a red or warm up filter we

can turn a daylight seascape into the warm glow of a sunset as an example among many effects. All of the filter effects can be achieved in Photoshop but my attitude is to do as much you can in camera to save computer time later.



UV filters

Ultra violet filters will aid in reducing haze in landscape photography but the primary use of this less expensive filter is to protect the expensive front lens element and you should keep it fitted at all times unless you are using other filters. A UV filter will block some light but not enough to be an issue on most lenses. If you are using a UV filter on a cheaper long lens then I do suggest you remove it in low light so you can get as much light into the lens as possible. In short the front lens element of any lens can easily be damaged, even by simple wear and tear, so keep that lens cap on when your camera is not in use and fit a UV filter, unless it is absolutely necessary for extra light.

Polarizing filters

You may have heard of polarizing sunglasses, which fishermen are fond of, because they enable them to remove reflections and see into the water? Well in photography the removal of unwanted reflections can be of a great advantage. A Polarizing filter consists of two elements, the front one being able to rotate to either increase or decrease the effect. This is the circular filter, which is popular on today's lenses. Looking through the lens in an SLR camera you can see the reflections in water and on shiny surfaces disappear before your eyes as you rotate the outer element. I use this filter when I photograph cars and trucks but this is not the only use. A polarizing filter will saturate colour, especially in the greens and the blues making for highly contrasting deep blue sky in landscape photographs. It is important to note that the effects of a polarizing

filter is increased when shooting to its maximum at 90 degrees from the sun and is at its minimum facing into the sun or to your back to the sun. This filter will block about two stops of light, so don't use it unless you need and don't keep it fitted to the lens as a default. Don't double up a polarising filter and a UV filter.

Neutral Density Filters

This is a grey filter, which will not change the colour, but it will stop down the light getting into the lens and therefore slow down the shutter speed or making larger apertures possible to shallow the depth of field. So why would you want to do this? Sometimes there is just too much light to create a desired effect of movement and waterfalls are a good example of this. The motion blur from moving water is a desired effect and can only be achieved at shutter speeds of below 20th of a second depending on the speed of the water. If the waterfall is in a bright place then over exposure will be the only outcome even at a very narrow aperture (f22) This filter is like putting sunglasses on. Don't forget to use a tripod below 60th of a second to prevent shudder blur.

Neutral Density Graduated filters or ND Grad filters

Similar to the graduated filters but this filter only covers half of the diameter with the bottom half remaining clear UV glass. They come in three degrees of intensity with a standard grad filter being the most versatile.

Where to use them? Landscapes primarily, as the affect is to cut the exposure in two parts. The top will filter down the light creating a correctly exposed sky and the bottom half will let more light through to correctly expose the foreground. Making for a much more natural composition, similar to how the eye would see it.

Filters can make all the difference to your photography and will become an essential part of your kit. A good tip is to have a soft blower brush on hand to gently remove unwanted dust from filters and lens element as you attach them and make sure you buy filters that will fit your lens, as there are many size variations. Also don't stack your lenses on top of each other as this will create vignette or tunnel view at wide angles and stop lots of light required for a faster

shutter speed. Clean your filters and lens elements with an approved solution and a clean purpose made cloth and ensure your hands are clean, holding them from the outer edge. Did I really need to say that?

2.5: The Lens Hood

The lens hood is not to be confused with a lens cap. The hood shadows the lens and helps prevent lens flare from the sun. There are times when it is not of any use to you and that is in flash photography, where it can often create a shadow of itself at wide angles especially when using the built in camera flash which is low to the angle of the shot.



Often a lens hood used in conjunction with filters will create vignette at wider angles and make sure it is correctly attached. New hoods can sometimes need a bit of force to put them on, which can often result in an improperly fitted lens hood. Trust me, I have done this!

Let us now look at compositions and shooting techniques in the next chapter.

Chapter 3: Composition and Shooting Techniques

There are many ways we can photograph a single subject and a good photographer will be thinking of how to create something unique and special in any scene. Sometimes it is as easy as changing our angle of view and getting down low or being above the subject. Getting in close to focus on a part of the overall picture can often be what we need to do. A beanbag is very useful for supporting a camera when lying down for that low shot.

Let's look at some techniques and go on to look at how to handle a camera.

3.1: Reportage and Portraits

Reportage photojournalists will often be looking for unique angles to create interesting compositions. The French tilt has become popular in wedding photography, as the composition at a 45-degree angle can sometimes be desired but may be drifting off in fashion. Black and White wedding photos are making a comeback. Trends do come and go in photography.



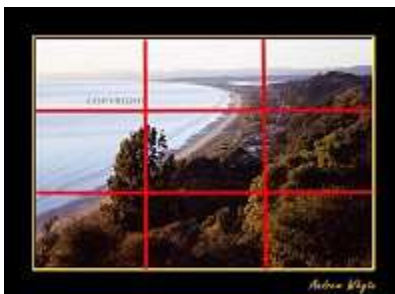
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3.2: Landscapes

For landscapes the rule of thirds is as relevant today as it was fifty years ago. In your mind divide your composition into three parts across and three parts down. Arrange your composition into the frames. Try and avoid the main focus area of your composition falling into middle of the centre frame. This will have the desired result of well-balanced composition.



3.3: Balance

It is important to remember that the typical human eye will follow an image from top left to bottom right so a composition that leads the

eye through with interest is desired. If you are photographing a moving subject then the direction of movement should be left to right. You can always use the mirror effect in Photoshop to change it around if you need.



There are other ways we can manipulate the eye of our viewers. A composition involving people or animals facing the lens will become the centre of interest and effectively stop the eye from looking beyond into the distance. The opposite can be achieved with the subjects facing away from the lens and into the distance. The eye will follow the gaze of our subjects.

Streams flowing towards us are often more appealing as the water becomes the centre of interest. A stream flowing away from us can be appealing if we want our viewers to notice the mountains beyond the stream.

Movement is often very appealing. A slightly slower shutter speed, with practise, can often result in motion blur of part or all of a subject. The same balance can also create motion-blurred effects in the

background as we follow or pan the subject in our shot. A long lens is very useful for this.



Depth of field can highlight a subject in a contrasting way making it stand out, as the centre of interest and a shallow depth of field are often desired for still life and nature photography.

Your compositions will be personal to you and your style. Many of the great photographers have developed unique ways to capture the attention of the viewer and create a pleasing or even controversial image.

3.4: Handling and holding a camera

Hand holding a camera requires a steady hand and therefore a sturdy stance.

Place one foot in front of the other and squeeze the shutter rather than jab at it. Keeping shutter blur to a minimum is essential especially at shutter speeds at or below your focal length. 60th of second being the minimum you can safely hand hold a camera.

Modern Vibration Reduction systems VR also help at even lower shutter speeds

The more expensive professional SLR cameras are larger and have a vertical grip and even a second shutter button, creating an excellent platform to support the camera. You may find holding out your palm under your camera provides a good support.

You should always use a strap on your camera and you can either wrap this around your wrist or place it around your neck to rest the camera. Always use it to some degree, as you don't want to drop your camera. Put it around your neck if you're shooting over water or a cliff.

Tripods are essential in slower shutter speeds. The taller more sturdy tripods are great for general use as the added weight will stop it blowing over and give maximum support to the camera. The idea is to prevent any movement. A lightweight aluminium tripod is excellent for hiking and for supporting lighting systems, including a remote flash. Watch the wind and your expensive gear. When using a tripod make sure you use your self-timer feature so you don't have to touch the camera during shooting. It also means you can lift up your head and smile to encourage your portrait subjects. You will be amazed at how relaxed this can make them look. Otherwise use an off camera shutter release button often attached by a short cord. A tripod spells professional and at a wedding where everyone has a camera of sorts it identifies you as the official photographer. It will also keep other photographers from invading your space in an attempt to steal the attention of your subjects. Thirdly it will slow down the process and make you think more about your composition.



As you can see a tripod is more than a form of support at slow shutter speeds. Another pod is the monopod, which is often seen on sports sidelines to support large aperture telephoto lenses. They are easy to move around and extend to the all important eye level. A sports photographer will be using one to reduce fatigue and RSI, which can come from holding a heavy camera and long lens over a period of time. It will take the weight off your back. I have personally suffered from tennis elbow caused by heavy cameras in my less attentive days. It can take a long time to come right, so it is best to be avoided by using a pod. Tripods come in all sorts of price ranges and I choose to use the average models with the plastic heads. I would rather spend my money on better glass and replace a tripod in future years if need be.

Next we will have a more detailed look at exposure and how it works.

Chapter 4: Exposure and how it works

A correctly exposed photograph will be one where the optimal amount of light will fall on the focal plane. Exposure on to film will create an image just as it does in for each individual pixel on our digital CCD. Too much light and the highlights will be blown out and the picture will be washed away in white light. Too little light and the image will be dark and less colourful. Correct exposure is a balance between shutter speed, which lets light in over a period of time, and aperture, which is a hole that depending on the size, will allow more or less light to enter the light tight box on our camera. I know you already know this, if you have come this far with this ebook.

Let's go on and enjoy a more detailed explanation

4.1: Shutter speed

A shutter is a physical or electronically controlled curtain, which opens and closes. Front curtain is the pulling back of the shutter and rear curtain is the closure of the curtain. Measured in seconds or part thereof as a fraction, speeds up to 1/4000 of seconds are possible in modern SLR cameras. Bulb shutter speed means the shutter will remain open for as long as the shutter release button is held down. This is very desirable when shooting star trails over thirty minutes or more. A tripod and a remote shutter release are essential for star trails.

The longer the shutter remains open the more movement will be imprinted onto the image. Speeds essential to freeze motion depend entirely on the focal length of the lens. A focal length of 50mm will only require 1/50 of a second while a lens at 300mm will require 1/300 of a second for the same subject. A good average for a versatile and safe shutter speed is 1/250 and can be achieved in good light with medium apertures up to 200mm in focal length. A slower shutter speed will also bleed in more colour saturation. Here is a table of shutter speeds at normal focal length of 50mm (the angle of the human eye)

1/15th of a second	Use a tripod to prevent shudder blur. Will blur water in a waterfall. Will bleed
--------------------	--

	in more colour. You may have to use a Low Density filter to block light in bright conditions
1/60th of a second	Safe to hand hold with care and shoot subjects that are still or near motionless, such as a carefully posed person
1/125th of a second	Will freeze movement in slower moving subjects and a good speed to shoot when panning fast moving subjects with the affect of motion blur in the background
1/250th of a second	A medium speed at mid apertures depending on the available light. A good default speed when you put your camera to bed
1/500th of a second	High speed will freeze most action including raindrops. Most flash systems will only synchronize to this speed in burst mode
1/1000th of a second	High speed will freeze most action. Your flash will not synchronize at this speed. Larger apertures can be achieved at this speed.

Very slow shutter speeds at over 1 second to 30 seconds are useful for night photography where we may want to create headlight and taillight trails from vehicles on a busy road.

4.2: Aperture

An aperture is a hole in a lens, which can be controlled. The larger the hole the more light will reach the focal plane. The size is measured in f-stops and this is where it can get confusing. The larger the hole the smaller the f stops numerical number. The term 'stop' comes from the days where a photographer would place a physical

stop into a lens to decrease the aperture. To stop down a lens in today's terminology is to reduce the size of an aperture.

The aperture size and range depends on the quality of the lens f4.5 to f22 is typical of a consumer brand lens and is known as slow glass.

f2.8 to f44 is typical of professional branded lenses and known as fast glass.

The larger aperture at f2.8 is beneficial in hand holding the lens in low light.

4.3: Depth of Field

In photography the effects of aperture is apparent in depth of field. Depth of field is controlled by either focal length or aperture. The larger apertures of f2.8 will have the shallowest depth of field blurring subjects and scenery outside of the focused point.

4.4: The relationship between Shutter speed and Aperture

In any type of camera, light is focused by the lens, through an aperture and onto the focal plane. The size of the aperture controls how much light passes. In addition to controlling the brightness of the exposure, the aperture controls the depth of field in the image. By balancing the size of the aperture (as measured in f-stops) with the shutter speed you can trade off between varying depth of field, and or the ability to better-resolve fast motion.

4.5: The light meter

Modern digital SLR cameras will have advanced light metering systems as detailed in chapter one. Traditional photography saw the common use of hand held light meters to measure light and then the photographer would set the desired aperture and shutter speed to create a correct exposure. This is still done sometimes.

4.6: Exposure compensation

Modern SLR cameras will have a convenient dial to stop up or down exposure compensation by increasing or decreasing aperture while keeping the shutter speed constant. The basic effect is to brighten or

darken a composition by over or under exposure. Where would you use it?

Positive compensation is desirable when the subject is darker than the background. Such as when a portrait subject has his or her back to the sun or a bright reflecting back drop.

+ ---| - Typical viewfinder with positive compensation applied or the scene is over exposed

Negative compensation is useful when the subject is brighter than the background and is facing the direction of light. In digital cameras this is especially important as many cameras have a tendency to blow out the highlights in contrast situations making our subjects washed out. Negative compensation will reduce this.

+ |--- - Typical viewfinder with negative compensation applied or the scene is under exposed

4.7: Introduction to Flash Photography

In our next chapter we will look at flash lighting in more detail but first let me introduce this most common lighting system as it affects exposure.

Most modern digital cameras will have a built in flash, which will operate automatically in auto modes and manually when selected in semi automatic modes and manual photography.



The flash unit in the camera will be good for up to four meters depending on the unit and will be very directional down the line of the lens. This can make it undesirable in professional photography.

Digital SLR cameras will probably have a hot shoe on top where a portable flash unit can be attached. The advantage of the larger flash unit is that it is directional and able to bounce light off walls and low ceilings and it can also be used off camera as a remote unit depending on the model. They are also much more powerful and will throw light for many meters in the right conditions.

Flash lighting has the effect of simply throwing more light into a composition, illuminating subjects, increasing the required shutter speed, and decreasing the aperture required to correctly expose the photo. They can also be used in a variety of ways to create pleasing images, which we will focus on later.

Chapter 5: Lighting Systems

5.1: The Flash Unit

Flash units can be driven from the camera body and synchronize with the shutter to balance the exposure. It is the way we use the flash that will either give us poor or pleasing photography. This is important!



5.2: TTL Fill Flash

TTL stands for Through the Lens and fill flash is a technique often used in portraits to fill in shadow. Light on a subject's face will match the exposure required for the background. The camera will vary the amount of light from the flash unit. Very useful on sunny days when you don't want your subject squinting into the sunlight. Correct fill flash will only be enough light to fill in the shadows without blowing or washing out the subject. The eyes are said to be the pathway to the soul and a little flash or lighting will also provide a pleasing glint in the eye. The trick is not to use too much flash.

5.3: Flash compensation

We can choose to dial in more or less light from the flash unit depending on what we are looking for. If you are rather close to your subject and you only want a little light to bring in the detail then it is a good idea to use negative flash compensation. The opposite may apply if you are well back and need to properly illuminate a group.

On manual mode the distance flash will penetrate all depends on the size of the aperture. The shutter speed is irrelevant because the burst of light from a flash unit is often a lot faster than the shutter. You can choose to dim the flash in a fraction of its normal intensity from $\frac{1}{2}$ to $\frac{1}{125}$.

5.5: Diffusing flash

Light from a flash unit is too directional and harsh, with the results being hard shadows created by the flash. This is especially so in portrait photography. To counter this you can use a diffuser or reflector over your flash head to break up those light rays. This has a similar effect to clouds over the sun. Notice how the clouds fill the shadows with diffused light and tone down the harsh rays of direct sunlight, making for very desirable natural lighting for photography. We can simulate this in flash photography using a diffuser which will break up light casting less shadow. A reflector will redirect the flash to the required direction making for less shadow again. I choose to use a reflector above a flash head to cast pleasing light into a portrait composition. The flash hood is very useful for wedding and fast moving photography but it also has one more desired effect. It is far more comfortable for your portrait subjects because the flash is less dazzling when it is bounced off a reflector.



You can achieve similar results with natural light by reflecting light into shadows using a piece of white card or a professional circular reflector. You will need an assistant to hold the reflector. The downside to this it can dazzle your subjects. A reflector like this is often used in studio photography or temporary lighting setups.



5.6: Bounce flash

In an enclosed room you may diffuse and alter the direction of the light from a flash unit by rotating or tilting the unit to bounce light off a low ceiling or the walls. This can be useful in portrait photography where time and space are not available to you but plenty of walls and ceilings are. Watch the colour of the walls, as the colour will reflect along with the light creating a colour casting.

5.7: Red eye

Red eye is common in portraits in particularly low light situations. The person's pupils are wide and open allowing the flash to penetrate the eye and reflect off the retina at the back of the eye. You are literally seeing the red blood vessels in the back of the eye. This is common in on camera flash photography and is not a desirable effect. Camera manufacturers have come up with one method of reducing and eliminating red eye and that is a pre-flash which closes down the pupils before the main flash and the shutter release. The down side to this is that often the subject will assume the photo has been taken and turn away from the uncomfortable bright light.

Another way to eliminate red eye is to use a diffuser and use a remote flash unit mounted off camera. The light direction will not be down the lens and the retina will not reflect light back to the camera lens. A flash hood reflector is also useful as it raises the flash above the line of the lens.

5.8: Remote Flash Units

The advantage of many modern flash units like this is their capability to run in remote or commander mode. This means the camera body will send a flash out to the remote unit and trigger the remote flash mounted on a tripod. Some camera systems will allow up to three flash units to be arranged in this way. I find one is more than enough to handle and gives pleasing lighting from a desired direction. A 45-degree angle from the camera and the subject at the same distance to the subject is often desired. You will have good quality portable and directional light.

5.9: Slow sync flash photography

One of the desirable effects of flash photography comes from a burst of light, which will freeze motion. If we want to correctly expose the background in low light we may need to leave the shutter open longer to let in enough light in places where the flash will not reach. You will need to use a tripod.

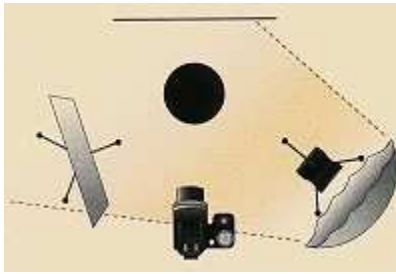
The flash can burst on the opening of the shutter, called front curtain slow sync or on the closure of the shutter or rear curtain slow sync. The artistic value of this is that motion can be frozen in time during a time-delayed composition leaving a pleasing trail of movement behind a subject in motion. Moody creative flash photography will result.

I hope I have enlightened you on the virtues of our most available lighting system in flash photography. We can now look at common lighting systems in the studio.

5.10: Basic Studio lighting

Previously we looked at the virtues of flash photography as a means of portable and versatile lighting in the field. Let's now expand on this and look at studio lighting. Lighting of this nature is desirable in situations when you have plenty of time and a location to set up lights for the perfect results. You may have seen umbrella reflectors? Well the purpose of these is to simply diffuse the light and break up the direct rays making for softer light with fewer shadows, same as the flash hood reflector.

This is a typical studio lighting set up...



The big difference between flash lighting and studio light is the later is turned on continuously so you can see the results you are going to get and not rely so much on seeing results after the shot is taken.

A studio set up of lights can be as complicated and creative as you want it to be. Sometimes coloured gels are inserted over lights to create coloured compositions and the like to suit the photographer's creative desires.

The above diagram is a main light to the right reflecting into an umbrella and a reflector on the left to bounce some of the light back to fill in the shadows with less intensive illumination. The result is a well-illuminated subject with a more natural look.

5.11: Backgrounds

Depending on where you position your lights and your subject, will result in the background being illuminated or not. The idea is not to cast strong shadows on to the background which is where the reflectors come in handy. You will also need a background of sorts, it may be a large cloth or a roll down screen.

You can purchase or make background cloths in a variety of colours. Don't go for strong patterns or bright colours, as it will only detract from the subject. Grey backgrounds are very versatile. You can always illuminate the background with coloured lights if you wish. This is an example of remote strobe being used to illuminate a coloured background behind a portrait subject...



The illumination on the subject face came from natural light from an adjacent window.

5.12: Natural light

Natural light still remains the most available light we can use with the desired northward facing window offering wonderful lighting. A reflector can be used to bounce some of this light back on to the subject to fill in shadows. I often find that a combination of lighting and natural light offers the best results in my portrait photography. Direct sunlight is to be avoided, if possible, as it creates harsh shadows.

5.13: Studio apparatus

The pro studio photographer will have all sorts of contraptions to create his or her images. We have seen how umbrellas and reflectors are used now let's look at some of the others.

Ringflash is a favorite with fashion and beauty photographers as it casts an even, direct light.



Softboxes offer a soft and diffused light source and can be large. This full-length softbox is used to illuminate head to foot in model photography.



Blowers are used to create wild and wind blown hair in fashion photography.



A snoot narrows down a light beam to create very directional beams. Barn doors are also popular. A device called a honeycomb is also used to alter the effect of snoot light.



A dish creates hard shadow effects.



The types of light bulbs most commonly used...

5.14: Tungsten lights

Provides specific colour temperature light at a fairly even rate. The two types of illumination, which are most popular, are 3200 degree Kelvin and 3400 degree Kelvin. Daylight and flash colour temperature is 5500 so a shot set to daylight white balance or daylight balanced film will give a red colour casting. See chapter 1 for more information on white balance and converting filters used on film cameras. They work in the same manor as a domestic light bulb making them the most popular lighting for studio photography. They can get very hot so take care when using them close to reflectors and other flammable material. They also burn out quickly with 100 to 200 hours being typical and a bulb can cost up to \$30 so don't waste them by leaving them on unnecessarily. The big advantage is they are quick and simple to use.

5.15: Halogen lights

Originally developed for video cameras for the film industry they are also well suited to studio photography. Faster shutter speeds and smaller apertures are possible because they are much brighter then tungsten at the same wattage, and the light produced is much closer to daylight in colour temperature. They also last a lot longer but are more expensive to replace and buy. They are a lot more efficient on electricity than tungsten lights but there are fewer accessories available for them. Whatever lighting you use you must treat it with utmost care. They are easily damaged and sometimes are the cause of fires.

Now we have taken our photo we will need to transfer our photos to the computer and then undertake postproduction work. This was once the common domain of the chemical darkroom. Now we use software and computers. We will study this next.

Chapter 6: Image Editing Software

In the days of film the professional and the keen amateur photographer would spend a lot of time in the dark room working with chemicals to create wonderful photographs. The developing labs seen all over the world were established and developing film became easy and affordable. In recent years we have seen the advent of digital photography and huge changes in the way a photographer deals with images. A digital computer and a good colour printer have replaced the dark room.

We can now do amazing things with images by spending time in postproduction using advanced software packages.

If you want to be a professional photographer in today's market then a good understanding and confident use of software is essential. For every hour you spend taking photos you can expect to spend at least that in postproduction. Don't be too disheartened by this! The process and results can be just as satisfying as the shoot and this is the only practical way of looking at it. Besides, would you rather spend as many hours in a dark room working with potentially harmful chemicals? I am very pleased it has gone in this direction.

By far the most common software and the most advanced is Adobe Photoshop. Used in professional labs all around the world it is industry standard in photography and graphics manipulation.

Another package is Corel Paint Shop Pro, which is also popular and a lot cheaper than Photoshop. It can do most of the things Photoshop can do but it does lack a few advanced features such as actions, which I find very useful. My advice is to use and learn Photoshop if your budget will stretch.

There are many other packages that come free as bundles with digital cameras but the feature that is of most use to us is the ability to work in layers. Both Photoshop and Paint Shop Pro have a layers pallet.

For this tutorial I will look at the very basics of Photoshop that are useful to photographers. If you want to learn more then I suggest you

purchase the latest version of the software and experiment to your hearts content. Don't forget your family may not recognize you after you get your head lost in the creativity it can offer. Photoshop is also very useful as a graphic design application and some people even become so savvy that they can create wonderful digital artworks all on the computer. There are some differences in the operation of the software between Macs and Windows but for the purpose of this tutorial we will focus on the most common operating system, which is Windows. The latest Adobe Photoshop is simply an essential tool for professional photographers. Adobe Photoshop Elements is less expensive and suited to many users.

6.1: File, Formats and Resolutions

There are a number of file formats that are useful to photographers depending on intention of use. All of these files can be opened and manipulated in Photoshop. Firstly let's look at the program's daughter file or the Photoshop file, identified with this extension after the dot (.PSD)

PSD is a Photoshop file and holds image and data information important to all the features of Photoshop. Saving in this file format will hold layers and selections intact so they can be worked on separately. If you intend making future changes to your files then this is a very useful file format. Most print labs can also print from a PSD file. The memory size measured in megabytes is large (5 -50 Megabytes for high resolution) so Photoshop files are not easily transferred over the internet via email or posted on websites. Some other graphic applications will run and manipulate Photoshop files but you are best to use the mother program of Photoshop.

JPEG (Joint Photographic Experts Group) files are very universal and have fast become industry standard for print ready files in most labs, mainly because of the low memory size meaning they are easily moved around the world. They are also standard for images posted on websites. JPEG files are compressed and therefore small in file size. (2 -5 megabytes for high resolution at high quality). JPEG files should only be resaved a few times as images data is disregarded each time depending on the compression levels selected. We will

look at this in more detail when we cover optimisation later in this chapter.

TIFF files are short for Tagged Image File Format. Similar to JPEG files these files can be compressed to create a more manageable file size. About twice the memory of an identical JPEG file. The big advantage of TIFF is that all image data can be retained each time the file is resaved. This file is also industry standard in print labs and graphic design companies. If your photos are going to be further processed or added to documents in a design house then the files are better to be sent as TIFF files and burnt to CD if your Internet speed is slower.

So what is the best file to use for prints? Frankly there is little or no difference the human eye can see on good RGB printers. If all file formats are of high quality then you won't see any difference unless your eye is super trained. Yes that's right! A fifty-megabyte PSD file can print the same as an identical JPEG file, which is only three megabytes. The most important thing to consider is shooting well-exposed original photos at a high resolution.

Resolution can be confusing. It is best described as the number of pixels in an image. A pixel is a tiny square, which the computer assigns a 6-digit code, which corresponds to a colour. They make up your digital photo like pieces of a jigsaw puzzle. If the pixels are numerous enough then the human eye will blend them with gradual mixing of colour and tone. You may have heard of DPI? Well this stands for Dots per Square Inch or pixels per square inch PPI . Most printing labs will print your photos at 200 to 400 DPI and it pays to know what they do. At these resolutions the pixels will become blended to the human eye at hand distance on quality paper. The massive billboards you see are printed at very low DPI because they are viewed at a distance. Come in close to the billboard and you will easily see the dots or individual pixels. Four Colour Printing or CMYK needs a much higher resolution (300 DPI) and a better quality file than the typical Laser and Ink jet RGB printing methods in smaller print shops. Again we will look at these printing methods later in this chapter. It is important for you to have a good understanding of how your photos are going to be printed. If you are a professional then visit a large print house if you can and talk to the managers about

printing digital files. Your screen resolution is also measured in pixels, but because light is coming out of the screen rather than being absorbed and reflected by a print the resolution can be much smaller. 72 DPI is standard for your typical monitor resolution.

We can now see that resolution can be used to express the total number of pixels in our file such as six million (3000 x 2000) pixels or it can be used to express the total number of pixels in each square inch of our photos (DPI and PPI).

Resolution has a direct bearing on the size of your print and the data memory consumed by the file. The measure you should become accustomed to is the pixel length of the longest side of your file. From here you will soon get an instinctive idea of what is required from your photo files. For example:

150 pixels wide	Adequate only as thumbnail images displayed on the web
720 pixels wide	Adequate for full size files displayed or emailed on the web and for small proof prints less than 4 inches wide
2000-2500 pixels wide	Adequate for fair quality prints up to A4 in size or 8-10 inches.
3000-4500 pixels wide	Adequate for good quality prints above A4.

6.2: Screen resolutions

The ever-expanding screen resolutions are governed by the demands of larger and more defined monitors. We simply count the number of pixels on screen the same way as the resolution of our photos. The difference is the DPI or Dots per Square Inch. 72 DPI is currently the standard monitor resolution. Colour becomes blended to the human

eye above 72 DPI when the image is transmitted in a light source such as our monitor.

Most monitors are now over 1200 pixels wide but an original high-resolution photo file can be over 3000 pixels wide. You can view the actual pixels in Photoshop to see the image at full size on monitor resolution.

View - actual pixels

You will see it is huge.

Photoshop will also let you see the actual photo at the standard 300 DPI print size.

View - print size

Now you should have a good grasp on resolution and how, it relates to your original files, monitor display and the output print size. Lets now go and manipulate our photos in Photoshop.

6.3: Basic Images Adjustments

Once you have opened a photo in Photoshop you are able to make adjustments to the image in many ways. Allow me to introduce just a few of them. Firstly you need to know how to reference the tools. I have included some simple steps shown in italics starting at the task bar at the top of the main Photoshop window. Example...

Window - show tools

Will bring up the tools window. Photoshop is an ever expanding program and new tools are being added all the time with every new version. The basic ones we are interested in for this tutorial have been in place since the early days of the application.



The first major tip I can give you here is to always work on copies of your original photos and leave the original intact.

Image - duplicate

The changed image can be saved later or at any stage. Save it as a PSD file if you want to make further changes to the photo.

Now let's reference the adjustments you can make. Click on the image tag on the main task bar.

Image size is a good place to start and is commonly used to decrease or even increase the resolution of a file thus adjusting the pixel size.

Image - image size (your desires)

When decreasing the size of an image, be sure to sharpen it because it will have softened just a little.

Filter - sharpen

You can also increase the size of a photo resolution to make a bigger print, Photoshop does this well. Start with a good clean photo file with little grain. (Shot at a low ISO) The process is called pollinating and literally adds pixels based on what is around them. You can increase the size of a clean file by as much as 100% and get a wonderful print from it but I only go as high as 50% and only if I really need to. Doing it in small steps seems to work well but there is some argument that you don't need to. An original 3000 pixel wide file can easily be taken up to 4500 pixels, which is a professional standard shot for a high-end DSLR camera. Working from RAW files will give better results. I don't want to confuse you just yet so I will cover RAW formats and converters later.

Following the image adjustment path opens up another vast selection of possibilities.

Image - adjust

Let's look at the channel mixer

Image - adjust - channel mixer

This is useful for creating excellent monochrome or black and white photos. Tick the monochrome box and adjust the RGB values until you get what you want. If you intend printing this black and white file then make the image a grayscale and thus throw away any of RGB information. Why? Because some printers will try and sneak in some colour information embedded in the file resulting in a slight colour casting to an otherwise clean black and white photo.

Image - mode - grayscale

One more thing to note is the bit size of your photos. You only need to work in 8 bits. The other option is 16 or 32 bits but will result in double or triple the file memory size with no difference to quality distinguishable to the average human eye.

6.4: Basic Filters

By clicking on the filter tag you will see a large number of Photoshop

plug in's that will make all sorts of wonderful effects to your images. The artist in you will be fulfilled beyond your wildest dreams. For the purpose of very day use the most commonly used filters are Blur and Sharpen.

Sometimes an image is just too sharp, especially in Portraits where skin defects can easily be seen. A simple softening may be all that is needed.

Filter - blur - blur or blur more

Now you see lots of other types of blur available.

Gaussian Blur has the same effect as shallow depth of field and out of focus. Sometimes I like to draw a selection around a subject and blur the background. The use of selections is required and we will look at this soon.

Filter - blur - gaussian blur

Motion Blur has the effect of panning directional movement through the frame simulated in camera with a suitable shutter speed. Very useful to show action and make those waves literally wash up on to the seashore in a very pleasing seascape.

Filter - blur - motion blur

Sharpening is the most commonly used filter but it should be used sparingly and the last thing in the manipulation process. Over sharpening or altering an image after it has been sharpened can degrade image quality with the contrasting edges the first to show. It is impossible to fix an out of focus photo with sharpening so throw them away and focus properly in camera.

The simple sharpening function is useful when you decrease the size of a photo to counteract the softening of pixels.

Filter - sharpen - sharpen

Unsharp mask is most useful because of the control it gives you in the sharpening process. A confusing name I know but it does a very

good job of sharpening. An amount of 100% at a radius of 2 pixels seems to work well on high-resolution images.

Filter - sharpen- unsharp mask

Adding noise has the same effect in camera as a high ISO setting in low light photography. A grainy photo will result. This is a common artistry effect in Black and White photos.

Filter - noise - add noise

Whatever filter you are applying to your photos make sure you are working in the correct layer. Let's now have a close look at Photoshop layers.

6.5: Working in Layers

The most useful thing about working in Photoshop and in other graphics programs, which are capable, is Layers. Layers are images or effects literally stacked on top of each other in a logical order.



Window - show layers

A handy window will show you which layers you have available and offer layer options...

From here you can select the layer you wish to work on and then.

- Hide Layers
- Copy and duplicate layers
- Add layer masks
- Adjust opacity to make semi transparent layers
- Delete layers
- Drag and drop layers.

One major tip I can give you here is if you make a change to a photo and you can't see the result then you are most likely working in the wrong layer. Check the Layers window. Highlight the correct layer and don't forget to reverse your mistake on the wrong layer.

You can reverse a mistake by dragging the step to the trashcan in the History Pallet.

Window - show history

Layer masks are another wonderful feature of Photoshop Layers. A little more advanced but you are advised to research this. Once you get a handle on masks all the power of Photoshop will open up to you.

6.6: Working in Selections

Selections are a most useful tool of Photoshop. You can select all or part of an image for manipulation. A selection is identified by a dotted marquee line and can be inserted in a number of ways. Firstly you must make sure you have the tool pallet visible on your screen.

Window - show tools

Open a photo and try making a selection using the selection tools.



The rectangular selection tool gives you the option of pre-selected shapes such as a rectangle elliptical or others. Right click (windows only) on the bottom right corner of the toolbox, the tiny little arrow.

This will give you all the options of this tool. Other options of this tool are shown in the top horizontal tool bar just under the main menus.



You will notice a setting called Feather? This variable setting results in a faded edge around a selection and is useful for pasting selections cleanly into other images or areas of the same image.

If you need to de select a selection and delete the marquee do this...

Select - de select

The Polygonal selection tool is on the tool bar.



This gives you the option of free hand selections and point-to-point selections.

The magic wand tool



Automatically creates a selection around a defined area along areas of contrasting pixels.

Inverting a selection is useful when you want to draw around and then isolate part of an image.

Select - inverse

There are many other features in Photoshop associated with selections.

6.7: Cropping an Image

The crop tool is the most used feature of any graphics program and commonly used in Photoshop.



By cropping an image you are reducing the pixel size and the overall maximum print size of the file. Don't drastically crop a photo if you wish to make larger prints from it and always work on a copy of the original file.

Simply select the tool from the tool bar and then drag out a crop marquee on the photo and then double click to crop. It is useful for consistency if you maintain the original aspect ratio. Drag the crop marquee and the whole photo, hold down the shift key and then drag the marquee thus holding the exact shape.

6.8: The Clone Stamp Tool

This tool provides us with a quick method of copying selected adjacent pixels in a photo and pasting them over another defined area of the image. Very useful for cloning out blemishes in the photo.



Alt click to define the source area and then click and drag to carry those pixels over. Notice how the source area moves with the mouse.

Another very useful tool is the patch tool, which does a similar thing to the clone tool but works with a selected marquee area. The clone tool is often used in conjunction with the patch tool in photo retouching

6.9: Inserting text into photos

A new text layer is created when you insert text into a graphic.



Clicking on the photo will position in a curser and you can now select the font options. The available fonts in your system will be available as they are in all the other text applications you work with.

Once a text layer has been made you can move it around with the move tool and change it like you would any other layer. You can even set the transparency options if you wish. The move tool is...



Once you have created your text on a photo you are best not to reduce the size of the photo because I find this degrades the text. You are best to resize the photo before you place the text on it and then save the final result.

6.10: File optimization for print and web

Files for Websites...

The desired outcome when optimizing files for the web is to give you the greatest quality image on screen with the least amount of memory size. A compressed JPEG is the industry standard format.

File - save for web

This will bring up the optimization options. By reducing the quality of the photo you are compressing the data and the file memory size. Try this to its extremes and you will see how the preview image has become blotchy around contrasting areas on the photo. This is called JPEG artifacts. This is why JPEG files should only be saved a few times even at high quality. By resaving you are further degrading a compressed file and adding to the visible artifacts.

If you are emailing this compressed JPEG file on to another party who will in turn resize it and resave it for a website project, then you are best to find out how large they want it in pixel size and then save it at the highest quality.

A designer can now further manipulate the photo and resave it down to under 100k for inclusion into a website.

Files for print shops...

If you are sending a file to a print lab via email then you can safely send a high quality JPEG file with a small amount of compression. Printing results in modern RGB labs are excellent. The average human eye can't tell the difference between a high quality JPEG, a TIFF or a Photoshop file even though the JPEG file is less than half the memory size and much easier to email on a broadband connection. You can resize the photo if you wish by asking your client how big they intend to print the file and at what resolution.

File - save as - JPEG options

If you are destined to burn the file to a CD or copy it to a portable drive then file memory size is not such an issue. If your client is going to further manipulate the photo then sending them a TIFF file or a top quality JPEG file is the best option. This is especially so if the printing method of the file is destined to be CMYK or offset printing.

6.11: RGB and CMYK printing methods.

As we develop as a photographer it helps if we have a good knowledge on how our photos will be printed.

RGB

RGB stands for Red, Green, and Blue and uses three colours. The printing machine will blend these colours to create the various colours in our image. These printers may be Ink Jets or Laser printers. Some printers require a pre blend of the three colours to introduce six colours into the process. Our small print labs will be using RGB printing machines.

CMYK

Much larger, faster machines are in large offset print shops such as a newspaper and magazine press. These use the CMYK plates in an offset printing method. CMYK stands for Cyan, Magenta, Yellow and Key (Black). Four actual plates are made and then stamped on to the

paper thus transferring the four colours, which then blend on the media. An offset printing press will quickly produce many thousands of copies. Offset printing is much cheaper in large runs than the more convenient RGB method mainly for smaller print runs.

So what is the file standard for each printing method?

Well, all the original file formats are OK for both with RGB methods being the most tolerant to over compressed or poor quality files. CMYK does not produce good results from poor quality files. Artifacts around areas of contrasting pixels will be apparent. If you are sending files for Offset printing then send them a high quality JPEG file or a TIFF file. Some more advanced photographers may choose to change the mode of the file to CMYK to save the client having to do it and for more advanced manipulations. Probably not necessary.

Image - mode - CMYK colour

6.12: Colour balance, Curves and Gamma

Colour Balance

Firstly open your photo file and make sure you have the correct layer highlighted in the Layer window. Open the colour balance options window

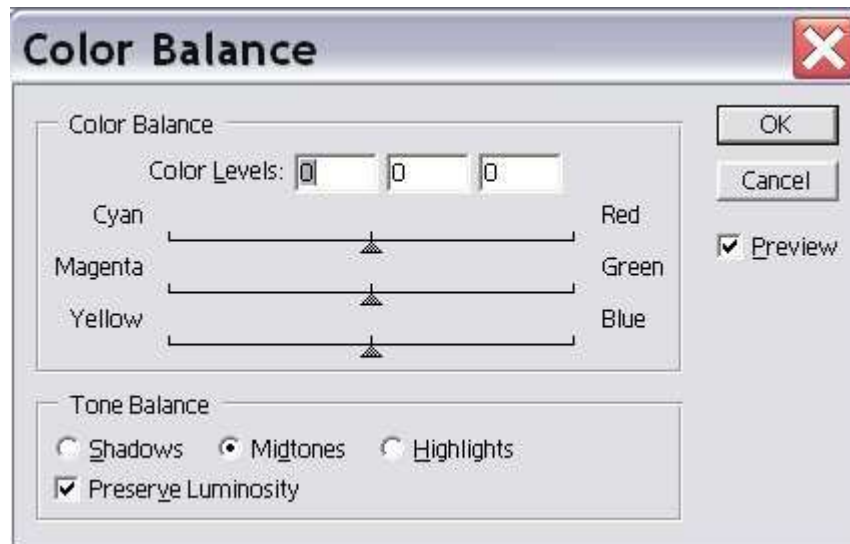


Image - adjust - colour balance

Correction of blue or red colour casting is easy by applying opposite colours. Pump some red into an otherwise cool blue photo resulting in more natural colour.

Curve Graphs

Curves are a versatile way of adjusting contrast and gamma. Learning to use them well can significantly improve your photos and effects.

Firstly open the curves graph window

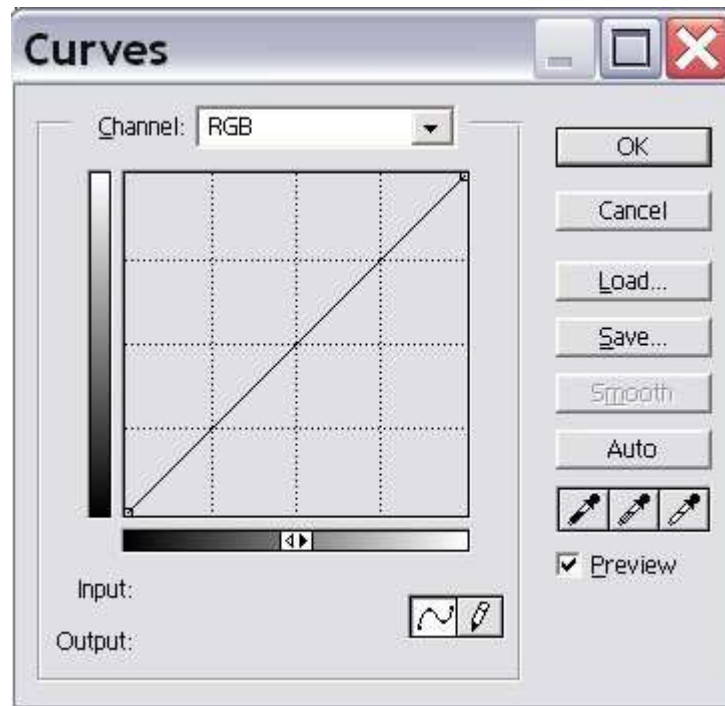


Image - adjust - curves

The best way to see what the curve can do is to experiment with the extremes.

In Photoshop click on the line in more than one place. Now drag the line to create the curve and alter the tone of the image.

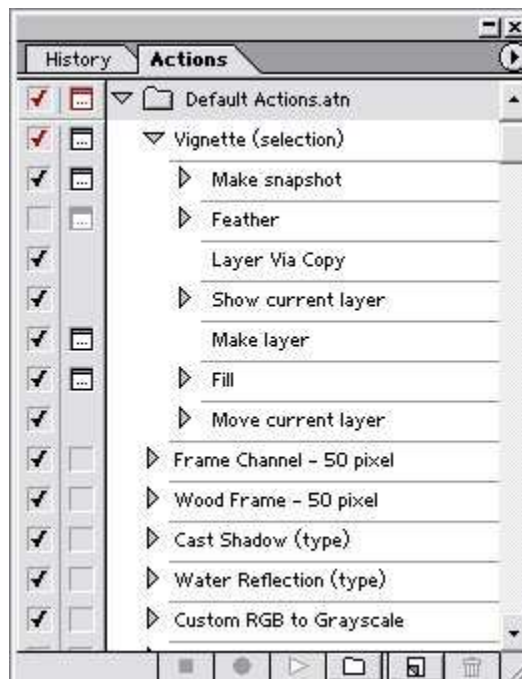
Gamma is a term used to identify intensities of mid-tone in an image. The increase of gamma in a curve will immediately improve dark photos.

On the curve graph the gamma point is midway between highlights and shadow. Click on this point and slope the curves graph up to increase or down to decrease the gamma.

6.13: Actions Recording and Batch Conversions

Photoshop actions are a favourite feature. They result in time saving automated processes. Imagine you wish to do the same thing to eighty photos. This may be as simple as resizing them and saving them to upload to a website. Doing each one individually can take hours. By creating an action you can record what you are doing to one photo and then play it across an entire folder. You can save this action for future automated batch conversions. Photoshop has many pre-programmed actions installed. such as sepia tone. I recorded actions to create the borders and signatures on my web files. So how we harness the power of a Photoshop action? Easy!

Firstly become familiar with the actions Pallet.



Window - show actions

To create a new action firstly open a required photos file. Click on the 'create new action' icon on the actions window. Name your action and press record. Whatever you do will be recorded so sometimes it pays to practice first before you start recording or your mistakes and corrections will also be recorded.

Recordings should include saving to a desired folder and closing the original image without making any alterations to the original file.

File - save as then close

If you don't close then Photoshop will leave it open on a batch conversion and do the same with all the files in the folder. When you have finalized what you want to record, click the stop button at the bottom of the actions window.

Now let's test the action on another image. Open a photo and select the action from the list in the actions window. Now click the play button. You can see the action run each step of the process in order. If it works then you can now play your recorded action across an entire folder of images. How?

File - automate - batch

A window will open. Select the required action, the source folder and then the destination folder. You can also override the save in folder and select a different destination folder.

Click OK and sit back and watch all those saved hours of repetitive work zap away in front of your eyes. It's a mighty fine thing!

If you are new to actions then be prepared to spend some time experimenting and learning. Also you can Google thousands of free Photoshop actions that are available on line. Simply save them into your Photoshop actions folder. Make sure they are legit by running that virus protection software across them as you download them.

Enjoy those actions.

The next part of this tutorial looks at colour management and screen optimization. Helping see on your screen what we will get from your prints.

6.14: Colour Management and screen calibrations

Let's look at colour management as it refers to ICC profiles, working space and monitor calibration.

The only device we can preview our images on before they are printed is our monitor. If what you see is what you want from your prints then you are going to have to colour manage your workstation and your workflow. This process is called colour management.

Colour management is a system of matching colour between viewers and printers anywhere in the world. Creating predictable colour in a stable environment. But what is a stable environment? The lighting in your workroom is a good place to start and should be 5000 degrees Kelvin, which is by no coincidence the colour temperature of diffused daylight (not direct sunlight). Ask your lighting shop for such a bulb. Use a good quality screen monitor and graphics card in your computer by asking your computer store what the professional graphic designers and photographers are using. You can also research the information from your society or photography institute. It does pay to be a member of a supportive group or club.

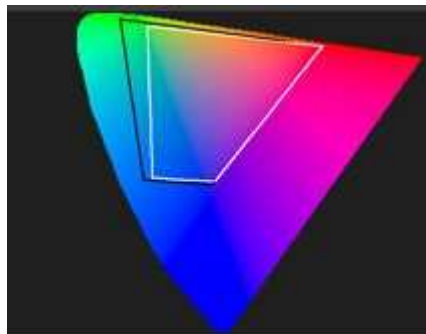
Correct colour management will mean much better images by creating consistency in devices. Devices such as monitors and printers will always produce colour differently if we don't use profiles to bring them back in line.

Profiles are files that sit in your system folder and are small text files. Monitor profiles are used automatically; scanner and printer profiles can be manual or automatic.

A group of international industry experts saw the problems the new digital equipment was causing and developed the ICC profile specifications. ICC stands for International Colour Consortium. Colour management today generally refers to ICC Colour Management. Photoshop was the first to use ICC profiles and from version 6 has led the way. All graphics software is now ICC compliant.

Before we get down to the practice of colour management it is important to understand working space and colour gamut.

The range of colour that can be read and viewed from a file is called Gamut. The naked eye, the monitor and the four-colour printing press all have different gamut. The eyes will see the widest gamut while the four colour printing press has the narrowest gamut. There are two main generic colour spaces in use today and you are going to come across them in digital photography. One is called sRGB, which is used, on the Internet and in many print labs. This colour gamut is a useful standard. The most recent is Adobe RGB 1998, which many graphic design companies use. Adobe RGB has a wider colour gamut particularly for those images extending into the greens and cyan's. It is important to realise there are no more colours crayons in the adobe RGB, only the box is bigger. The sRGB format has the same amount of colours only they are more tightly packed together. Also a RAW file as shot in camera has no assigned colour profile. You assign the profile when you convert the files in RAW conversions software such as lightroom.



The above comparison shows adobe RGB outlined in black and sRGB in white.

As a general rule of thumb I shoot in RAW and convert to the Adobe RGB colour space if the file is destined to for graphic design companies or sRGB if it is going to portrait labs for photographic wedding prints. The adobe colour space is better if you intend extensive manipulating and changes in Photoshop, after all the colour space was developed by the makers of Photoshop. An adobe RGB print will look flat if it is converted to sRGB which is what some printers will do.

My own experiments concerning colour and file conversions.

I am not one to listen to the so called experts on the great adobeRGB vs the sRGB debate so I did a little experimentation to test my print outputs. I will keep this page up to date on my future experiments. I am not saying my advise is gospel, rather what I have discovered in control experimentation.

I took my files to the Harvey Normal (large department store) kiosk printing machine. The reason being that these are the sort of machine most likely to be used by my average portrait photography clients once they have the files to print from.

I tested a file that was converted to Adobe RGB direct from RAW vs an sRGB file after it has been converted in Photoshop and was once an adobe file.

Result. The Adobe RGB files was so much nicer. Much more saturation and contrast. I was not expecting that.

Next I took more files to the same Kiosk...

Adobe RGB converted from the RAW file vs sRGB as converted direct from the RAW file.

Result. They are both the same and very nice prints.

Conclusion...

- > By downgrading the profile gamut and converging from adobeRGB to sRGB in Photoshop you seem to be throwing a lot of the colour (crayons) away resulting in a poor quality print. You are best to keep consistent through the shooting process which ever profile you use.
- > The Kiosk Machines are printing to the assigned profile and not converting to lesser gamut profiles. We do know this is not the case with some printlabs as they convert to sRGB and do the same as Photoshop would.
- > To be safe convert direct to sRGB from RAW only covert direct to adobe RGB if they are destined to a professional lab or a graphics company only.

- > Conversion direct sRGB is the safest way to deal with files if are going to be giving them to anyone else.
- > Most graphic software defaults to sRGB as the working profile. If this is the case an adobeRGB file would get downgraded if they are manipulated in any way. Watch your own working profile in Photoshop and keep the workflow consistant.

I now converted an sRGB file to an adobeRGB file in Photoshop to see if they results yeilded any interesting results.

Result. The adobe file seemed to be over saturated in the reds and skin tones but the file did not look flat and lifeless.

Conclusion...

> If you are going to do any gamut conversions in Photoshop then you are best to covert sRGB to adobeRGB. My understanding is both files also contain the same amount of crayons only the adobe file is spread out more over the spectrum. Hence the over saturation. The file can be desaturated slightly to bring it back into line. This is why one of my professional labs would come back to me and say my portraits were over saturated if I gave them an sRGB file and they converted it to a profile with a larger colour gamut before printing. They looked great on my screen as sRGB, I realise now it is not my screen at fault of the colour gamut. By downloading your professional printers profiles and softproofing them in photoshop you will get a more accurate picture of what your prints will look like once they have printed them.

When converting colour space in Photoshop always use the convert to profile window as this allows you to select your target.

Image - mode - convert to profile

. Every printer device has an available profile and your printer should be able to give you their current printer colour profile, which should be installed when you install the hardware drivers. In windows these profiles are located here...

Windows - system 32 - spool - drivers - colour

It can be assumed that once your screen is calibrated to match this profile then what you see is what you are going to get when it is printed. You can preview any number of profiles in Photoshop in a process called soft proofing.

Different types of paper also have unique colour profiles.

Soft proofing images in Photoshop enables you to see the results of different profiles. This also allows you to see the effects of a conversion without actually changing the files. It is important to note that each time you convert to profile you are actually resaving the file with the new profile embedded.

View - proof set ups

Simply check the proof set up and select the profile you wish to view.

I realize this is all very well in theory but how can you ensure what you are seeing is what the lab are seeing on their monitors and is it going to look the same once it is printed on your choice of paper. It is all in our monitor profiles and the procedure of setting your monitor is called screen calibration. Every screen is different in contrast, brightness, colour, colour temperature and gamma (midtones). You can calibrate your screen in one of two ways. The first is less reliable.

To set your screen by eye you will need to be soft proofing a file from your lab in the correct supplied profile.

View - proof set ups

You will also need the hard copy print on the correct paper created on your labs printer. Now match the print to the files as closely as you can. Close one eye while you do it. The colour temperature of your screen will need to be 6500 degrees Kelvin, which is direct daylight temperature, and you will need to view your print in daylight (not direct sun) and any artificial lighting needs to be 5000 degrees Kelvin.

The second most reliable method takes the guesswork out of it. It is a device that looks much like a mouse and it literally sits on your screen when taking readings. This is called a monitor optimizer. Google your options.



The device and the available software will accurately adjust your screen to the profile you select and hence creating a preferred monitor profile.

There are also companies out there and people who have made it their business to assist people in using profiles and screen calibration. Seek them out by searching online.

I do realize this is one of the most mind-boggling parts of digital photography in the professional arena but what is the point of adjusting the photos to your preferred tastes and desires when your screens are simply eluding you. You may as well give your Original files to our lab and say "You do it!" and many do just that.

Next we will look at RAW files, compare them with JPEGs and seek out software to sort and convert them.

Chapter 7: Raw Files and Raw Converters

RAW files are the true digital negatives!

The better SLR (Single Lens Reflex) camera systems can save photos to a memory card in a format unique to that make and model of camera. These are called RAW files. For example Nikon has a RAW file format called NEF.

The same SLR camera will also save files to a card in the more common and popular JPEG format in various degrees of quality and size. Most amateur photographers will be shooting JPEG files and getting satisfactory results. What is the difference between JPEG and RAW files?

Firstly JPEG files are compressed data, which means much of the file information the eye cannot see is disregarded in a successful effort to save memory space. This memory space is measured in Megabytes. If you are shooting in JPEG format then the camera has done the compression of the files for you. I suggest you select the highest possible quality and resolution because you never know how big you are required to print your file in the future.

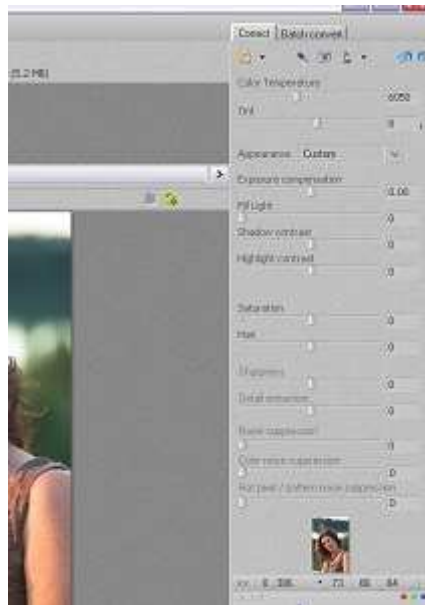
RAW files are uncompressed data and about twice the size in memory as a JPEG file. Some cameras will let you shoot in both formats at the same time, which can be handy for emailing proofs. You will want to email JPEG files of course! Why? Because JPEG files can be read on any computer while RAW files need specialist software to view and edit images.

The process of converting the RAW data has been taken away from the camera and placed in the hands of the photographer. The photographer will be using RAW conversion software to do this. But why bother if the camera can do this step? The simple fact is that you can do a lot of essential adjustments to a RAW file that you can't do with a JPEG, for example, white balance, exposure compensation and fill light. The software is designed to simplify the workflow of a professional photographer. I started my Raw File conversion workflow using Pixmantec Raw Shooter which was bought out by Adobe and turned into the amazing Photoshop Lighthouse. Raw shooter served

me well but is not being updated to work with new cameras. I was skeptical at first because of the higher price tag on Lightroom. Now I use it every day and I can recommend it to anyone. Just buy it, save hours of time and don't look back. Try it free for 30 days!

[Adobe Photoshop Lightroom: The professional photographer's essential toolbox. Purchase today!](#)

A RAW file can be adjusted in terms of exposure (EV Value) though nothing can beat a correctly exposed photo. Dark images can be brought to life. Tricky exposure compensation tweaking, you usually do in camera, can be done quickly in postproduction. White balance control is another huge advantage. It is easier to adjust an under exposed darker image then rescue an over exposed photo. Blown out highlights are white pixels and cannot be fixed without some very talented Photoshop painting work.



Another big advantage of the software is that it is very fast at processing the once cumbersome RAW files. You can also grade your photos and set an efficient workflow. This is my workflow using Adobe Lightroom.

- | | |
|----|---|
| 1. | Download the RAW files from my memory cards into a folder on my computer direct using Lightroom. I never delete or format the |
|----|---|

reference files along with the original files so any changes can be quickly accessed later if needed.

Another important note concerning JPEG files is that they should not be resaved more than twice and never over compressed if the purpose is for printing. If you do the results will be diminishing images quality such as Moiré and artifacts. When you work on your photos always work on a copy and keep the original intact, whatever format you are working in. However I have feel it is safe to resave JPEG files at high quality many times. I have tested it and I can't see any degradation of image quality. It is only when the files are saved at less then high quality, to save on memory size, that resaving becomes an issue.

Chapter 8: Types of Photography Tips and Marketing

Tired of all the techy stuff? Lets go back to the more creative side of Photography for a while and get down to business.

There are many types of photography, that inspires separate interests and requires different skills and knowledge. I will introduce you to these types and give you some tips, which I have learned and with which plenty of practice, will dramatically improve your photography.

8.1: Landscape Photography



Due to accessibility probably the most popular type of amateur photography. Professional Landscape images are always in demand but they must be excellent photos to be purchased.

Who buys them?

Publishers of travel publications, calendars and marketing agencies, for business brochures and reports. Some newspapers in general interest pages.

What should you look for?

Get walking and studying the environment and learn to watch the light. The landscape will never be the same on any given day. Avoid midday sun, as lower sun photos before 10am and after 3pm are much better. As always look for unique angles of interest and balance in the picture. For more variety capture landscapes with and without people, both vertical and horizontal shape proportions. (It can be advisable to keep people at a distance and unrecognizable for privacy issues.)

Exposure tips!

An ND or ND grad filter will greatly improve your results by evening up the foreground and the sky in the exposure. A wide-angle lens with a deep depth of field is desired. 18-70mm is an excellent lens to have. The 18-200 lens is very convenient for travel, which is often required in landscape photography.

In the composition extra saturation and sharpness is often required. You can increase the contrast in fog, which makes for dramatic images. Sunsets and sunrise are desirable and often I find some darker exposure compensation will result in a dramatic composition. A tripod in lower light is useful but generally you don't need one, as shutter speeds in excesses of 250th of a second are often achievable. Take lots of photos, as you will find very few will make the grade.

Security tips!

When travelling always keep your camera in your hand luggage and take it on the flight with you. All too often cameras are stolen from checked in baggage and this can ruin your trip. A Lowepro camera backpack is also excellent to take traveling. A steel mesh Pacsafe is

perfect for excellent security and peace of mind. Google these brands.

8.2: Portraits of People and Animals



The ability to take good photos of people or animals is a major requirement in photography. To take a photo that is much more than just a snap shot requires imagination, technical skill and personality.

Who buys them?

Newspapers are interested in photos of people in the news. Commission family photos, especially children in a studio environment. Wedding photographers are always in demand on a freelance contract. Advertising and publication agencies will often purchase animal and people images. They will be looking for model released images, meaning you have permission to market photos of individuals.

A good person portrait can be much more than just a posed head and shoulders. Look for interesting compositions with balance and sometimes romance. Sometimes getting above the subject or lower down can make a big difference. With people poses avoid the full-face mug shot. A 3-quarter face looks slimmer and much more friendly. Watch your lighting and don't have your subject squinting into direct sunlight. Turn them around and use fill flash if you need. Always keep talking to your person with a fun, friendly personality.

Exposure tips!

Centre weighted metering works the best with exposure compensation for dark or bright backgrounds. On sunny days try and shoot in the shade and avoid speckled light from trees. On a sunny day the colour temperature in the shade is going to be much higher (8000 Kelvin) so use the shade white balance to avoid the horrible blue cast often seen in bad portraits. Flash lighting is similar in colour temperature as diffused sunlight.

It is often desirable to use some level of flash to fill in shadows of the face and put a sparkle in the eyes. Don't use too much flash or you will blow out the highlights. TTL fill flash with some negative compensation often will give great results. A reflector will soften the shadows of the flash and diffuse the light to give wonderful results in the field. You can use a large disk reflector if you have an assistant but watch it does not dazzle your subject. The comfort of your subject is very important, so keep chatting and provide some fresh cool water on a hot day. Your bridal party will love you for it. Shallow Depth of field is desirable so the use of a 100 mm lens for head and shoulder shots will throw out the background. Watch extreme wide angles at the edges of the frame as the people will often be slightly distorted making them look fat. 35mm to 50mm (normal) is excellent for full body shots and don't shoot too close to your subject as it can be imposing. Stand back and use a longer focal length to get closer and blur the background.



Andrew White

Anything else?

I could go on all day but one more tip. Watch your gear. Keep it dry by holding an umbrella on a rainy day. If your gear gets damp then put it in the hot water closet when you get home and leave it there overnight before you use it again. Most professional cameras are water resistant.

More security tips!

Keep the security of your cameras and cards at a maximum. I personally always keep my wedding data cards on my person until they are backed up. I use a Lowepro card pouch secured on my belt. Don't download them to an unsecured laptop without keeping the backup cards. Like cameras, laptops are in demand by thieves. Always aim to have at least two backups of a wedding or the original cards locked away until you can download and back up the files.

8.3: Panorama



You can also take a series of images and stitch them together in Photoshop. You can also crop the middle out of a high-resolution photo.

Who buys them?

Panorama images are desirable as prints, similar to those purchasing landscape images.

Exposure tips!

If shooting an image with the intention of stitching lock the exposure meter to keep consistent levels of exposure, or matching the composition will almost be impossible. The image above has been stitched. If you intend stitching, then don't shoot at extreme wide angles. Keep it at 35mm to avoid barrel distortion. Barrel distortion will bow the horizon making it difficult to match the photos.

8.4: Reportage or Photo journalism

This style is often the domain of the professional newspaper correspondent, freelance press or the celebrity magazine photographer.



It involves photographing people or events that are news worthy. The style can also be highly desirable in events such as weddings.

It basically means the photographer has control over the composition without the subject responding to the camera. Natural images can be achieved with people going about an activity or their daily lives. This makes it desirable for the press.

Who buys them?

Newspapers, online publishers, magazines, news agencies and sometimes the advertising agencies.

8.5: Still life Photography



Can be more than just apples in a bowl on the table. Often floral images in natural environments make excellent still life subjects. Defined as motionless your choices of creativity are limitless.

Who buys them?

Publishers mainly and sometimes advertising agencies on commission. Food photography is a big market.

Exposure tips!

Lighting and composition are the things to watch. Often a shallow depth of field can yield pleasing results so try shooting at a wide aperture and longer focal length to achieve this. Soft diffused natural light is best, as is nearly always the case, so try for a cloudy day if shooting outdoors. Diffused soft boxes and studio flash is often used in the studio and in the field as time to set up the shot is ample in still life photography.

8.6: Commercial Photography



Can be anything as large as a truck to small products. Excellent client communication skills are needed. Fashion and beauty photography is a specialist field usually the domain of dedicated studios in major centers.

Who buys them?

Commission assignments from advertising agencies and client commissions.

Exposure tips!

Correct lighting and composition are paramount. Studio lighting can be complex as is postproduction in Photoshop. You will be best to learn this in an active studio often heavily involved in product and fashion photography. This is one area that practice and knowledge are paramount, and with the case of the trucks and models an assertive personality able to give direction, is needed.

8.7: Macro or close up



Macro is the close up art of photographing something very small to create images with a high level of interest. Or photographing a small part of a larger object.

Who buys them?

Publishers on commission and they can make welcome additions to a dedicated small species stock library. There are many million species of rare and interesting insects. Often many of these subjects can be found in your own back yard.

Exposure tips!

A macro lens will focus at a very close range. They are often medium telephoto lenses and can sometimes make excellent portrait lenses. A wide aperture of say 2.8 is common as is the greater reproduction ratio of 1:1. Diffused natural light seems to work well. Try a little remote flashlight off camera to give the subject profile.

8.8: Sports and action

One of the most satisfying ways of enjoying both sport and photography can be obtained from the best sideline vantage points. If you love both sports and photography then a career in this area of photography is highly desirable.



Who buys them?

Sports clubs, newspapers and agencies. And Athletes as prints

Exposure tips!

A long telephoto lens of 400mm is desirable with a large aperture of 2.8. This can be an expensive piece of equipment, so shooting on staff with a newspaper is usually the way. Media passes to events are often required on prior arrangement and easier to get if you are on contract to a newspaper. Lesser lenses can often yield good results but more active photography participation is needed or, running around as we often say. Monopods to support heavy telephoto lenses are often used and cameras are now always digital with very fast

burst modes. You can get away with a consumer brand SLR but the professional brands such as the Nikon D2H are more suited. These cameras even have wireless networking for sending images direct to a laptop but I have never tried this.

8.9: Fine Art Photography

A satisfying style of photography where anything goes and usually does. Very common applications include Black and White photos. The usual thing to achieve is something contemporary that people may want to hang on the wall. These photos are usually for display in galleries and exhibitions.



Who buys them?

Art buyers, wedding photos can be desirable in fine art format. Canvas prints are becoming very popular.

Exposure and production tips!

Composition in an artistic way is the most important thing to consider. Excellent postproduction skills in Photoshop are important. Many fine arts photos are still hand printed and developed in a dark room from film negatives. These prints are very desirable and now carry prestige, maybe due to the rapid decline in dark room processing. It is expected in the art world for dated techniques to move from media arts to the realm of fine arts.

Next we will look at press photography with a focus on making a career out of photography in both the employed and the self employed (freelance) world.

Chapter 9: Press Photography

9.1: Getting Started

One of the best ways to become an experienced and efficient photographer is to work for a newspaper. The demands and variety of work will see you develop excellent time management and social skills highly necessary in all areas of photography. The work is varied and challenging and sometimes travel is required.

Most people starting out in this area are photography graduates dedicated to gaining skill and work experience. Generally a low paid position in a small community newspaper is a stepping-stone to bigger and better things, and because of this, these jobs are very competitive. Employers know that there are hundreds of people wanting these opportunities and are very selective. A photographer who gains a position in the media will gain a lot of valuable experience.

9.2: What is involved

So how can I show a prospective employer that I have what it takes?

Get out there and take lots of photos in a journalistic or reportage style. Build a strong online and offline portfolio showing your web and digital photography skills. All media photography these days is digital and delivery is via email or FTP. Above all show a professional approach to employers. These jobs are so popular that they are very rarely advertised. Get door knocking and send your CV out to as many editors as you can. Get on the phone, email to showcase your work and then arrange to meet your maybe new employer.

9.3: Reportage

What makes a good reportage photo?

One that tells a story. Shows interest, emotion, subjects and people involved in the story with strong compositions. Try different angles. Get low or high and use a shallow depth of field to emphasize the

focal point or feature and often your shots will be cluttered so this can also be of advantage. If the story is newsy enough even an amateur snapshot will make front page.

9.4: Travelling

What gear do I need to take?

Travel light is the main thing. One shoulder bag as light as you can make it. Your editor will want good strong compositions on the spot, so keep it light. If you want to carry a second camera body and four or five lenses then get a camera backpack and a Pacsafe. Don't ever let your kit leave your sight or you will never see it again. A super zoom is excellent for covering all bases without any hassle. Lots of memory, spare batteries and a good quality flash head. Flash head diffusers and reflectors are becoming more popular as photographers attempt to compete on quality of images in the field. The nature of newsprint means that printing results are limited and the first to suffer is under exposed photos, which will print very dark. Shoot with plenty of light and make the most of your flash head to brighten things up. A good gamma boost in post will also make them print so much better. Gamma is halfway between highlights and shadow on a curve graph.

Keep excellent records by carrying a notebook and match it with camera codes. Your editor will not run people photos without a full name so make sure you gain permission to publish and their correct name. CORRECT is very important and will save you and your newspaper a lot of embarrassment.

Back up all your photos with good references along with your field notes. You never know when someone will come back to you requesting a print from a published image.

The progression of a career is employment from small to larger media institutions and then into self-employed freelance photography.

Freelance photography is the realm of the self-employed person. This person will be skilled in many areas of photography. Unless the photographer is involved in a niche market he or she will be involved in many areas of photography in order to gain enough work to make a living.

Chapter 10: Freelance Photography and Tips

Once a photographer has gained the creative and technical skills to take excellent photos in demanding situations the move into business can be a natural progression.

Very often the photographer will purchase a developing or framing shop in town and couple it with a studio in order to promote his or her work. A shop can be an overhead you can ill afford. The profitability of print shops is declining as people fail to print digital photos. The popularity of the kiosk units is increasing and the cost of digital printing is falling rapidly. A home-based photography studio is a better idea. Working from home is great for lifestyle and tax reasons.

The computer has literally opened up the world to markets for stock and freelance photography services. A good website, at the very least, is necessary to promote and sell your services when you are working from home. You can use a spare room to set up an office and a converted garage for a portraits studio, complete with lighting. A great idea is to combine a home office with a selection of stock images available on a database. You will be amazed at how affordable and easy it can be.

Wedding photography is usually a good earner for the freelance photographer. This is demanding so a high level of preparedness and professionalism is all-important as is client management and personality. A good experienced wedding photographer will always be in demand and the income will become invaluable to your business. In a small city or town weddings will probably be a necessary thing to making a successful photography business.

Business skills are just as important as is your skill behind the lens so do a basic small business management course and learn how to keep good financial records and how to control your cash flow. Running a small business from home is not as easy as you think. You must be dedicated and focused. The travel and flexibility it affords is wonderful if you manage to achieve this as your goal. I enjoy this lifestyle very much. Thousands of photographers run very successful businesses from home.

Let's now look at modern ways of marketing your photography business

Chapter 11: Marketing your Photography

11.1: Stock Libraries

Stock photography libraries are places where buyers come looking for suitable images. Buyers will be looking for a site that is easy to navigate and are more than prepared to pay a fair price for excellent images.

Commercial libraries can be huge collectives like 'Photographers Direct' where buyers and sellers come together in a controlled fair environment. Buyers can also request images and photographers by publishing a request on this site. This service is the best and fairest system I have seen so far. You need to have good quality photos in order to participate.

The screenshot shows the PhotographersDirect website. At the top, the logo 'PhotographersDirect' is in red and blue. To the right, it says 'Stock Photography' and 'Andrew Whyte: [your home](#)'. Below the logo is a navigation menu with links: '< HOME >', 'BUYERS', 'SELLERS', 'TESTIMONIALS', 'NEWS', 'WOW!', 'CONTACT US', and 'SITE MAP'. A search bar is present with the text 'Image Search:'. To the right of the search bar are options for 'Print: 10in/25cm', 'Images: 20 per page', and 'Quality: 5+'. Below the search bar, there is a line of text: 'Use AND, OR or NOT or speech marks to refine your search. eg. elephant AND seal football OR soccer elephant NOT seal "London Bridge" pdf12345'. There are also checkboxes for 'Required', 'Orientation: horizontal, vertical', and 'square, panoramic'. A search button is labeled 'Search for: Photographer Stock Source More Images'. The main content area is divided into three columns. The left column features a photograph of a Native American person in traditional dress, with the text 'Picture Buyers' below it. The middle column has the heading 'Photographers Direct' and a paragraph: 'is a photographic portal to help picture buyers find suitable stock photography images for books, magazines, adverts, brochures, calendars or any other media. To date, we have connected 2,750 buyers from Australia to Venezuela, with 5,228 professional photographers from Andorra to Zimbabwe and already have 374,458 stock images in our search engine. In response to the enormous changes that have taken place in the photo business in the past few years, we have pioneered the concept of "Fair Trade Stock Photography". Our photographers receive 80% of the'. The right column has the heading 'Picture Sellers' and a photograph of a large spider, with the text 'Large spider fabric sculpture at dock at Ovingdean Museum, Bilton Spain Europe' below it.

There are many stock libraries available for you to join and some are better than others. Don't join one that sells low quality images at very low rates. Low-balling your sales will not mean you will have a healthy business with a strong turnover. Taking good images costs a lot of money and even more so with the fast pace of digital camera developments. If you are going to display your images for free on a website make sure you participate in an advertising referral program such as google adsense...

A prerequisite to marketing online is excellent Photoshop skills in optimizing images for online presentation. Remember every screen type and setting is different so brighten up those darker images and

boost contrast if you feel it will help set an even display on most machines. Google also has some useful free tools...

11.2: Websites

Setting up your own website complete with a stock library is now becoming easy and more affordable. Features such as search engines, light boxes for client selections and slideshows should be part of your library. The ability to easily add and delete photos and galleries should also be part of it.



Recently the availability of server side PHP and MYSQL data scripts and programs has become popular. You simply purchase the software for as little as US\$100 dollars and instruct your developer to install it on to your website server. These scripts give you complete server side control of your website and all the benefits that come with it...



• A comprehensive control panel

- Search engines on your site on keywords and titles
- Create or move galleries with ease
- Add or delete thousands of images from your own database server
- Slideshow your photos on the gallery
- Your images can be sent as ecards
- Make your images available for rating or comments
- Make preview images available for download
- Include a downloadable light box feature

One of the most popular scripts are 4-images and gallery 1V. A quick Google of any these scripts will point you in the right direction.

Your developer will do most of the work on your site including design and installation of the PHP scripts. He or she will work with you to design your site templates and sales pages. Implementing the database and supporting you through the learning curve so you can administer your galleries should be part of the service.

Your website can be as comprehensive as you like but running a site with only your own photos on it will mean you will want to target niche markets, such as travel photos, if that is what you are interested in or even wedding galleries if you are a wedding photographer. The important thing is ease of use of your website, making it a place where buyers return to obtain desired images.

If you do not wish to go to this level you can use the web page tools in Photoshop but a server side data base system is much more advisable.

Chapter 12: Your Photography Business

12.1: Payment for your Photos

As a business person marketing your photos you will need to run a chart of accounts and use a financial software package that will keep control of your debtors and creditors. Invoice and statement forms are necessary to good business.

Accepting credit card payments online are also important and the use of third party payment servers are popular such as the one you used to purchase this ebook. Paypal is by far the most popular multi currency payment server on the net and offers stable security features. If you set up a Paypal account make sure it is a business account. Adding features to your website such as buy now and shopping cart features is straight forward. Personally I find the on line invoicing tools and billing features the handiest. The wonderful thing about Paypal is you only pay, 2-4% of your sale. There are no monthly costs.



Another option is 'Clickbank'. Offering an easy to administer affiliate network as well as payment via credit cards. An affiliate network is where other people earn automated payments to sell other people's products or services.

So now you have a good reliable way of getting paid, how do you deliver your images?

12.2: Delivering your photos to your clients

Delivery of JPEG files via email is now more than acceptable in the stock photography world. Make sure the photos are of a high quality and not overly compressed. A photo of six million pixels will print to A4 and can be emailed from as little as 1.5 megabytes. Capture and edit the photos in the Adobe RGB colour space. The other popular file format is TIF, which are much larger in memory size and more suited to delivery on CD. Photoshop or PSD files are also acceptable but these files are way to large to email. You can courier deliver your files on CD if broadband transfer or file type is an issue. Burning the edited files on CD is easy and affordable.

The industry standard is now high quality JPEG's files simply because they are easy and affordable to move around the world. The print results from these files are also more than acceptable on modern RGB printing machines. Offset printing methods are more suited to TIF files.

I hope you have gained even more knowledge and enthusiasm from my experiences in the world of photography. Return often to my site for future publications and updates of this tutorial. I would love it if you passed this ebook on to at least two people today, who would also benefit. If you intend photographing weddings then I suggest you invest in my Wedding Photography ebook.

All the best to you