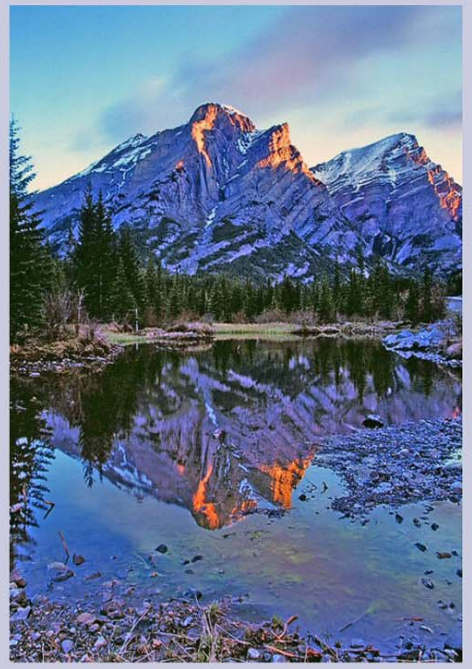
The Concise Guide to Photography

A beginner's SLR camera handbook.



James Hutchison

Foreword

In this, my first attempt at capturing the essence of photography for the beginning enthusiast, I have tried my best to make the dry stuff as interesting as possible, and the fun stuff presented as just that: interesting and intriguing. I wouldn't be behind my silly computer slaving away at this manuscript - where it's 86 degrees Fahrenheit I may add - unless I loved doing it… and *that* I do.

Writing has become almost as much of an outlet for me as photography, so that coupled with my passion to always share what I've learned, has resulted in this short'n sweet book on photography. It is truly my desire to help you - the eager learner - with an introduction to a most wonderful, exciting, and fun past-time: the world of photography.

I would like to dedicate this work to my beautiful wife Moira who loves unconditionally, tolerates my foibles with incredible patience, and fills my heart with joy like no one else.

James Hutchison

Table of Contents

The Concise Guide to Photography

by James Hutchison

I think all of us can tell the difference between a poor photograph and an outstanding one… but not everyone can really explain **how** they know the difference. De-mystifying photography is what this short book is about, but that's not all… the author wants to motivate you to dust off your camera and get excited about taking beautiful images. It's easier than you think!

Introduction

So, why bother learning more about photography? After all, you have photo albums and shoe boxes that are filled with pictures of your family, friends, trips… they all look good enough, right? But maybe you've always had an innate, hidden yearning to do better; perhaps you or someone you know has a good camera that you'd like to learn to use. But you say to yourself "There's SO much to know… I won't bother right now". If photography is becoming more than a casual interest, this book is a great kick-start because it's short, yet it covers a lot of material.

I'm hoping to motivate and inspire you to dust off that 35mm SLR camera and start something fun - something that will bring rewards for the rest of your life. It happened to yours truly… I was gifted with an old Pentax camera more than a decade ago, and I thought "Man, now I get to have some fun!" A lot of people tell me they want to own a "good" camera, but never do anything about it. Had I known the rewards of owning an SLR, I would have bought one for myself long before.

The first thing I suggest after you acquire/beg/borrow/steal your 35mm camera is to buy five or ten rolls of film, and photograph anything and everything that catches your eye. Try time exposures (a tripod will necessary here), double exposures, close-ups, you name it. If you don't have a manual for the camera, get one from the manufacturer or do an Internet search – you'll find one almost guaranteed! The point here is to get to know the camera's dials and controls.

Section 1

The History, Physics, and Science of Photography

Before we start, I'd like to make a minimum recommendation for a 35mm SLR camera that will provide creative control:

- Internal light meter.
- Manual override of auto settings for f-stop, shutter speed, and ISO.
- Depth-of-field preview.
- Lenses for a 35mm film camera: 28mm, 50mm, and a 80-200 zoom.
- Lenses for a digital camera with 2/3rds size sensor: 19mm, 35mm, and 50-135mm zoom.

Other features that are nice to have, but not necessary are mirror lock-up and auto focus. Film cameras these days with all these features can be quite affordable if you don't mind buying used.

You may be wondering what brand to buy. That's a very personal choice, with the major factors being affordability, availability, and servicing. Brands to consider are Canon, Nikon, Pentax, and Konica Minolta. There are others, but these are quite common, and have a variety of models to choose from.

So, after shooting all those test images I mentioned earlier and you get the exposures back from the lab, you'll find some you like, and some you don't. I've often exclaimed - "…what the heck was I thinking there???" That's where this book comes in. Read on…

A Short History of Photography

Any book that tries to teach and motivate on a particular subject would be incomplete without at least a little background. Skip to the next section if history bores you…

Pinholes. They can be nasty, depending on where you find them. But believe it or not the ancients of our time used them to cast images on walls. To this day, there is a genre of photography that uses just that. Obviously called "Pinhole Photography", there is no lens in the camera… just a hole a little smaller than ¼ of an inch.

It's easy to see how it works: get yourself a piece of cardboard – say – a foot square, and make a hole in the middle with a pencil or a nail. On partly cloudy day, go outside and use the cardboard to cast a shadow on something smooth and dark… hold it two or three feet above. Besides the obvious shadow from the cardboard, you'll see an image in the center that looks like the sun - because it is. And if clouds are passing in between, you'll see them detailed as well. Cool eh? This simple trick is used to safely view solar eclipses.

Then people got into chemicals. No, not the psychedelic ones the 60's are known for - I'm referring to things like silver chloride, silver iodide, and salt. It was discovered accidentally in 1727, then refined as the years passed… that these chemicals were sensitive to light. 1816

saw the first pinhole camera using nothing more than a box, and some paper treated with these photo-sensitive chemicals.

1861 saw the first color photography, then Kodak rolled out their first camera in 1888. As they say, it's all history since then. There were many obvious enhancements and refinements since then, but that's the general background. Congratulations if you've read this far.

The Physics and Science of Cameras

On to the camera itself. Don't get scared; I won't throw anything at you that wouldn't have been introduced in grade school or high school… but it's important to have an understanding of why and how a camera works the way it does so you can manipulate all it's dials and buttons knowing what they'll do to your image. What we're talking about here is the marriage of science and art. If you want to be a painter, you'd have to learn all about the various media, oil and water paints, etc. So, here we go.

Factoid
"SLR" means "Single Lens Reflex" which is the technical term for being able to view your subject through the actual lens that is taking the picture. All accomplished by a first-surface reflex mirror and a five-sided prism.

The camera is just a light-tight box, and lens. That's the essence really; remember as a child focusing the sun with a magnifying glass on a piece of paper… and it started to smoke like a banshee? After your lecture on the evils of tobacco, maybe you took it a step further and projected an image of a brightly-lit window on the opposite wall. If not, trust me, it works. If you didn't read the short history of photography, there I mention how pinhole cameras project images as well… lenses just capture light with more intensity, and have a specific focal length. All that means is the magnifying glass has to be exactly the right distance for the image to be in focus.

Then there's the film. Film is *just* like your eye's retina – the light-sensitive part at the back. I'm sure you've seen a picture like this one before:

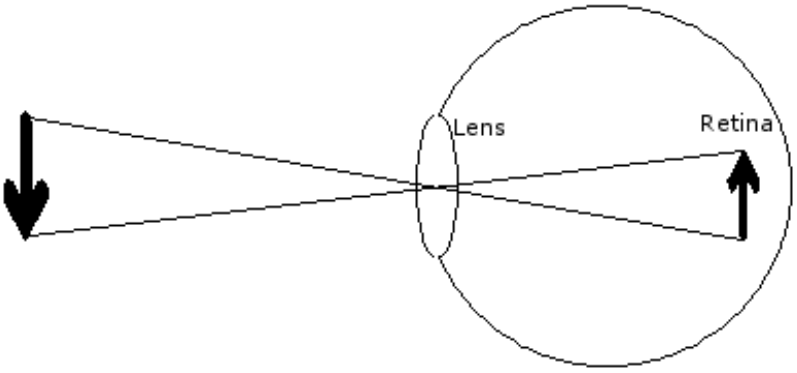


Figure 1.

Excuse my simplistic illustration in figure 1 (…I think the scale is slightly larger than life. Unless you're a cow), but wherever there is light striking something like the arrow on the left, the light scatters, waiting to be captured by your skillful photography, or someone's hairy eyeball. Your camera works just like your eyes, except Pentaxes, Nikons, and Canons don't get bloodshot. Instead, their batteries fail… just when you need them most!

Like your eye as well, your camera has an "iris" – it's called an aperture adjustment. This controls the amount of light hitting the retina. (Film – remember the analogy?) So why is this control necessary? Well, your retina can't handle the truth. Not all of it at once anyways… Sunlight is *so* bright, it can actually cause damage. Think of how sensitive your eyes become in almost pitch-black for a long time. It's amazing how much you can see as your irises open up and let ALL available light in. Sunlight is literally hundreds of times brighter that that, so – control is needed.

Same for film. Film has an even less range of sensitivity, so more control is needed. Hence the requirement for aperture adjustment. In case you're wondering, this is what "f-stops" are… it's the term used to refer to a specific opening measurement. Remember this one thing: the lower the number, the bigger the aperture, and the more light is let in to the camera.

There you have it – the basic science behind your camera. The only other variable in all this is the various sensitivities that film comes in. Not as confusing as f-stops, films are rated with numbers that increase as the film becomes more sensitive. So, 100 ISO film is half as sensitive to light as 200 ISO. 1600 ISO film is 16 times as sensitive as 100 ISO. Simple. Except that film grain get more pronounced as the numbers increase. Same with digital cameras: digital noise is introduced more and more as the ISO setting is increased. This is where experimenting is necessary to learn what works.

Refining the Concepts

As simple as these concepts can be, their interactions and dependency on each other require a bit of figuring out. I'll get to that – but first, let's talk about…

Lenses

A regular run-of-the-mill magnifying glass won't do for good pictures because of something called chromatic aberration. That's because whenever light is bent, the different frequencies (read: colors) bend at different angles, so reds will land on a different spot on your color film than violets. Specially-designed lenses compensate for this.

Then there's the internal reflections that naturally occur when you pile a bunch of lenses together. Some lenses today have 13 or more glass elements, so you can imagine that reflections could be an issue. Well, maybe you can't… but I've done research on this stuff, and it's amazing how lens technology has advanced to today's standards. Anyways, combining multiple lenses used to be impossible till something came along called "anti-glare coatings". They suppress – quite efficiently - the internal reflections that would otherwise bounce around inside a camera lens and render the image unusable.

Lenses come in a myriad of focal lengths and types. Primarily, there are two types: fixed-length (or "prime") lenses, and variable focal-length ("zoom") lenses. Either can also have

a feature called macro, in which you can focus quite close to your subject, which is great for small things like bugs, flowers, and toenails (yup, I've seen it…) Prime lenses tend to render sharper pictures because there are less elements to absorb light and subtract from the original image. Zoom lenses are somewhat of a compromise on quality, but are a photographer's dream come true, especially when the subject is dangerous and getting close just isn't an option. Adjusting the zoom allows for a perfectly framed shot without having to move too much.

Then there's the speed of the lens. When determining how "fast" a lens is, just look at the f-stop range. What's the smallest number? Remember the smaller the f-stop number, the larger the opening. For example, an f2.8 400mm telephoto lens would be considered REALLY fast, but it'll be really heavy too - it takes a lot of glass to capture that much light.

Figure 2. This lens is a 400mm f 2.8, and weighs in at almost 12 pound, or 5 kilos. The cost is up there too… about six thousand dollars U.S. Image Copyright Canon International.

There is a consumer-level lens that I use quite a bit for general use that only set me back around $300 dollars – it's an f3.5 to 6.3 28-300 macro zoom. And it weighs in much lighter than twelve pounds! Great for hiking. Let's break those numbers down.

F3.5 to 6.3. That means that at it's wide (28mm) setting, the f-stop can go as large as 3.5. When fully extended to 300mm, the aperture drops down to 6.3. Not terribly fast, but very practical if it's the only lens you're going to take with you.

F-Stops Revisited

Aperture adjustment is to your camera what the iris is to your eye. Already covered earlier… but, there's something else it does. Referred to as depth-of-field, this is one of the main things that differentiate an SLR camera from a cheapie point'n shoot. A wide opening such as f2.8 will require more exact focusing than something shot at f22. (Remember – large number equals small opening). The resulting image will have a foreground and background that is out of focus, but the subject in focus. Also called selective focus, this is one aesthetic control to use when appropriate.

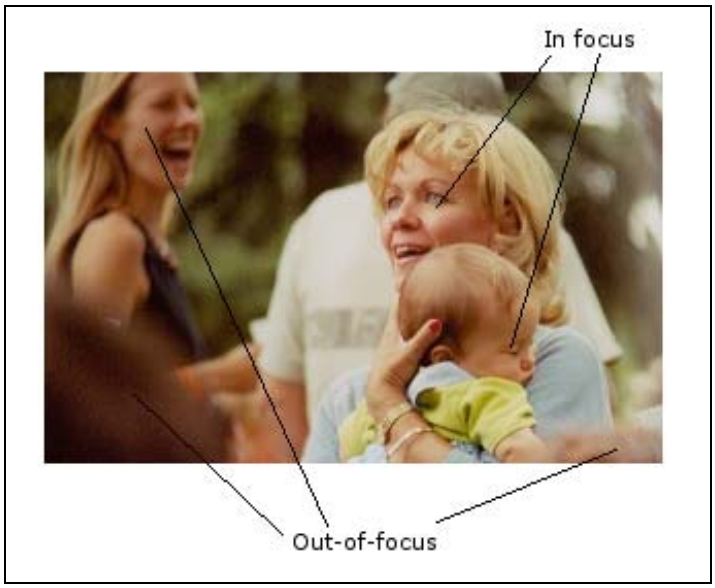


Figure 3.

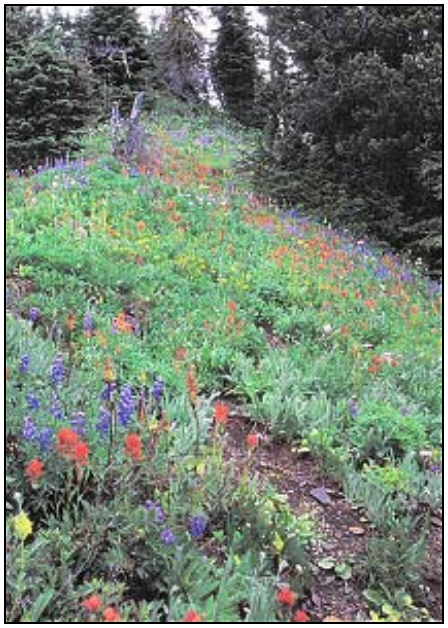


Figure 4.

Figures three and four show the two extremes of narrow and wide field of focus. The first used an aperture of f2.8, and the second f22. But – what does that do to the other camera settings? Remember it was mentioned earlier that there are interdependencies with these settings. Let me explain.

Light Meters

With your film or digital sensor set to 100 ISO, we need to adjust shutter speed and/or f-stop. That's because we need to expose the film just right. So, the more we close down the aperture for

landscape shots for instance, the only way to let more light in is to slow the shutter speed down. That's why keeping your camera steady is important. Tripods are great for this.

Conversely, say we're shooting a boxing match, and we want a really fast shutter speed to freeze that glove schmucking the other guy's chops. Well, when the shutter is only open for – say 1/1000 of a second - the aperture has to be as open as possible to let in sufficient light for proper film exposure. Shutter speed and aperture have what is called an inverse relationship; as one increases, the other decreases. It *has* to be that way so a consistent amount of light exposes the film. Like a teeter totter – as one goes up, the other goes down.

Photo Tip:
The ISO rating of your film or digital sensor setting is the first consideration when planning a shot, which of course has everything to do with both available and artificial light. Use a lower ISO (25 to 200) for bright sunny days, medium (400 to 800) for action-stopping shots (indoors or out), and high (1600 and up) for low-light situations where you can't use a flash. And - if you over-ride that 1600 ISO film to 3200, just tell the lab - they'll "push process" it for you.

You may be asking by now "…how am I supposed to know what to set my camera at?!?" Good question. That's why we have light meters. What do they do other than measure light? Well, the one built into your camera, and external ones that are dedicated to photography, will tell you *everything* you need to know to take a well-exposed picture based on the 18% grey standard. In other words, to get a mid-grey exposed properly, a light meter will tell you what f-stop, and shutter speed to use based on the speed of film used. Cool eh? Even if you change one of those parameters, it will make it up by changing one of the other parameters so that in the end, you get a properly exposed image.

Most – if not all – cameras these days have internal light meters that will set your camera for you. Get to know how to read your light meter by reading the camera's user manual. If your camera doesn't have an over/under light exposure scale, then you may want to either consider upgrading your camera, or acquiring a light meter.

Most cameras know what speed the film is because of an encoding technique called "DX". It's like a simple bar code on the side of the film.

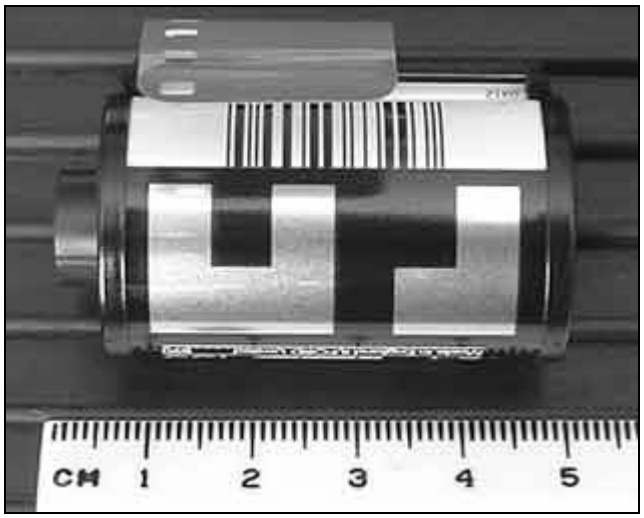


Figure 5.

The camera has sensors that read the code, and adjust it's exposure settings accordingly. Digital cameras have a setting that the user adjusts to actually change the ISO "film" speed, which can happen from picture to picture. Not like a film camera that is stuck with that ISO for the whole roll.

So, the camera knows the ISO. When you depress the shutter, it quickly takes a reading of the image, and adjusts shutter speed and aperture. But is this what we *really* want?

Please say no! To have full creative control of depth-of-field for instance, take the camera out of full program mode to what is called aperture-priority, and set the aperture to what you want *first*, because of all options, this is the most important aesthetically. Then the camera will choose the right shutter speed for you. If you have a manual camera, or a camera that is semi or fully automatic set to manual operation, set the aperture and shutter speed according to good exposure rules. More on that shortly. This means keeping an eye on the light meter as you adjust the aperture, because exposures below 1/60 of a second require a tripod.

Photo Tip: Depth of Field Preview

If your camera *happens* to have this feature, you can actually see what will be in and out of focus when viewing through the viewfinder. It will darken the image somewhat depending on how far down you have stopped the aperture, but it's a useful tool when depth-of-field calculators are nowhere in sight. When you are viewing your shot normally, the aperture is always wide open. The DOFP button closes the aperture to the exposed setting, showing you what the camera will do when the shutter is tripped.

For ANY landscape shot, use a tripod – you want your images as sharp as possible. Sports/action shots at a wide open aperture sometimes look cool if there's a bit of motion blur. But you still want as wide open an f-stop as possible.

Exposure

I mentioned earlier something about 18% grey… this is what light meters expose for. It's good for run-of-the-mill shots, where the difference between the light and dark portions isn't that much. But remember that light meters are dumb. Really dumb. They need our help, and to do that you need to know what your camera is doing.

Earlier cameras used only a center-weighted average, meaning they take an average reading across the whole scene, but are biased towards the center. But what if the subject is in the upper right, as directed by the Rule of Thirds? (That's coming later…) Hmm. Your camera doesn't know about this rule I'm guessing… Hopefully it has what is called "Exposure Lock". As most cameras are center-weighted in their exposure measuring, they'll have this feature as well.

Outsmart your camera by 1) centering the subject, 2) depress the shutter half-way to get a reading, 3) depress the exposure lock button, and… 4) re-compose and fire. There will be a built-in timer (around twenty seconds) before returning to center-weighted exposure measurement.

Then there's selective exposure. No, not you – your camera. Some have the option of choosing between center-weighted average and spot-mode. In spot mode, the exposure sensor is still centered, but extremely narrow. This is great when there is a wide variation of light and dark tones, creating a difficult-to-expose photo. In spot-mode, find a mid-toned portion such as grass or trees, lock the exposure as above, and recompose to take the shot.

There are situations where the above will save your picture quite dramatically. If you've ever noticed, most winter shots that have a lot of snow look drab and under-exposed. Using the above technique will actually *over*-expose the shot from what the camera thinks is OK… snow isn't grey, right? Again, you have to outsmart it's programming.

Another technique to compensate for your camera's poor judge of exposure is called bracketing, which involves taking multiple shots of the same subject, but adjusting the exposure over and under the camera's reading. That equates to 3 exposures for one shot, but you've increased your chances of getting the exposure dead on. Use ½ f-stop increments for slide film, and one full f-stop for print film. Digital sensors are closer to print film, so bracket one full stop either side.

Hyperfocal Distance

Here we go again. More theory. Sit tight tough – it's not that bad. While reading the section on depth-of-field, some of you may have wondered how *much* of the foreground and how *much* of the background will be in and out of focus. Older lenses used to have a scale on them that actually depicted it quite well, but not the more modern ones. There are calculators that figure out what the focus range is for any given f-stop… it's a tad involved because it's different for the various focal-length lenses.

For instance, the range (or plane) of focus for a 500mm f2.8 telephoto with a subject one hundred feet away is a mere one foot. Everything else in front and behind is blurry. Compare that to a 28mm wide-angle lens set to f-22, focused at a hundred feet as well - objects just four

feet away are in focus, all the way to infinity. Wild eh? So, the Internet is rife with depth-of-field calculators that you can play with and print out for your particular selection of lenses.

Film Versus Digital: Special Considerations

Shooting film and shooting digital are different. The basics of physics and aesthetics remain the same of course, however there are two important differences you should know about: Lens focal length and color rendering.

Lenses: because most digital SLR cameras have a sensor that is two-thirds the size of a 35mm frame, the sensor isn't capturing all of the image. This effectively changes the focal length of the lens. The following comparison will illustrate this clearer than I can explain it.

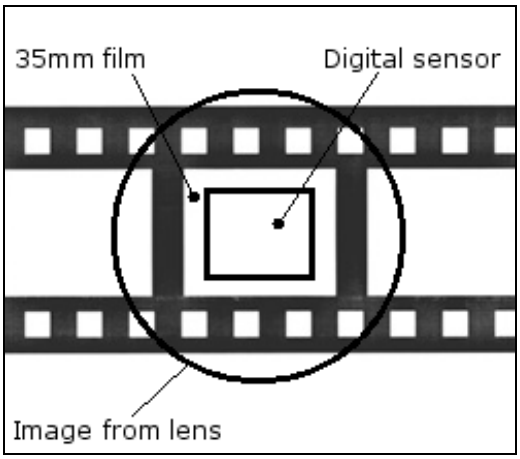


Figure 6.

As you can see, if you take the resulting image from both a film and a digital exposure using the same lens, the digital exposure will appear to have been zoomed in somewhat. Therefore, the effective focal length of the lens is different. In the introduction I recommended various lenses to have in your kit, and pointed out the difference between film and digital. Here it is again:

35mm Lens	Digital Equivalent
28mm	19mm
50mm	35mm
200mm	135mm

…on and on… just multiply the 35mm lens by two and divide by three to get the 2/3 equivalent that you'll need for your digital SLR to get the same image.

Color Rendering

Film offers a variety of choices for the photographer, whether they opt for the saturation and fine grain of certain slide films suited for nature and landscapes, or the neutral treatment a

professional print film will provide for weddings and portraits. Digital cameras provide one color interpretation of the subject only, but certain qualities may be digitally manipulated later on a computer. Pros I know shoot both, and I can't tell the difference after they have tweaked and adjusted for saturation, color balance, shadow/highlight detail, etc.

Section 2

Through the Lens: Seeing the World Like a Camera

Taking beautiful pictures is a very deliberate process, and if we have a thorough understanding of the limitations of optics, digital sensors, film, and exposure metering, we can compensate and adjust for them. I've alluded to some of these already, but I'd like to clarify and expand on them.

Dynamic Range

Firstly, photography is all about controlling light. Some call it "Painting With Light", which I'm sure is the title of a book somewhere. The first limitation, or difference between our eye and a camera is something called dynamic range. All that refers to is the darkest and lightest details film and digital sensors can capture in comparison to the human eye. Because our eyes have a very wide dynamic range, we have to control light so as not to over or under expose our image.

Slide film has about a 6 to 7 f-stop range; print film (negatives) is about a 9 to 10 f-stop range, which is all quite narrow when compared to the human eye which has a range of 14 f-stops! That's an incredibly wide range, because every time an f-stop decreases by one digit, the actual amount of light doubles. Remember logarithmic scales from high school?

So, to control and compress the possible wide range in any given photo, there's some things we can do, such as fill-flash, reflectors, and specialty filters explained just a little later.

Photography is Art

Another reason we see differently than cameras (…and can't understand why that shot didn't turn out the way we thought…) is because we're trying to represent a three-dimensional world in 2 dimensions. We're basically trying to paint a picture that has a frame around it, so all the rules of composition come into play.

Go ahead - admit it… you're a closet critic when it comes to photography and art. The fact is though… most of us are! Something called "aesthetics" explains this natural-born talent we all have to look at a pic and go "wow – that's NICE!" It turns out there are very measurable qualities that explain why some things look good, and others don't. You learn these in art and photography school, so to save you a year of classes and homework, here's the basics.

Compositional Principles

The Renaissance period brought about many contributions to modern art, one of them being an understanding of the mathematical ratios of elements that make a visually pleasing design. This applies to both architecture and photography. The "Golden Rectangle" and the "Golden Ratio" are everywhere in nature, and they turn out to be quite predictable geometrically.

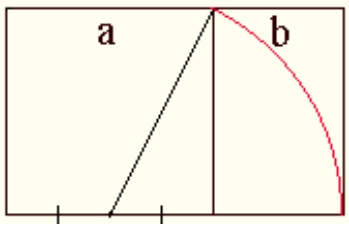


Figure 7.

Take a square (a), bisect the bottom side, and draw an arc from the upper right to the extension of the bottom side. Then complete the rectangle. It is fairly easy to show that this construction produces the right lengths. If a is 1, then a+b is 1/2+sqr(5)/2.

Ooh that hurts my head… but thanks to a bit of higher math I found on the web, we have a tool to help us make better photographs. Case in point: The Rule of Thirds. Tuck this one away – it's easy to remember. To make a visually interesting photo, don't place the subject in the center. Instead, move it to any one of these intersecting points in the composition:

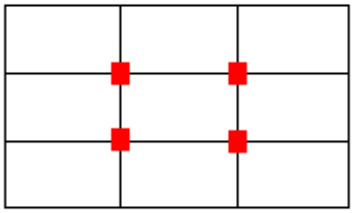


Figure 8.

By that I mean place the most interesting element of your photo at one of the red spots. Here's an example:


Figure 9. Notice the baby's prominent eye is in the upper left intersection. Makes for a better photo than if it was centered.

For people shots, a point to bring up is that unless you're trying to create a specific mood, it is best to have a person looking *into* the center of the frame as opposed to the picture's edge… that would create too much tension, and the observer is subconsciously wondering "…what's more interesting that I can't see?"

Another contributor to strong images is to include geometric lines and shapes themselves, such as triangles. A triangle is made up of three elements in a composition, and are very pleasing to the eye. Anything in threes is powerful, as painters and designers will tell you.

Figure 10. This photo illustrates the use of photo-
graphic elements to create two triangular elements.

One more thing while were on this subject: flowing lines that form an "S" shape is also a powerful design principle much used by artists. The white line illustrated in figure 11 follows where the eye will go when viewing:

Figure 11.

If you can consciously include this in your compositions, at the same time keeping in mind the rule of thirds and triangles, you'll be doing quite well, and far more than what most people do when they "point and shoot"! It can be quite tough to do in situations where that fast-

moving bald eagle - or uncle - is moving around so much you can't get a good shot. Take it anyways. In fact, take a bunch. That way, you're increasing your chances of getting it right.

A piece of advice given to me by a successful photojournalist was to shoot like crazy; that way you're increasing the probability of nailing that killer shot. Of course, that applies to certain types and styles of photography and not others… so if your subject is moving, and very fleeting, fire like a mad man. Subjects like still life, static landscapes, etc. doesn't chew up as much film. However, all the various styles of photography require you…

Being in the "Now"

What do I mean by this? Essentially, it's having presence of mind so that your instincts and knowledge kick in. This is why I'm a proponent of the shoot-like-crazy philosophy when you're first getting to know your equipment, and familiarizing yourself with this world of photography. Eventually, you'll notice that you have a certain style that you may want to develop. *Then* you'll know where you can break all these rules I've been talking about!

For instance, there are two photographers that come to mind that almost always center their subject in the frame: Ansel Adams and Freeman Patterson. If you study their work even just a bit, you'll note they have a very strong style that they can call their own, and is very identifiable. Sometimes breaking the rules is OK when there's something else stronger that needs to be emphasized.

Controlling Light

Light angles have a profound impact on your subject. Front lighting will flatten details, which is perhaps desirable when shooting a model, and emphasizing skin texture with side lighting is not flattering.

Figure 12. Use of a strong flash actually worked in my favour here, a good demonstration of front-lighting.

Side lighting will draw out details and texture, convincing the eye that we're looking at something that is three dimensional.

Figure 13. This is a sunrise shot that combines strong side lighting with diffuse lighting to create a very dramatic composition.

Back lighting is difficult to work with, and sometimes requires the use of some fill flash if the subject is close enough. In landscapes, a back-lit mountain range or tree can be quite striking, creating a silhouette.

Figure 14. These back-lit mountains and trees have almost no color, yet provide a visually pleasing subject.

Then there's diffuse lighting, which can come from an overcast day, or from a portrait photographer's lighting umbrella - it is much more pleasing than the direct and harsh light from the sun or a flash gun in many situations.

Figure 15. The diffuse lighting of an overcast sky eliminates harsh shadows and contrast.

Diffuse lighting also solves a problem mentioned earlier. As shadows and highlights are greatly reduced, so is the dynamic range of the lighting, which suits film and digital sensors quite fine!

So, that's light angle. It's not something you can always control per se, but rather *choose*. There are specific techniques and tools that actually do help you control light, and tame it's sometimes harsh and undesirable effects.

Polarizing Filter

If you're shooting anything outside, make friends with this wonderful filter. It's an essential tool that most photographers wouldn't think of doing without. What it does is filter out reflected light, leaving the true detail and colors to shine through. It also deepens blue skies if you're at 90 degrees to the sun.

Figure 16. Without a polarizing filter, the dark blue sky and clear reflection would simply not be there.

Neutral Density Gradient Filter

Also called "ND grad" for short, this filter reduces light in one half of the image, reducing the dynamic range of the light. This is most effective for nature shots when the sky is too bright, and would otherwise over-expose.

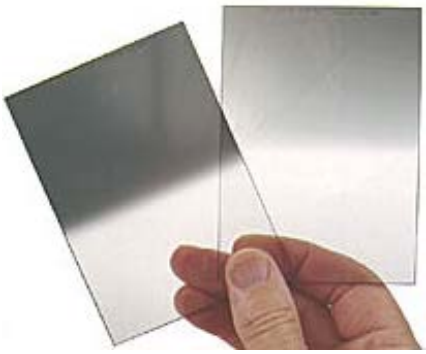


Figure 17. Image (C) 2001 www.Singh-Ray.com. Used with permission.

Filters in general are kept in place on your lens either by screwing them directly onto the lens front, or sliding them into a holder. There are various manufacturers of these filter systems, each with their own strengths and weaknesses. There's a list of them in the resources section at the end of this book.

As you can see from the photograph, they come in various strengths, generally one, two, and three-stop densities. They also have soft and hard edge variations. Here's what they can do to improve detail in otherwise blown out whites:

Figure 18. The picture on the left shows what happens when no filter is used. By placing the transition area of an ND Grad where the red line is, light is reduced enough to allow a proper exposure.

These two filters are essential if nature photography is your bag. If not, at least get a polarizer for the times you'll be shooting outdoors. There are other filters that may interest you as your skill level and experience grows, such as warming and cooling filters, color filters like red and orange if you're shooting black and white… all have there place, and no two photographers will ever have the same collection. Filters go hand in hand with shooting style. One last one to mention is the Gold-Blue polarizer. Depending on which way you turn it, highlights become colored gold or blue. It's a nice one to have for landscape and nature shots. One warning - it can play havoc with your digital camera if you use auto-white balance.

Figure 19. These two images demonstrate the effect of the Gold-Blue polarizer on reflected light.

Other Ways of Controlling Light

Whether in a studio, or the outdoors, light is seldom ideal. We've covered light angles and filters. Other means of controlling light are flash guns, reflectors, and diffusers. All are more commonly used for portrait and product photography, but often find their way into other genres as well.

Flashes are often integrated into SLR cameras. But they're small, quite weak, and produce a harsh and sharp light. Chances are your camera will have a hot shoe on top that looks like this:

Figure 20.

On this you will connect a good flash unit. (Sorry, my opinion is creeping in here… a $100 flash gun is worth its weight in gold). Each camera manufacturer has dedicated flashes that will work quite well with your camera, plus, there are a multitude of 3rd party manufacturers that are compatible as well. The key word (or acronym) is TTL, which means **T**hrough-**T**he-**L**ens. The flash unit and your camera communicate well enough with each other to know how much light to cast. Even in aperture-priority mode, the camera says "OK - that's enough light for this shot".

Figure 21. A flash unit such as this greatly enhances you lighting options when in a dark room, or if you're in need of some fill lighting to eliminate shadows.

More advanced models will have such features as wireless triggering so they can even work off-camera, and a choice of rear or front curtain firing. All that means is you're telling the flash to fire at the beginning of the exposure, or at the end of the exposure, allowing for more creative control. If you are controlling all aspects of your camera and flash manually, you must not set your shutter faster than what is called "sync speed". This is so the entire frame gets exposed to the flash.

Factoid
Flash guns come rated with numbers like refresh rate and gain number. The gain number (GN) determines the strength of the light, so go for the highest when comparison shopping.

Reflectors are used to control light by filling in shadows. Even just a piece of white paper or cardboard works. I've used Styrofoam, as well as a white projection screen. Portable reflectors come in white and gold so you can even warm up the color of the reflected light if desired.

Figure 22. The right side of this red pepper is lit with direct sunlight from a window, and the left with reflected light from a piece of white paper.

The image in figure 22 was created as an assignment for the New York Institute of Photography, in which an object had to be illuminated by both direct and reflected light. As you can tell, the right side is lit from a window with Venetian blinds. I propped up a piece of white bond paper just outside the frame on the left side, creating an even white light source.

Light diffusers scatter light in much the same way reflectors do, creating a wrap-around, pleasant source of illumination. The popular forms they come in are light boxes, umbrellas, and light tents. The light source itself can be a flash gun or strobe, continuous lighting, and even sunlight. If you really want to create a soft and pleasing lighting effect, combine diffused light with reflected light such as in this photograph:

Figure 23. The left side of this model's face is lit with a flash through an umbrella, and the right is from the reflected light of a projection screen.

Section 3
Digital Enhancement

Because film and digital sensors cannot reproduce what the human eye sees, it becomes necessary sometimes to enhance images using computer software. All of the following methods come from the "wet darkroom" days when specific chemicals and papers were used to control various qualities of an image. Some contend that this is image manipulation, but we are not altering the *content* of the image; only the *quality* of the image.

However, all this assumes that the image is in your computer. How do you get it there? Well, in the case of the digital camera, images are transferred with a cable or wireless connection. For film images, you need a scanner. If you're serious about all this, then a dedicated film scanner is the way to go. Also called "shoebox scanners" because of their shape, they cannot scan anything but film. You *can* get a flatbed scanner with a film adaptor, but you'll take a hit in image quality. Up to you and your budget. A second-hand 2700 DPI film scanner can be had for $200 on eBay, which is what I'd recommend if you're just starting out. At that resolution, you can make 8 x 10 prints without any perceivable degradation in quality.

So, your image is in your computer. What now? You'll want to view them, email them, maybe put them up on a web site, and perhaps print them. To edit the image and make it look as good as possible, you'll need a program such as Photoshop® or Pain Shop Pro®. There are others, but these are the two most popular ones. Photoshop® is by far the most powerful, and therefore the most expensive. It's the industry standard for graphic artists and photographers. Paint Shop Pro® is much cheaper, and yet has enough features and power for most users.

Getting to know your image editing software can feel daunting at first, but the web has literally thousands of sites with free tutorials. In any search engine, just type "Photoshop tutorial" and you will have retrieved enough information to keep you occupied for months! The following image adjustments are easy to perform, so let's move on…

Color Correction

Often when viewing a picture, the color hue seems off. This is quite common when using daylight film indoors. Our brains compensate for this "white balance" difference between the sun and incandescent lighting, but film REALLY picks it up. So, we need to alter the color to get rid of the orange cast.

Figure 24. I used daylight film with no flash, so the color cast of incandescent lighting is quite obvious. Paint Shop Pro version 8 has an auto color balance that does a great job compensating for this.

The other way around this is to use film meant for indoor lighting, which is what I should have done in this case. Digital cameras have a white balance adjustment meant to compensate for the varying light temperatures. You see, incandescent lights have a temperature around 2900 Kelvin, which is a scientific scale. Sunlight is 6500 K, and the color blue is 9300 K. As you can surmise from this, the hotter the temperature, the "cooler" the color.

Shadow/Highlight Compensation

Earlier in this book there is mention of the difference between slide and print film when it comes to color saturation and contrast. Slide film is awesome for nature landscapes, and print film does a great job for natural skin tones. However, the *difference* between the light and dark portions of a photograph may be too much for either film. In comes Shadow/Highlight adjustment. Photoshop has this as a menu item, but most other photo editing software requires you to play with curves and histograms.

Here is an image that is a great example of before and after S/H adjustment:

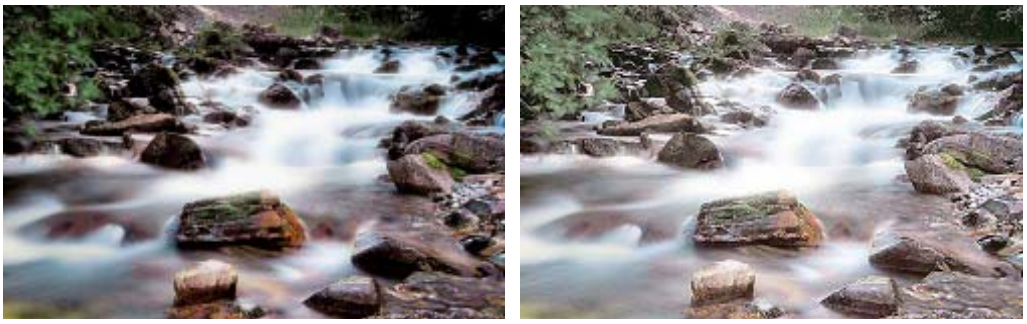


Figure 25. Opening up the shadow areas will provide a more pleasing and realistic photograph.

Notice how there's more detail in the shadow areas, yet the highlights are the same. Slide film tends to require this treatment more than print film. Each photograph is different.

Brightness/Contrast

These two adjustment are closely related, and therefore are grouped together as one influences the other. If an exposure is too dark or too light, use brightness and contrast adjustments to make up for the poor exposure. There's something to be said for exposing as accurately as possible, as not all shortcomings can be compensated for on the computer.

Remember – film and digital sensors only have a narrow range of light sensitivity when compared to our eyes, so if something is exposed too much, the whites will be blown out and there will be no detail recorded. Same for under-exposed: there will be no detail recorded, so no amount of computer power can restore something from an image that wasn't there in the first place.

Color Saturation

Use this to punch up your colors if they are lacking. On overcast or foggy days, colors may turn our quite drab, therefore increasing saturation my change an otherwise normal photo into something a little more interesting.

Figure 26. This early morning shot of the Rockies becomes more dramatic with the saturation increased. The bottom example is closer to what I remember…

Sharpness

When adjusting an image to look it's best, leave this to the very last. This is called "digital workflow", and there's good reason to do things in a certain order… this is one rule you don't break. The reason has to do with how pixels are handled when re-sizing happens. Therefore, re-size according to your requirements, THEN sharpen.

How do you sharpen and how much should you use? Sharpening can be compared to a musician who just bought his or her first reverb unit – reverb makes their voice sound like it's in a huge hall. Nine times out of ten, it is over used, creating a fake-sounding recording. Same with sharpening. When over-done, there are digital artifacts and haloes that get left behind. Use this one judiciously.

Figure 27. Over sharpening creates an unnatural image.

Sharpening is a bit of a misnomer as well, because it's not really finding detail in the picture that wasn't there before, but it increases edge contrast. The following clip of figure 27 illustrates this:

Figure 28. Here you see my hand has a white border. This is how sharpening works, and when over sharpened as in this photo, the effect is quite noticeable.

Photo Tip
A more advanced sharpening technique than just using the simple "Sharpen" menu choice is to use "Unsharp Mask", which sounds the opposite, but it isn't... you have more control. As a guideline, use a pixel radius of 1.2 for email and web-sized images, varying the strength according to taste, and 5 or more for files larger than 20 megabytes in size.

There are many other setting that may used to correct shortcomings such as red-eye for instance, but many photo editing packages have a one-button fix for that. Other adjustments are worth playing with just to see what they do; however I have covered the most important ones that make the biggest difference when enhancing you photographic images.

One last thing to mention regarding digital images on your computer. It is good practice to work with your image in TIFF format as opposed to JPEG, which looses detail every time a change is made. After you've sharpened to your liking, *then* save the image as a JPEG. The reason it looses information is because it compresses the image to make the file size much smaller, which is ideal for email and web use, especially for graphics-intensive websites. But for images bound for high quality publications and prints, keep it as a TIFF image.

Section 4
Resources

Thanks to the technology of the Internet, information can be had with the click of a mouse… therefore many of the resources here are just that – web sites. And the list is far from comprehensive, but it's a start. If you're reading a printed version of this book and do not have Internet access, your public library and local camera club are the first places I would start to gather information and advice on photography. Many excellent magazines are published monthly on various aspects of photography such as outdoor and sports, nature, fine art, etc.

Enjoy!

Camera Manufacturer Web Sites:

- Canon: (Canada) http://www.canon.ca/ (USA) http://www.canon.com/
- Nikon: http://www.nikon.com/
- Pentax: http://www.pentax.com/
- Minolta: http://konicaminolta.com/worldwide/index.html

Filters:

- Cokin: http://www.searlstudio.com/digital-photo-blog02080503.htm
- Singh-Ray: http://www.singh-ray.com/
- Lee: http://www.leefilters.com/

Photography Instruction:

- http://www.jamesphotography.ca/
- http://www.naturephotographers.net/np101/index.html
- http://www.photographycorner.com/photography-tutorials.php

Film Scanners:

- http://www.jamesphotography.ca/scanner_test.html

Film: *

- Fuji Superia Reala for print (negative) film
- Fuji Velvia for slide (transparency) film

Resources for Photoshop and Paint Shop Pro tutorials are too numerous to list… just do a Google search with the words "Photoshop tutorial" or "Paint Shop Pro tutorial". I recommend the same for any specific subject you would like to learn about.

* - Film is a very personal choice, however these two are high performing professional films that are used the world over.