



THE ART OF PHOTOGRAPHY

Taking Memorable Photos: The Basics



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eCrafted in the most wonderful of countries, Canada!

First Printing, 2014

ISBN 0-0000000-0-0 (Okay, I may get around to this eventually! 😊)

Robert Rienzo Publishing
123 Mindful Avenue
Compassion, ON Canada

<https://www.Living-A-Mindful-Life.com/>

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Photography as Art

While most families own a camera, very few use it as a means of artistic expression. Indeed, most cameras are purchased with the sole intent to document life's events – little Johnny's seventh birthday party or the family's vacation to Disney.

While perfectly fine as a means to archive our lives and share special moments with friends and family, such photos are more aptly described as snapshots, and are *not* the topic of this essay.

Photography as art has a very different intent – to capture the world in ways that demand more than a quick glance, that make us think, that show us the everyday in ways we've rarely, if ever before, experienced.

“Interest in any image is in direct proportion to
the amount of work the viewer has to do.”

Michael Freeman – “The Photographer's Eye”

To emphasize this point, what are the odds that the best photographic opportunities are to be found at the eye-level of a human? I'm thinking near zero. And yet, even without the benefit of a scientific study, is there really much doubt that 99.99% of photos taken annually worldwide are indeed taken from this exact vantage point?

In photography, as in any art form, familiarity breeds contempt. An object or scene photographed in a manner familiar to the viewer will, in all likelihood, be perceived as boring – been there, done that – and quickly on to the next un-engaging photo.

It follows then that if you wish to move beyond snapshots you will have to begin viewing the world differently, in unfamiliar ways – *in artful ways* – that will engage the viewer's interest and imagination.

Of course, if photography as art were easy, everyone would be doing it – but it is not easy; there are no pat formulas that will guarantee great photos. However, there are basic techniques that, if followed, can definitely improve your odds of making the successful transition from taking snapshots to creating artful photography.

Zen-ful Ponderings

Having said this, even if you eventually master the techniques of artful photography, these will fail you if not coupled with one absolutely essential element – a mind at peace with the world.

If your shooting time is wedged between other activities, if you're worrying about your kids or thinking about how busy you are at work or turning over in your mind the spat you had with your spouse or fretting that you won't come back with any great photos, your ability to see – truly see – will be greatly compromised (as will the pleasure of the photographic process).

When out with your camera the only thoughts on your mind should be about making keen observations of all that lies before you, moment by moment – worldly concerns must be of no concern while spending time with your camera.

Looking vs. Seeing

Why do there seem to be so many more interesting photo opportunities while on vacation? The answer is simple – lack of familiarity. The objects and places back home have become so familiar to you that they no longer warrant close examination – you have become blind to their opportunities for deeper insight. In the absence of close examination you are only *looking* at your surroundings, not truly *seeing* the possibilities they may hold.

But What is There to See?

When looking for photographic inspiration, think of the world around you as consisting not of objects, each with a familiar name, but rather as a collection of **lines, curves, shapes, intersections, colours, textures, patterns, shades of light and dark, reflections, and contrasts.**

Seeing the world in these terms necessitates looking beyond the familiar objects before you and, instead, looking at them in terms of these components; in many cases looking *inside* the everyday to see past their familiar exterior.

For example, when people look at the office building in which they work most see nothing more than an office building. However, a photographer in seeing mode may take note of:

- Reflections in the windows (which could be notable for lines, curves, shapes, intersections, colour, pattern, shading of light and dark, or contrasts).
- Shadows slanting across the building's exterior (lines, curves, shapes, intersections, pattern, shading of light and dark, or contrasts).
- The texture of the brick (lines, texture, pattern, shades of light and dark, or contrasts).
- A lone light in an otherwise dark building (contrast).

Finding the Unfamiliar

As mentioned above, one of the keys to engaging a viewer is to show them the world in ways they've never before considered. Here are some possible approaches to help you create the unfamiliar:

Unfamiliar Vantage Point

Because most people go about their lives looking at the world from the same vantage point day in and day out – with their eyes fixed somewhere between five and six feet off the ground – one simple way of presenting viewers with the unfamiliar is to NOT take any photos from this vantage point!

Instead, consider how the world may look from the vantage point of an ant, or a dog, or a bird, or a spider clinging to the side of a moving car, or through the eyes of a kangaroo as it hops along, or

Needless to say, most viewers of your photos will almost assuredly not have gone out of their way to try out such vantage points. By providing them with a glimpse of the unfamiliar, your photos are very likely to grab and hold their attention as they wrestle to make sense of something they've never seen in that way before. The range of unique vantage points is limited only by your imagination – so let it roam freely.

In this regard, it is important to comment on an all-too-common barrier to vantage point flexibility – an aversion to being seen as odd by others. Yes, laying on your back, camera in hand, on a busy sidewalk as passersby step around you can be daunting, and you will be viewed by some as decidedly weird, but if this vantage point is key to a great shot you cannot let shyness get in your way. So, celebrate the unusual – go out there and be your oddest!

Unfamiliar Size

A pea is about the size of, well, a pea. A photo of a pea depicted at its universally-familiar size is unlikely to merit much interest. However, photograph a pea with a macro lens (i.e. a close-up magnifying lens) and blow it up to the size of basketball and suddenly the familiar is rendered not at all familiar – what exactly is that huge wrinkled green thing that casts a menacing shadow?

Excerpts From the Whole

Here is a thought process that can often prove helpful in capturing the unfamiliar:

“That railing in front of the museum has a lovely twisting shape to it. Too bad a shot of it would also include all those people, the rather dull building behind it, and that boring pine tree. However, if I could eliminate all those boring distractions, that railing would make a wonderful photo, particularly if set against a contrasting background. Thank goodness for Photoshop!”

While there are purists out there who insist that photography is narrowly defined to be whatever comes out of the camera unadulterated and not altered in any way, I am not a member of that school of thought. In my opinion, the only goal is to create an engaging image that viewers find pleasing and wish to explore on more than a cursory level.

In this regard, the purists stand on shaky ground as every digital camera comes with in-camera image-tweaking software whose settings are chosen by the manufacturer. Who can reasonably assert that their image-adjustment algorithms are “correct” and my post-photographic alterations wrong? You, of course, can decide for yourself to which camp you wish to pledge your allegiance.

Unfamiliar Color, Texture, Setting

Photo manipulation software, such as Photoshop or Luminar (the one I use), are invaluable for turning a boring photo into a work of art. Again, the goal is to create a captivating image, and if adding texture or altering color or mixing photos together to alter context gives your photo that captivating touch, then do it.

Experiment

Don't be afraid to try unusual photographic techniques. For example, does every photo need to be in pin-point sharp focus? Perhaps not if your subject is colour in which case blurring the object until unrecognizable could help the viewer focus on what it was that moved you – the colour itself.

- What would result if you gently moved your camera up and down during the exposure?
- What would result if you simultaneously zoom and take a shot at the same time?
- What would result if you set your camera on to its "bulb" setting (i.e. the shutter stays open until you decide to close it), pointed it toward the sky on a clear moonless night, and left it open for a minute?
- What would result if you shone the beam from a laser pointer through a glass of water tinted with red food dye?
- What would result if you set your shutter speed to two seconds, pointed your camera toward your home's lit Christmas lights, pressed the shutter button, and for the next two seconds moved your camera in a figure eight?
- What would result if the only lens you took out with you was your super wide-angle and you use it for all manner of shots, not just the landscape panoramas typical of such a lens?

Clearly, the possibilities for creating unfamiliarity for viewers are as limitless as your imagination, so don't be afraid to let it run amok – after all, if it doesn't turn out, simply press delete and try some other crazy technique!

What helps make a good photo?

There are no universal rules that guarantee interesting photos. However, what follows are some considerations that could, in many instances, improve the quality of your work:

1. **Keep it simple;** your subject made obvious.
2. **Eliminate clutter;** your subject against a busy background, particularly if in focus, is usually a recipe for viewer confusion and eye fatigue.
3. **Get closer;** filling the frame with your subject often produces a winning result.
4. **The rule of thirds;** for whatever reason, photos with subject matter clearly divided into thirds hold appeal. For example, a shot that includes the land in front of you, a body of water above the land, and sky above the water, if divided into roughly equal thirds has a symmetry that viewers tend to find appealing – don't ask why! Is this a universal winner – of course not, nothing in photography is – but in many instances it can help.
5. **Clearly share your emotions;** you reacted to a scene emotionally, enough to want to take a photo of it. Now, through carefully thought-out decisions on exposure, lighting, perspective, and setting, capture and emphasize those aspects of the subject that caused your emotional reaction.

6. **Pick your times;** for most outdoor subjects the best light of the day is to be found during the hours around dawn and dusk. Mid-day sun is often too harsh and because it comes from directly above it provides little opportunity for interesting shadows and contrasts.
7. **Own the main tools of the trade;** close-ups require a macro lens (and benefit further from extension tubes), shooting something in the distance requires a long zoom or telephoto lens, and capturing a wide field of view (or distorting the stuff close to you) requires a wide-angle lens. Without the proper tools your ability to indulge your full creativity will be limited and, in many instances, you simply will not be able to take the shot you desire.
8. **Use Manual shooting mode;** shooting in Automatic mode is certainly easy but you can't expect to translate your vision into great photos if your camera is making all of the key decisions about shutter speed, aperture opening, flash use, etc. etc. In Manual mode, you are in full control.
9. **Use a tripod;** unless your artistic goal is to put your subject out of focus, it is good practice to use a tripod or, at the very least, a monopod. As a general rule, use a tripod if the shutter speed is going to be less than the focal length of your lens expressed as a fraction. For example, let's say you are using a 50mm – 250mm zoom lens and have it at maximum telephoto (i.e. at 250mm). If your shutter speed is more than 1/250th of a second it is unlikely your hands will be steady enough to prevent lens-shake from resulting in a blurry image.
10. **Buy photo-manipulation software;** computer manipulation of an image is truly an art form unto itself and is often the key to turning good photos into great photos. In addition, you will be amazed at how much additional information your images contain, invisible to your unaided eye, until brought out through photo manipulation.
11. **Deconstruct the world;** practice looking beyond the objects before you to find the lines, angles, parallels, curves, shapes (triangles, circles, ovals, etc.), intersections, colours, textures, patterns, shades of light and dark, reflections, and contrasts inherent in such objects.
12. **See the world in Photoshop terms;** consider what could be done with a scene with your photo manipulation software.
13. **Be in "Framed Photo" mode;** try to envision a scene being made into a large print, put in a nice frame, and hung on your living room wall. In your mind's eye, how does it look in the frame? Should your shot be composed differently to improve its look? Try this: put your hands out in front of you and use them to make a frame to bracket your subject; include and exclude different parts to try to improve the composition.
14. **Wear your go-to-hell clothes when out on a shoot;** face it, if you're on the ground to get a great shot (and this is often where you're going to be) you're going to get dirty. If you're in your good clothes, you're going to miss that shot (or waste a lot of money on dry cleaning)!
15. **Notice other artists' work;** take note of others' photos, paintings, sculptures, and architecture and what it is about them that grabs and holds your attention; ideas that you can then incorporate into your own work.
16. **Make it Black & White;** if colour is not an important component of your shot, try shooting in B&W or convert the image to B&W during image processing.

You Are Unique – The World is Lucky to Have You!

What sets you apart from everyone else in the world is that only *you* have experienced what *you* have experienced and those unique life experiences have made you who you are today – one of a kind! As a result, *no one else is going to react to the world in exactly the way you do.*

Because of this, your photos (if taken in seeing mode) will be totally unique, reflecting who you are and how you relate to the world around you.

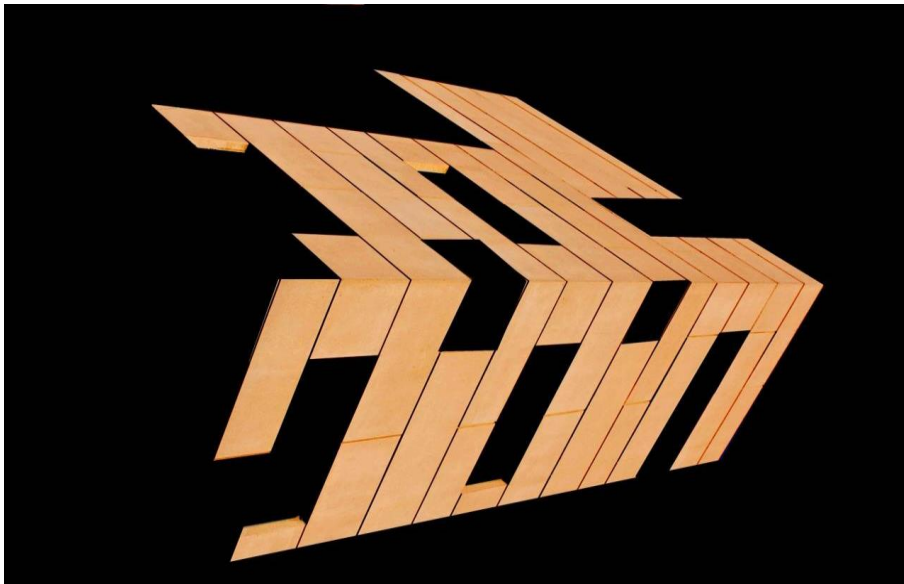
In short, *you have a unique story to tell the world through your photos that no one else can!* So get out there with your camera, see the world through your unique life lens, and show the world who you are and what they would have missed were it not for you. Have fun!

Examples of the Unfamiliar

This photo of fall leaves was taken using the “Shoot-while-zooming” technique (note the lines, colours, and differing areas of brightness):



This photo of the corner of an office building is rendered unfamiliar via photo manipulation that removes portions of the scene:



This is a photo of the underside of a mushroom rendered unfamiliar via close-up and enlargement (note also the lines, curves, shades, and texture):



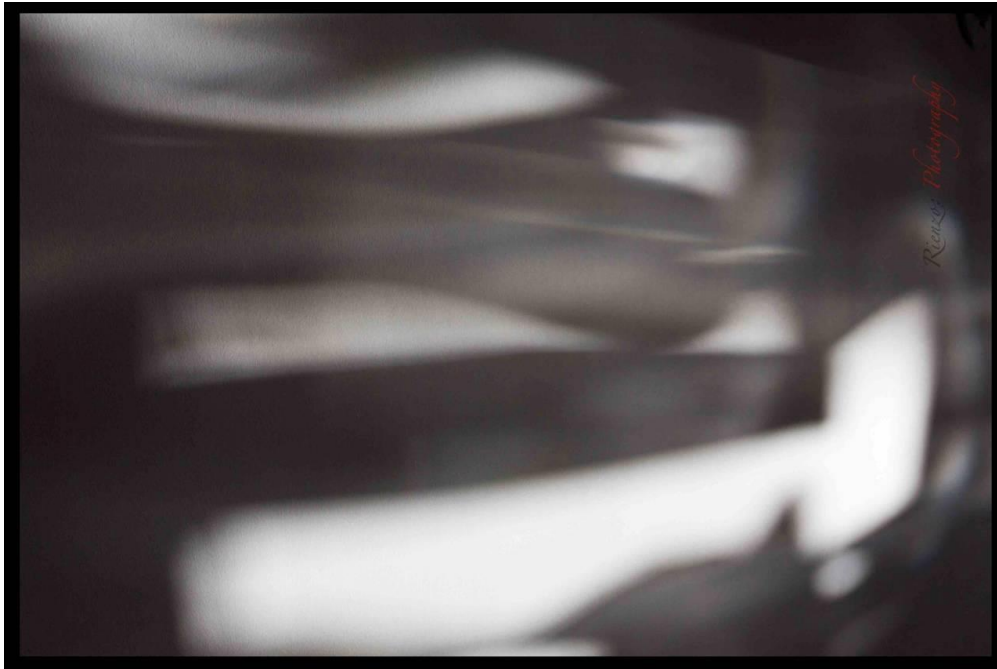
Here a scene of tulips is rendered unfamiliar via a change of vantage point (ground level in this case). Note the use of contrast, a sole yellow tulip amid a bed of red companions:



This photo of an apartment building in Chicago is rendered unfamiliar via tilting the photo to the right as well as zooming in on a small portion of the whole to focus on the building's lines, patterns, curves, and contrasts of dark and light as well as areas of colour and non-colour.



Here sunlight falling on our basement floor is rendered unfamiliar via focus on the simple shades of light and dark:



Exposure: Part 1

- **Exposure:** Refers to how much light you choose to reach the camera's sensor through conscious decisions about the size of the aperture opening, the shutter speed, and the ISO film speed (see a discussion of ISO below). Of course, if not shooting in Manual mode, the camera itself will make these exposure decisions for you (though this is far from ideal as it removes your personal touch and so a great deal of the artistry that goes into a great photo).

Too little light is said to be “under-exposed” and results in a dark image. Too much light is said to be “over-exposed” or “burnt out” and results in an overly-bright image.

- **Iris:** Similar in function to the iris in your eye, this controls the size of the opening through which light enters your camera.
- **Aperture:** This is the size of the opening in the iris; the larger the aperture, the more light enters the camera. The minimum aperture that a given lens will permit is printed on the front of the lens, usually as a ratio in this format: 1:5.6, this meaning that the smallest aperture permitted with such a lens is an f-stop of f/5.6 (see a description of f-stop below).

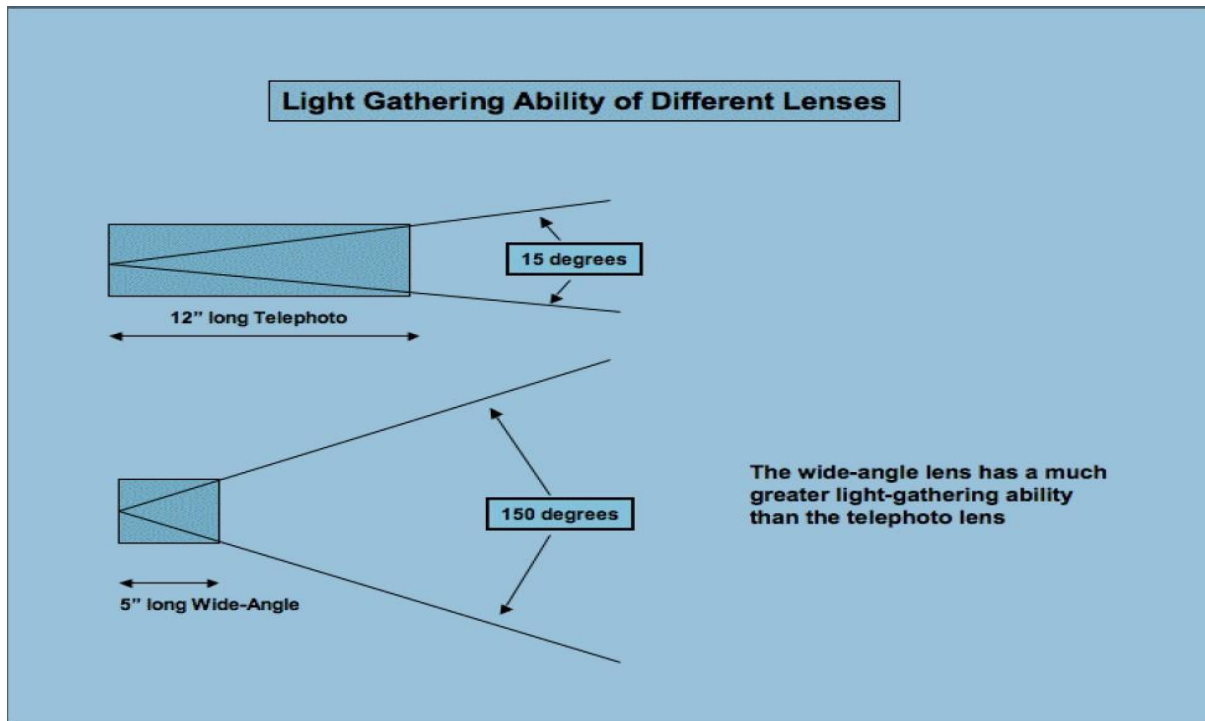
For a zoom lens, the minimum aperture will depend on the focal length, so both the minimum aperture with no zoom and the minimum aperture at maximum zoom are shown on the front of the lens (e.g. 1:2.8 – 5.6). This means that if no zoom is being used, the minimum f-stop permitted is f/2.8 but at maximum zoom it is f/5.6.

- **F-stop:** This is a relative measure of how much light will enter the camera. Each successively higher f-stop halves the amount of light. Standard f-stops are: f/1, f/1.4, f/2, f/2.8, f/4, f/5.6, f/8, f/11, f/16, f/22, f/32, and f/44. For example, f/4 will let in double the light of f/5.6 which, in turn, will let in double the light of f/8.

On DSLRs (i.e. a Digital Single Lens Reflex camera), if you select either the aperture-priority or manual shooting mode you are able to choose your desired aperture opening. However, you do so not by selecting the aperture diameter directly but, instead, by selecting a seemingly arcane measure called an f-stop.

Why is this? Would it not make more sense to be able to select the aperture diameter directly rather than have to think in terms of f-stops? While this would make sense if it were it possible, unfortunately it is not, and this is why:

Think of two lenses, the first a super-telephoto lens twelve inches long with an 800mm focal length. The second is a wide-angle lens five inches long with a 15mm focal length. As shown below, the longer the lens the less light it lets in:



If cameras displayed aperture openings directly rather than f-stops, then a given aperture opening would let in more light if a wide-angle lens were being used than if a telephoto lens were being used; the aperture opening on its own would not help you gauge whether your exposure was going to be bright or dark; the result would also be dependent on the focal length of the lens you were using.

Because an f-stop is calculated by dividing the aperture opening into the lens focal length, it takes both into account. As a result, no matter what type of lens you are using, the f-stop scale provides you with a comparable measure of light-gathering ability.

- **Shutter speed:** Typical shutter speeds range from a very fast $1/4000^{\text{th}}$ of a second to 30 seconds (and there's even a "bulb" setting that keeps the shutter open until the shutter button is pressed again). Each shutter speed increase or decrease is typically measured in $1/3$ f-stop equivalents. For example, going from $1/400^{\text{th}}$ of a second to $1/200^{\text{th}}$ of a second – doubling the amount of light – progresses as follows: $1/400^{\text{th}}$, $1/320^{\text{th}}$, $1/250^{\text{th}}$, $1/200^{\text{th}}$. Each change is the equivalent of changing the aperture opening by $1/3$ of an f-stop. Because going from $1/400^{\text{th}}$ of a second to $1/200^{\text{th}}$ of a second doubles the amount of light permitted into the camera, this is the equivalent of doubling the aperture area (i.e. opening it up by one full f-stop).

- **ISO:** ISO is the acronym for the International Organization for Standardization, an international body that coordinates the uniformity of technological standards worldwide. While IOS would make more sense in English, being an international body, the decision was made to opt instead for ISO.

When film cameras predominated, you could buy film with different sensitivities to light – some would react to light faster than others. This reaction time was designated by the film's ISO number, the bigger the number the faster the film would react to light.

Standard ISO options on today's DSLRs are ISOs of 100, 200, 400, 800, 1600, and 3200 (with some cameras going much higher). As you can see, each successive ISO number is double the previous one. The reason for this is to make it clear that each successively higher ISO setting doubles the amount of *light gathered per second* relative to the previous ISO setting.

For example, at any given shutter speed a 200 ISO setting will make the digital sensor react twice as fast to light as at a 100 ISO setting. We can relate this faster reaction time to f-stops and shutter speed as follows:

Assume a change in ISO from 100 to 200. This is the same as doing either of the following:

1. Increasing the aperture by going down one stop (e.g. f/4 to f/2.8 which doubles the amount of light entering the camera).
2. Slowing the shutter speed by half (e.g. from 1/400th of a second to 1/200th of a second which lets in twice the amount of light).

In this manner, aperture setting (via f-stop), shutter speed, and ISO are the three main variables for controlling the amount of light reaching the camera's sensor and, hence, creating your desired exposure.

One of the advantages of a high ISO setting is that under dim lighting conditions a faster shutter speed can be used, thus reducing the likelihood of shaky hands ruining your shot.

The downside of higher ISO film used to be a grainier image, but with today's sophisticated digital noise suppression software there is little image deterioration at higher ISO settings under typical viewing or print conditions.

- **Exposure Level Indicator:** This appears in your viewfinder when the shutter button is half depressed. It is a line segmented into thirds of an f-stop (see f-stop discussion). If the indicator is in the middle at zero, the image will be at 50% middle gray brightness (i.e. half-way between pure white and pure black) as determined by the camera's built-in light meter and software algorithm.

Moving the pointer to -1 means that you have just reduced the amount of light to the equivalent of one full f-stop, which halves the amount of light entering the camera relative to the middle position. Moving to -2 cuts the light by a further half (i.e. one-quarter the light of the middle position).

Going the other way, adjusting the pointer to +1 doubles the amount of light relative to the middle position while +2 doubles the amount of light again (i.e. four times the light of the middle position).

Once you select a specific aperture opening, adjusting the exposure with the adjustment dial alters the shutter speed (faster = darker; slower = brighter).

- **Brightness terminology:** Dark areas in an image are referred to as "shadows", bright areas as "highlights" and all other areas as "mid-tones". Photo processing software is able to manipulate all three types of areas to enhance contrast. Pure black is assigned a brightness measure of 0 whereas pure white is assigned a brightness measure of 100¹. A brightness of 50 is referred to as "middle gray" which is the level of brightness a camera's software attempts to achieve with every shot if you shoot in auto mode. If you shoot in manual mode, middle gray is the exposure the camera suggests you use (that you can, of course, over-ride for artistic purposes).
- **Clipping:** Refers to those portions of a photograph that are either so bright or so dark that no image information exists in these areas – a potentially critical blemish that can ruin an otherwise great photo. While photo manipulation software can help remedy mild cases of clipping, major clipping, particularly over-exposure, simply cannot be fixed and so is to be avoided during the shooting phase through proper exposure decisions.

¹ Another brightness scale known as "Levels" goes from 0 (pure black) to 255 (pure white), with middle gray coming in at 128.

Controlling Exposure

As outlined above, exposure is how much light you permit to reach the “film” (i.e. the camera’s digital sensor) through manipulation of your camera’s aperture opening (via f-stop setting), shutter speed, and ISO film speed setting.

Too much light and your photo is just white nothingness – burned out or clipped in the parlance of photography; too little light and it’s just all blackness. Your goal as an artistic photographer is to decide how much light *you* want in your photo to best express what it is *you* see and what it is *you* wish to convey to your viewers.

So, here are the main ways to control the amount of light (i.e. your exposure):

1. **Aperture:** As mentioned above, aperture is the size of the hole in the iris that lets light into your camera; the bigger the hole the more light can enter.

Also as mentioned above, the standard measure of how much relative amount of light is coming into the camera, is known as an “f-stop”, and is defined as follows:

$$\text{f-stop} = (\text{Lens focal length}) / (\text{Aperture diameter})$$

As a result, as aperture diameter increases, the f-stop number – the measure of the relative amount of light entering the camera – actually decreases, despite the fact that more light gets into the camera – a source of endless confusion for many a photographer!

The standard f-stop settings are:

f/1, f/1.4, f/2, f/2.8, f/4, f/5.6, f/8, f/11, f/16, f/22, f/32, and f/44.

While the choice of these particular numbers may seem completely whacky, there is a very good reason for their selection, this being that these f-stop numbers, representing the ratio of lens focal length to aperture diameter, result in a doubling of the area of the aperture with each successive f-stop and so a doubling of the amount of light permitted to enter the camera.

So, starting from f/1, each successive f-stop lets in half the light of the previous f-stop; f/8 lets in half the light of f/5.6; f/32 lets in half the light of f/22.

In Aperture Mode or Manual Mode, you control the f-stop – you control the size of the aperture and, hence, the amount of light entering the camera.

2. **Shutter speed:** No surprise here – the faster your shutter closes, the less light that’s going to make it into your camera. At 1/2500th of a second, little light is going to make it through but at 1/25th of a second, quite a bit will (unless you’re in a dimly-lit room, in which case even slower shutter speeds will likely be required to produce a properly-exposed image). If you halve the shutter speed, you halve the amount of light – 1/100th of a second will let in half the light of 1/50th of a second.

3. **ISO setting:** Today's digital camera's have carried over the ISO concept. For a given shutter speed, a larger ISO setting will make the sensor absorb more light. For example, if the shutter speed is set for 1/250th of a second, the photo will be brighter if you use an ISO setting of 1600 relative to an ISO setting of 200.

While higher ISO film used to produce grainier photos, today's digital cameras are so advanced that there is little noticeable difference in quality between ISO 100 and ISO 1600. As a result, don't hesitate to adjust the ISO setting if your desired exposure requires it.

Here is a guide to manipulating the brightness of your photos:

- **BRIGHTER:**
 - **Slower shutter speed &/or**
 - **Larger aperture (i.e. smaller f-stop: e.g. f/2.8 instead of f/18) &/or**
 - **Larger ISO setting (e.g. ISO 400 instead of ISO 100).**
- **DARKER:**
 - **Faster shutter speed &/or**
 - **Smaller aperture (i.e. larger f-stop: e.g. f/22 instead of f/4) &/or**
 - **Smaller ISO setting.**

Of course, there is also the option of adding light to your scene via flash, lighting, or reflectors. Note that built-in camera flashes have a tendency to produce rather harsh light and unwanted shadows and so should be used sparingly. More sophisticated camera flashes (i.e. more costly) permit the flash to be aimed away from the subject and the light bounced off a surface (e.g. a wall, ceiling, or purpose-made reflector) on to the subject, this being preferable as it softens the light. Most DSLRs also permit the intensity of the flash to be adjusted.

Exposure Control Levers

| | Aperture | Shutter Speed | ISO | |
|----------|----------|---------------|-------|----------|
| Brighter | f/1 | 1/2 | 25600 | Brighter |
| | f/1.4 | 1/4 | 12800 | |
| | f/2 | 1/8 | 6400 | |
| | f/2.8 | 1/15 | 3200 | |
| | f/4 | 1/30 | 1600 | |
| | f/5.6 | 1/60 | 800 | |
| | f/8 | 1/125 | 400 | |
| | f/11 | 1/250 | 200 | |
| Darker | f/16 | 1/500 | 100 | Darker |

NOTE: Moving from one Aperture level to another has the same exposure impact as moving the same number of shutter speed or ISO levels.

Exposure: Part 2

- **Metering:** Metering means measuring the amount of light coming from the scene into the camera. The camera's built-in light meter measures both the amount of light reflected off your subject as well as the amount of direct light from a light source (e.g. a light bulb or the sun). In Automatic shooting mode this information is used by the camera's software to determine what combination of shutter speed, aperture opening, and ISO is required to render the scene 50% bright (also known as "middle gray").²

This is why a photo of snow taken in Automatic shooting mode looks gray. The camera senses a lot of light and so adjusts the exposure settings to darken the image to achieve 50% gray. Conversely, a shot of a navy blue car parked inside a dimly-lit garage is automatically brightened up by the camera – it senses a dark scene and so adjusts the exposure settings to let in more light so as to brighten the image up to achieve 50% gray.

In both instances, to render these scenes more realistic, you would need to alter the exposure from that suggested by the camera. You would over-expose for the snow (to let in more light than that suggested by the camera and so render the snow white rather than gray) and under-expose for the car (to let in less light than that suggested by the camera and so render the car as correctly dark). This is known as "stopping up" (for the snow) and "stopping down" (for the car).

- **Metering mode:** DSLRs provide options on how much of a scene and/or what parts of a scene are to be used to determine the "best" exposure settings (i.e. shutter speed, aperture opening, ISO setting). For example, my Canon DSLR offers the following options:

1) *Evaluative:* the camera's software surveys the entire scene to assess the mix of dark and light areas and uses its proprietary algorithm to select an exposure that it feels will result in the "best" exposure. In other words, it tries to prevent blown-out over-exposed areas as well as overly-dark under-exposed areas. A camera's ability to properly capture the brightest and darkest areas is referred to as its 'dynamic range'. The more expensive the camera, the wider its dynamic range.

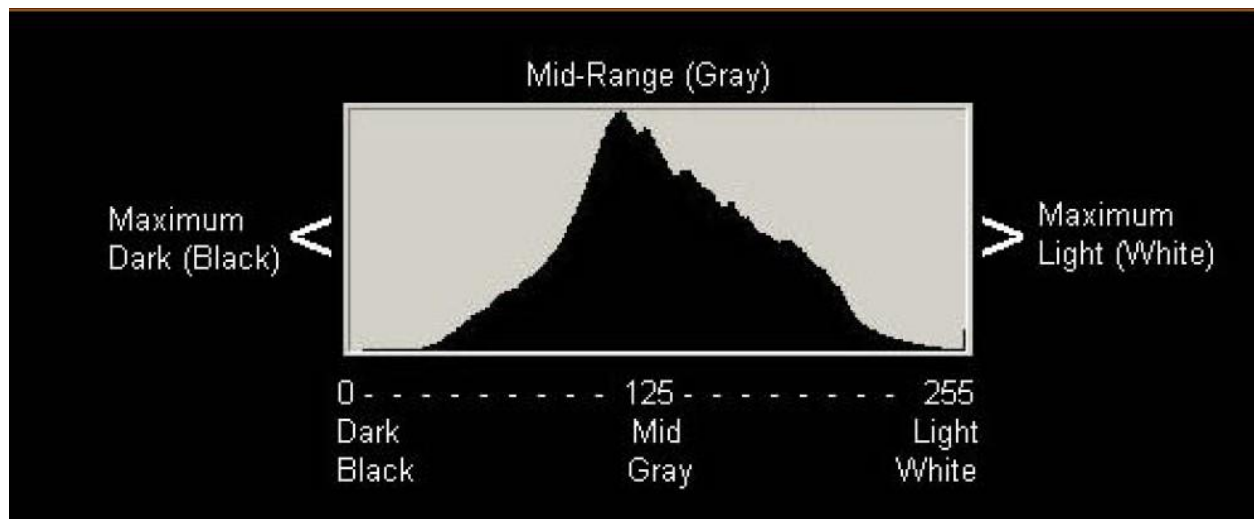
2) *Partial:* Just the central 15% of the scene is used to gauge the best exposure. This setting is useful when a subject is backlit (i.e. bright light coming from behind the subject) as the camera's light meter ignores this bright light and bases its suggested exposure on just the intended subject. If Evaluative were used in this instance it is very likely that the subject would come out too dark as the camera would sense a bright scene and so darken the image accordingly.

² Two brightness scales in common use include one that ranges from 0% (pure black) to 100% (pure white), with 50% being middle gray. An alternative scale, referred to as "Levels", uses a range of 0 to 255 with 128 being middle gray brightness.

3) *Spot*: Similar to *Partial* except only the central 3% of the scene is used to gauge the best exposure with the remainder of the scene ignored. This mode is useful when one small part of the scene is critical to the intended composition and must be properly exposed. This is an advanced mode and requires practice to get the overall picture right.

4) *Centre-Weighted Average*: this mode gives greater weight to the central 60% of the scene but then averages over the entire scene. This is the mode used by many professional photographers but, as with spot metering, requires practice to get photos to turn out looking right.

- **Histogram**: A graph (illustrated below) showing how many of the image's pixels fall into the various degrees of brightness with pure black on the far left (0% brightness and 0 on the Levels scale) and pure white on the far right (100% brightness and 255 on the Levels scale). Middle Gray falls, well, in the middle, this being the level of brightness a camera's software attempts to achieve with every shot if you shoot in auto mode or, if in manual shooting mode, is the exposure it suggests you use to achieve middle gray brightness (that you can, of course, over-ride for artistic purposes).



An image with a wide dynamic range (i.e. containing both dark blacks and bright whites) has a histogram that looks like a mountain extending to both sides of the graph. Such an image will have good contrast with bold shadows and bright areas.

An image with low dynamic range has most of the pixels falling within a narrow band. Such a photo will look rather flat and dull (which is fine if this is the effect you are trying to achieve, but for most photos this is not the ideal).

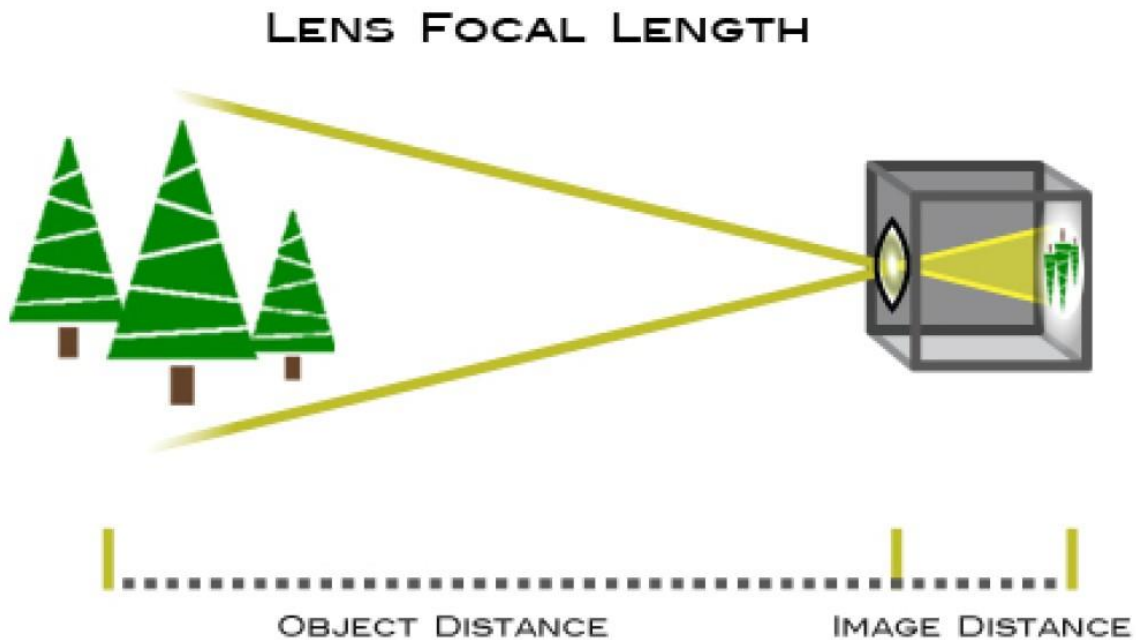
If the histogram indicates that some pixels butt right up against either side, this means that portions of the image are so dark or so bright that the information in those areas is outside of the light-handling ability of the camera's sensors. Such areas (known as clipping or burned-out areas) are usually to be avoided as they typically are not aesthetically pleasing being completely devoid of any detail.

Let's say you are shooting a bright scene and after taking the shot you check the histogram and find that there are few pixels on the right of the graph. This tells you that you need to re-shoot after first adjusting your exposure to let in more light (lower f-stop like f/2.8, slower shutter speed, higher ISO).

On the other hand, if you are shooting a dark scene and the histogram shows a lack of pixels on the left of the graph, this is telling you to re-shoot but this time adjusting your exposure to let in less light (higher f-stop like f/22, faster shutter speed, lower ISO).

Lens Characteristics

- **Focal length:** Light rays gathered by the lens converge at one spot (think of the spot of focused light that can be created by a magnifying glass). The distance between this convergence point and the camera's sensor is the lens's focal length (referred to as "Image Distance" in the diagram below).



The longer the focal length, the greater the telephoto power and the greater the magnification of objects; the smaller the focal length, the greater the lens's wide-angle capability and the minimization of objects. The focal length appears on the front of every lens.

For example, a wide-angle lens may show 12mm, a standard lens 50mm (standard meaning that our perception of distance through the lens is the same as we perceive with our unaided eyes), and a telephoto lens 250mm. As a result, any focal length less than 50mm has some wide-angle capability and any focal length greater than 50mm has some telephoto capability. A 250mm lens would make things look five times closer than reality, this simply being its focal length of 250mm divided by the focal length of a standard lens (i.e. a 50mm lens), giving us $250\text{mm} / 50\text{mm} = 5\text{x}$ magnification.

A zoom lens, this being one whose focal length can be changed, either manually or mechanically, will show two focal lengths – its shortest and longest; for example 35mm – 200mm. Such a lens provides both some wide-angle capability and some telephoto capability.

As an aside, the greater the zoom capability, the greater the likelihood that picture quality will be compromised relative to a lens with a fixed focal length. For example, a 55mm – 350mm zoom lens at maximum zoom will almost assuredly produce lower-quality photos than a telephoto lens with a fixed 350mm focal length (such a lens with no zoom capability is referred to as a “prime” lens).

- **Sensor Size & Crop Factor:** Complicating the topic of lens focal length is the fact that a camera’s sensor size impacts the lens’s *effective* focal length as only a ‘full frame’ digital camera, this being one whose sensor is the same size as the old 35mm film (i.e. 36mm x 24mm), yields the exact focal length as listed on the lens. Since full-frame cameras cost three to six times more than entry-level Digital Single-lens Reflex cameras (a.k.a. DSLRs), they are typically the domain of professional photographers.

Typical consumer-oriented camera sensors are smaller than those of full-frame cameras. For example, a Canon full-frame camera’s sensor has a diagonal that is 1.6x longer than that of one of Canon’s consumer models. This is referred to as a ‘1.6 crop factor’. A typical consumer Nikon camera has a crop factor of 1.5.

One advantage to a smaller sensor is that it multiplies the magnifying power of each lens. For example, a 100mm focal length lens attached to a small-sensor camera would provide the same magnification as a 160mm lens attached to a full-frame camera (i.e. 1.6 crop factor x 100mm lens focal length).

On the downside, a 10mm wide-angle lens on a small-sensor camera is not going to have as much wide-angle capability because its effective focal length, assuming a 1.6 crop factor, is 16mm (i.e. 1.6 crop factor x 10mm lens focal length).

It follows from this that, with a 1.6 crop factor, an equivalent ‘standard’ lens is a 35mm lens, not a 50mm lens, because $35\text{mm} \times 1.6$ comes to 56mm, close enough to 50mm to give our eye the perception that what we see through the lens is roughly life-size.

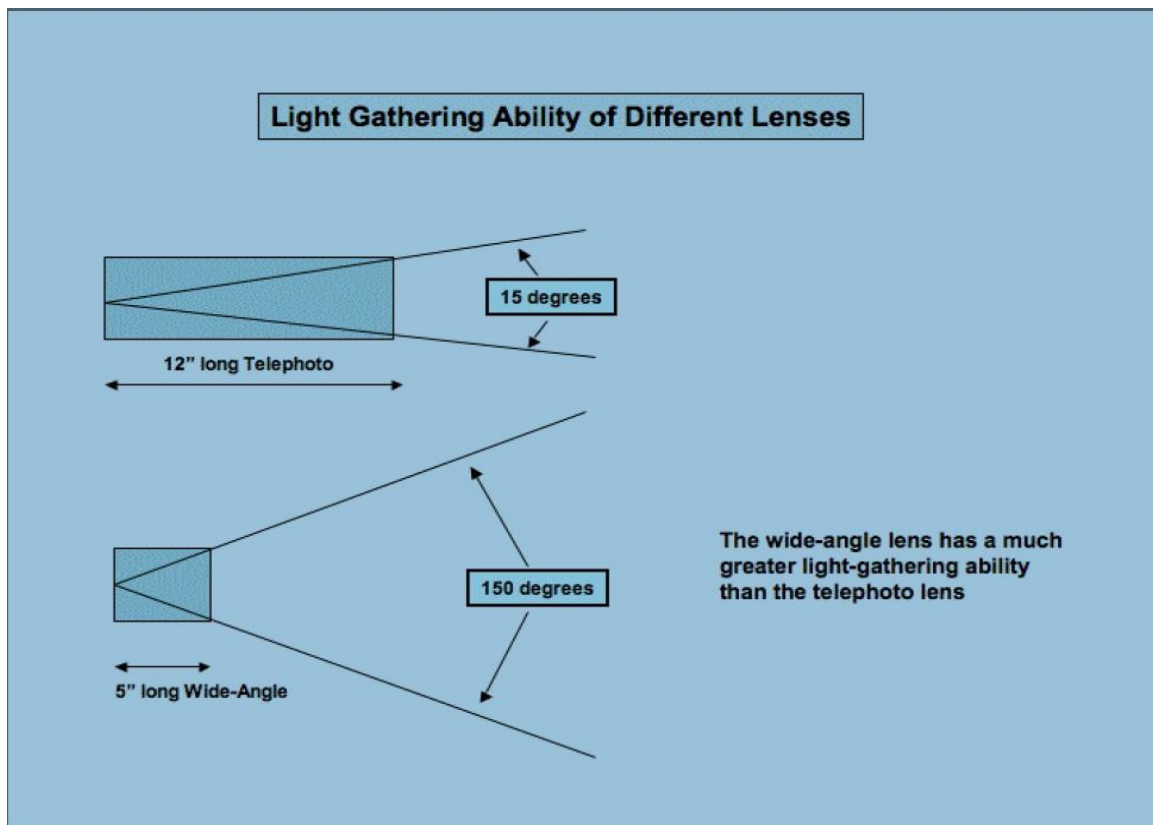
It is important to note that some lenses are specifically crafted for small sensor cameras and will not work on a full-frame camera. The reason for this is that the light hitting the sensor is shrunk to match that of the small sensor. If mounted on a full-frame camera, only part of the sensor would be covered by the light, thus leaving a black boundary around the image.

As one example, the Canon EF-S line of lenses only work on their small-sensor cameras and, indeed, cannot even be mounted on their full-frame cameras. Their EF line of lenses on the other hand are compatible with both their small sensor and full-frame cameras.

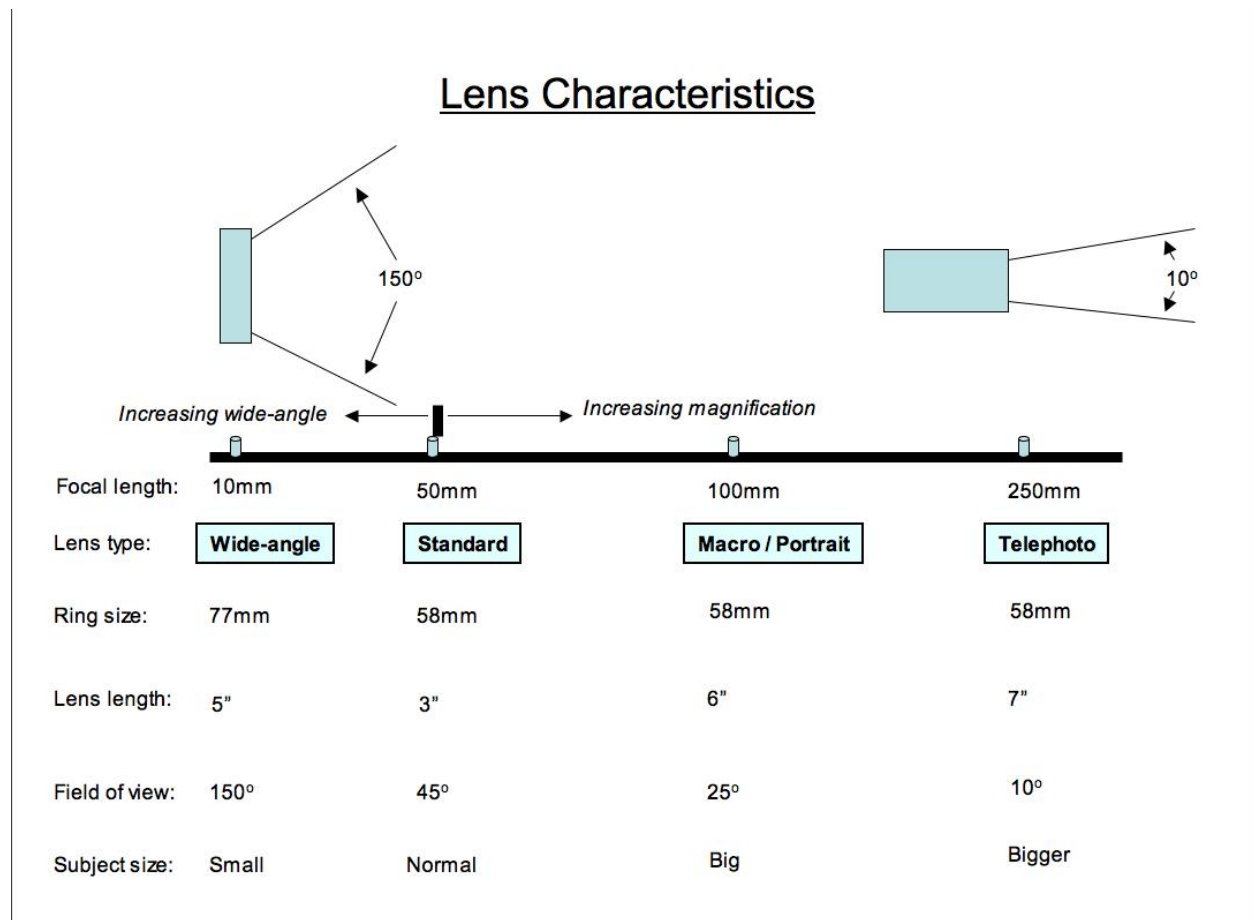
Therefore, if you are collecting a range of lenses and have any inkling of moving up to a professional full-frame camera, be sure to only buy those lenses that are compatible with a full-frame camera as they can still be used with a small sensor camera (part of the image captured by the lens will not be visible to you through the viewfinder but you won't know this is occurring and it won't impact your photo).

Be warned however that lenses compatible with full-frame cameras cost more – often a lot more – because their lens must be bigger to match the bigger sensor. This also means they are heavier than small-sensor lenses. For example, the Canon extreme 1200mm telephoto lens weighs in at a bruising 36 pounds!!

- **Light gathering ability**



○ **Lens characteristics**



Field of view: This is the breadth of area visible through a lens. The shorter the focal length, the greater the field of view. This is why wide-angle lenses have focal lengths in the 15mm range. This is illustrated in the graphic shown above.

Shooting Modes

- **Shooting Modes – Basic & Advanced:** In an effort to entice casual photographers to their products while still attending to the needs of serious amateurs, DSLRs offer both basic and advanced shooting modes. The basic settings render the act of taking a photograph as simple as point-and-shoot, leaving decisions on aperture, shutter speed, and ISO to the camera's algorithms. Needless to say, while pretty much foolproof for taking snapshots, by taking important creative decisions out of the hands of the photographer and leaving them up to the camera, basic settings do not lend themselves well to photography as an art form.

Basic Settings

- **Automatic:** The camera sets the aperture, shutter speed, and ISO. It may also accentuate the vividness of colours and add a little sharpening to the image. Many advanced features are deactivated.
- **Portrait:** This is the same as Automatic but with a softer focus to de-emphasize skin imperfections and make hair look softer.
- **Landscape:** This too is the same as Automatic but with blues and greens made more vivid.
- **Macro:** This permits the camera to focus at closer distance to the subject but in all other aspects is the same as Automatic.
- **Action:** This is also the same as Automatic but with a faster shutter speed to “freeze” a moving subject. To accommodate a faster shutter speed (that lets in less light and so could make the subject appear too dark), the camera selects a larger aperture (lower f-stop to let in more light) and higher ISO (to have the sensor react to light faster).

Advanced Settings

Tv (Shutter Priority): The user selects the shutter speed and ISO³ leaving the camera to select the “correct” aperture to achieve the “correct” exposure. This is not a commonly used setting, mainly selected for specialty shots like blurring a waterfall to give it the appearance of a smooth curtain of water or keeping the shutter open long enough to capture exploding fireworks whose timing is unpredictable, thus frustrating attempts to press the shutter button at just the right time.

Av (Aperture Priority): The user selects the aperture (i.e. f-stop) and ISO (unless ISO is set on Automatic) leaving the camera to select the “correct” shutter speed. This is a more commonly-used mode than Shutter Priority because more often than not one of the main artistic decisions is how much depth of field is desired to achieve a specific artistic goal (with blurring of the background being one of the most common goals).

³ On most cameras ISO can also be set to Automatic, in which case the camera will select this as well.

P (Program mode): This is the same as the Automatic setting in Basic Settings except that advanced features are not de-activated and so remain under the control of the photographer.

Manual: The user selects the aperture (f-stop) and then selects the shutter speed required to achieve their desired artistic exposure (via adjustments to the Exposure Level Indicator). As all key decisions are under the control of the photographer, this mode is strongly recommended for achieving maximum artistic expression.

Depth of Field

Depth of Field refers to how much of the scene in front of your subject and behind your subject will be in focus. Often in photography the background behind your subject is not important to the shot and, in many instances, can actually be an unwanted distraction. In this case you want a shallow depth of field with your subject in focus and the stuff behind it pleasantly blurred to avoid distraction.

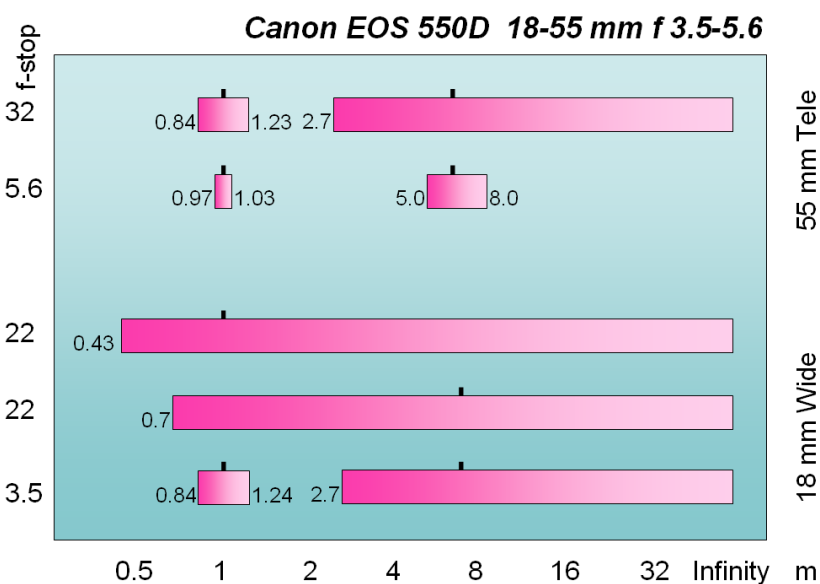
In this regard, the bigger the aperture (small f-stop, like f/1.4), the shallower the depth of field. For example, an aperture setting of f/4 will leave more background out of focus than f/11.

This is another reason why 'fast' lenses (i.e. those that let light through more easily) are preferred over (and cost more than) 'slow' lenses; they provide much greater ability to control the depth of field, usually to blur the background in a shot.

Another factor is the degree of magnification of the lens. Both macro lenses and telephoto lenses (or zoom lenses with telephoto capability) naturally have small depths of field and require large f-stops (e.g. f/22) to achieve any material depth of field.

At the other extreme, wide angle lenses naturally have large depths of field (one of their benefits for photographing panoramic scenes like landscapes where the entire scene is usually of interest and to be in focus). Even a small f-stop (e.g. f/2.6) is unlikely to provide much blurring of a background with a wide-angle lens.

The graphic below is a depth-of-field chart for a Canon 18-55 mm zoom lens under eight different shooting scenarios. The black tick marks above each bar indicate how far away the subject of the photo is from the camera. For example, the top-left bar illustrates a subject located one metre away from the camera.



Here is how we interpret this graph:

Bar #1: Top-left

The lens is set to its 55mm focal length (i.e. mildly telephoto). The f-stop is set to f/32. The object being photographed is 1 metre away from the camera. Under these conditions, the area in focus will be from 0.84 metres away to 1.23 metres away.

Bar #2: Top-right

The set-up is the same except the object is now 7 metres away from the camera. As shown, the depth of field (i.e. the area in focus) is now from 2.7 metres away to infinity.

Bar #3: Left side, second row

The same set-up as #1 but now the f-stop is set to f/5.6, this being a larger aperture opening than f/32. As shown, the area in focus is smaller, only from 0.97 metres away to 1.03 metres away. Pretty much the only thing in focus given this tight range is the subject itself.

Bar #4: Right side, second row

The set-up is the same as for Bar #3 except the subject is now 7 metres away from the photographer. The depth of field, 5 metres to 8 metres, is considerably smaller than Scenario 2 where the f-stop was f/32 instead of f/5.6.

Based on the above, you can work your way through the interpretation of the remaining scenarios, but the main conclusions are as follows:

- The larger the f/stop (i.e. f/32 vs. f/5.6), the greater the depth of field.
- The greater the distance the subject is from the photographer, the greater the depth of field.
- The greater the light-gathering ability of the lens (i.e. wide-angle vs. telephoto) the greater the depth of field.

So, to increase depth of field:

- **Increase the f-stop (e.g. f/8 vs. f/2.8).**
- **Increase your distance from the subject you are shooting.**
- **If using a zoom lens, increase its light-gathering ability by moving into its wide-angle range rather than its telephoto range.**

Conversely, to decrease depth of field:

- **Decrease the f-stop (e.g. f/4 vs. f/16).**
- **Decrease your distance from the object you are shooting.**
- **If using a zoom lens, decrease its light-gathering ability by moving into its telephoto range rather than its wide-angle range.**

White Balance & Image Formats

- **White Balance:** Light is not a uniform colour; it comes in a variety of frequencies with each appearing as a different colour to our eyes. In order of frequency from lowest to highest: red, orange, yellow, green, blue, violet, ultra-violet (i.e. “black” light). The lower the temperature of the light source, the lower its frequency and the more red/orange it appears, a characteristic referred to as “warm light”.

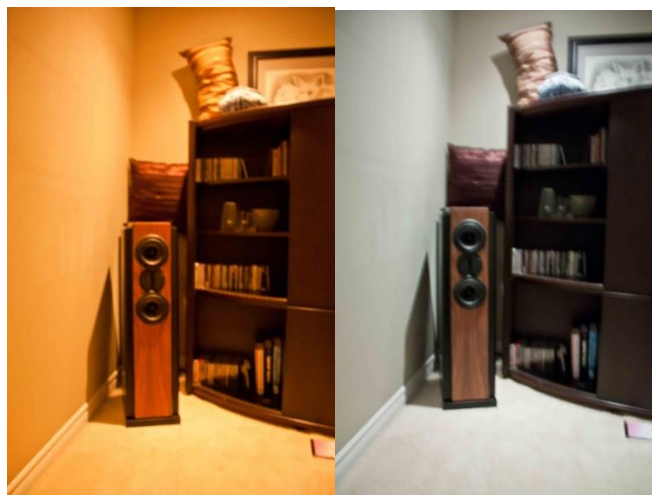
For example, a log fire burns at about 1000C and so casts a warm orange light. On the other hand, an oxy-acetylene torch burns at about 3000C and so casts a bluish light (known as “cool light”).

Despite these different colours of light, a white page of paper will appear white to our eyes whether in sunlight, shade, candle light, fluorescent light, etc. because our brain makes sure we always perceive colours as we expect them to be.

However, a camera’s software is not as smart as a human brain. If you take a photo in a room lit by a standard light bulb, known to produce low-frequency and, hence, warm light, it is likely to have a distinct orange tinge to it (known as a colour cast – see the image below). The picture will appear odd as it does not look like what we perceive with our eyes. What is happening is that your camera’s sensor is having a difficult time knowing what the colours should look like to you and I under such lighting.

White balance refers to the adjustment of such a photo, either before or after it is taken, to render it as being “true” as perceived by our eyes.

One means of doing so before taking the shot is to place a purpose-made white photo card in your scene, take a shot of just it, and then use your camera’s custom white balance process to essentially tell the camera, “this is what white looks like under these lighting conditions. Please adjust all the other colours in my scene relative to what you now know to be white.”



Not White Balanced

White Balanced

Alternatively, you could take a preliminary shot of your scene that includes a purpose-made 18% gray card⁴ (see the image below). During photo processing you can then use your software to adjust the white balance in all photos taken of the same scene. Your photo software references the gray card from the preliminary shot (this will make more sense when you actually try it!). Note that this method won't work for any shots taken under different lighting conditions than what existed during the shot of the 18% gray card.



If your shot is already taken and you didn't use the Custom White Balance method or make use of an 18% gray card, most photo manipulation software can help render the scene more realistic by removing much of the artificial colour cast. However, its ability to do so is somewhat limited relative to the other methods discussed here.

⁴ A gray card with 18% brightness appears to human eyes to be 50% brightness, this being the brightness level your camera is trying to achieve when it chooses or suggests an exposure. For whatever reason, humans tend to favor photo subjects developed to 50% brightness, any deviations from this perceived to be "off". Again, artistic vision should typically trump such rules of thumb.

Two Common Image Formats

- **JPEG:** This is the most widely-used photo image format, but not the best for serious photographers due to its weaknesses relative to the RAW image format (see below): Relative to a RAW image format, JPEG (also referred to as JPG) images have the following weaknesses:

1. Less colour information.
2. Some pixels are eliminated resulting in reduced image information and, therefore, reduced ability to adjust the image with photo software.
3. Reduced file size.
4. Lower dynamic range.
5. Image data is lost each time the photo is edited.
6. Fewer editing options than with the RAW image format.

On the other hand, JPEG images are easier to use as they typically require no processing to make them look good (unlike a RAW file which, to look its best, really must be processed). In addition, the JPEG format produces sharper images than RAW (although photo software can be used to sharpen RAW images).

- **RAW:** The image format of choice for serious photographers as it does not suffer from the JPEG weaknesses listed above.

Useful Camera Gear

While a walk through any camera shop will quickly prove overwhelming, what with all the gadgets available to photographers today, here is a short list of some of the more useful kit to consider:

- **Battery grip:** As its name implies, a battery grip serves two useful functions: 1) It packs additional battery power to keep your camera running longer. 2) It serves as the perfect grip when you wish to take a vertical shot. 3) It possesses both an additional shutter button as well as an additional dial to alter camera settings to greatly facilitate vertical shots.
- **Tripod:** Without a tripod, your shaking hands will inevitably ruin what could have been great shots. Don't cheap out here – get a good one because proper stability comes at a price.
- **Camera bag:** In addition to holding your camera and accessories, when shooting on cold days it also protects your camera's sensitive electronics from moisture condensing on the components (provided the camera bag is zipped closed before coming inside from the cold). In short, never bring a cold camera into a warm room or you will court disaster.
- **Lens tissue:** Lenses get dirty over time; lens tissue is designed to permit you to gently wipe away accumulated grime without scratching the lens.
- **Lenses:** The main choices are: wide angle (~12mm), telephoto (or long zoom) (~200mm +), macro (a.k.a. close-up) (~100mm), and standard (~50mm).
- **UV filter:** Designed to filter out ultra-violet light that can give your photos a bluish tinge in bright light. While most of today's cameras can deal with this issue without the need for such a filter, the additional piece of glass can help protect your camera lens from accidental damage. On the downside, the extra piece of glass may also compromise the quality of your images. For most photographers, the protection value *probably* offsets image quality reduction.
- **Lens hood:** A lens hood prevents side light from entering the camera lens and creating what are known as "flares" in the image. Like a UV filter, they also help protect your lens from accidental damage.
- **Remote control:** If you enjoy macro (a.k.a. close-up) photography, elimination of camera shake is essential. A remote control is a very low-cost item and, by taking your hands off the camera, completely eliminates hand-shake as an issue.

For additional shake elimination, learn how to use your camera's "mirror lock-up" feature that temporarily prevents your camera's mirror from moving during the shot.

- Extension rings: Also for macro lovers, extension rings are simply hollow metal tubes that lie between your camera and your lens (i.e. they attach to your camera where the lens goes and then the lens is attached to them).

By pushing the lens further away from the camera's sensor, the focal length is artificially increased which increases the magnification of your subject. Because such tubes are hollow, no additional piece of glass gets in the way to degrade your image quality.

- Light meter: These portable devices are more accurate than a camera's built-in light meter at measuring the amount of light coming from the scene. In addition, unlike a camera's built-in meter that can only measure light that is either reflected off a subject or that comes directly from a light source, a portable light meter can also be used to measure what is known as "incident light", this being the light actually falling on the scene. This is done by holding the light meter in the scene and pointing it toward the camera's shooting location.

After measuring the amount of light, a light meter then indicates what combination of aperture and shutter speed will provide the ideal exposure settings for those lighting conditions. A good one will set you back about \$500.

Making Prints of Your Photos

Your photos cannot be blown up to any size you wish because the number of pixels required for a crisp image increases as the size of your desired print increases. With insufficient pixels a photo appears blotchy and the individual pixels become evident and no longer blend seamlessly together, this being referred to as a “pixelated” image.

To make things even more complicated, all pixels are not created equal! A cell phone camera may have the same number of megapixels as a high-end DSLR, but with a sensor that is miniscule compared to that inside the DSLR, its image quality is not going to be able to compete.

In other words, there is a reason why top-end digital cameras sell for \$4,000 even though they have the same megapixel count as those selling for \$400 – their bigger sensors have bigger pixels and therefore produce superior images. So, megapixel count alone is only a very rough guide to how large a photo can be printed at a reasonable level of quality. Nothing can beat actual print experience with your own camera.

The ability of a photo printer to reproduce a digital image must also be taken into account. Most print at a resolution of 300 dots per inch (dpi). If we think of each dot as a pixel, this means that the following number of megapixels would be required for a given sized photo:

$4'' \times 6'' = (4'' \times 300 \text{ dpi}) \times (6'' \times 300 \text{ dpi}) = 2,160,000 \text{ pixels} = 2.16 \text{ megapixels or } 2.16 \text{ MP}$

$8'' \times 10'' = (8'' \times 300 \text{ dpi}) \times (10'' \times 300 \text{ dpi}) = 7.2 \text{ MP}$

$12'' \times 18'' = 19.4 \text{ MP}$

$20'' \times 30'' = 54 \text{ MP}$

On the face of it, this would seem to indicate that prints larger than 12x18 would be outside the limits of most consumer-level cameras that typically top-out at about 20MP. However, another factor impacting the perceived visual quality of a printed photo is how far away a viewer would typically stand from it to take it in. A small print requires a viewer to move closer to it relative to a larger print for their eyes to properly register its details.

The larger a photographic print (or painting for that matter) the further away a viewer typically stands. Because the ability of the human eye to discern detail falls off as distance increases, the number of megapixels required to achieve what the eye perceives to be a suitably crisp image is less than the above calculations would otherwise indicate.

A rough guide is to divide the indicated number of megapixels from the formula discussed above by the typical viewing distance for a given print size. This translates into the following rough megapixel guide:

Megapixels Required for Given Print Sizes

| Print Size (Inches) | Calculated Minimum Megapixels | Typical Viewing Distance (Feet) | Adjusted Minimum Megapixels Required |
|---------------------|-------------------------------|---------------------------------|--------------------------------------|
| 4 x 6 | 2.16 | 1 | 2.2 |
| 8 x 10 | 7.2 | 2 | 3.6 |
| 12 x 18 | 19.4 | 4 | 4.9 |
| 20 x 30 | 54 | 7 | 7.7 |

Appendix A: More Tips on Creating Compelling Photos

- Ask yourself, what is it about the scene that attracts your eye? How can you best emphasize those factors?
- Use the **SEB** technique prior to every shot:
 - **Simplify** to the main elements.
 - **Exclude** non-essential elements.
 - **Balance** what's left. Repeat until you get the strongest, simplest possible image - *then* take the shot.
- A good photo feels balanced. For example, a large single object on the right side is balanced by a cumulative collection of smaller objects on the left side.
- Don't 'break the frame' with an important element being cut off by the edge of the photo. It's okay to do so with lesser elements however.
- In post-processing, modestly darken the lesser portions of the scene and lighten the key portion as this makes them stand out. Darken corners to help draw eyes to the main elements. Photographer, [Ansel Adams](#), used to call this 'darkening the edges'.
- Eliminate all distracting elements.
- Get closer and closer to your subject to make the scene simpler and the image stronger.
- The more we include in an image the weaker it becomes. The less, the stronger.
- When searching for a suitable image to shoot, focus not on the subject or details but rather on basic forms and shapes, then move these around to make the strongest possible statement.
- See every object not as something with a name (e.g. that's a beach ball) but rather just as a shape to be balanced with other shapes.
- Once you've Simplified and Excluded, move around the key elements to get the best balance. Go right of the scene, left of the scene, above the scene, below the scene, behind the scene
- Composition is about basic organization of the key elements in your scene as they relate to each other.

- Composition is not about the subject matter. What draws us into a good image are the basic shapes, contrasts, and colours and their balanced arrangement.
- To find the best composition you need to move your position.
- You must be at the scene at the right time. You cannot expect to walk into an area and have perfect lighting. It can take several years of repeat visits to a spot to chance upon perfect lighting. Getting up before sunrise and being out with your camera around sunset certainly will help greatly.
- To get the best composition you must be prepared to climb on top of things, under things, roll around on the ground, and move in all three dimensions.
- Change the relative sizes of the key elements by moving closer or further away. Move objects around to your advantage if this is possible.
- Photographic composition is like interior design, each places key elements in space in a pleasing manner that is balanced.
- If you shoot and don't really know why you just took that shot, your photos are likely to be boring. Your reason must be more than, "My, that looks pretty!"
- Many of the best photographers went to art school where they learned about balance in painting and between light/dark, warm/cool, big/small, rhythm, pattern, line, curves, texture, etc. Composition is all about pleasing balance.
- In the West, eyes read from left to right and seek out the lightest or most contrasty areas of an image first, then explore from there. Don't let lines lead viewers' eyes out of the frame. Darken edges and lighten intended areas of interest.
- Defocus eyes before shooting to blur out distracting details and permit focus on the fundamental elements of the scene.
- Take a shot then try to simplify it to exclude distractions. Keep doing so until the best shot is achieved. Often this means getting closer and closer to the subject.
- All good photos are about shapes, light/dark, colours, and balance, NOT about the actual subject. Objects are simply shapes, lines, or blobs of colour.
- Look only for the boldest, broadest, most basic shapes and lines.
- Keep details out of the corners of the image. Keep corners dark to prevent viewers' eyes from wandering out of the image.

- Anything that is not directly helping the composition is taking away from it.
- Colours are harmonious when they are on opposite sides of the colour wheel, these being the direct opposites:

| | | |
|-------|--------|--------|
| RED | ORANGE | YELLOW |
| GREEN | BLUE | VIOLET |

- Warm colours (red, orange, yellow) appear to move toward a viewer. Cool colours (green, blue, violet) appear to recede from a viewer. Warm colours against cool colours give 'pop' to an image.
- If colour doesn't add to the image, shoot in B&W or convert to B&W.
- View the intended scene with one eye to remove the beauty attributable to seeing three-dimensionally as such beauty will disappear in a 2-dimensional photo. If a scene is boring with one eye, this means that you don't yet have a compelling composition.
- Steps to taking a good photo:
 - Spend more time seeking out a good image than fiddling with camera settings and equipment.
 - Find something that captures your attention.
 - Ask why it does. What *exactly* about the scene catches your eye?
 - Compose the image to emphasize these key factors (e.g. colour, texture, balance, perspective, lines, curves, contrast, shape, negative space, point of view, lighting, juxtaposition of shapes).
- It's never the subject that is key to an image but rather the compositional elements.
- It's not about your camera or your gear. [Henri Cartier-Bresson](#) used film camera, the same lens, no flash, and the same shutter speed – he didn't need the newest digital equipment or software to take great photos, and neither do you.
- Fewer lenses are better on a shoot as it forces you to view your surrounding in terms of that lens. Ideally take one fast fixed-focal-length lens on a shoot.
- Two lenses on a shoot could include these two zooms: 16 – 35 mm and 70 – 200mm.
- In the old days, cameras had only three settings: 1) Shutter speed. 2) Aperture. 3) Manual focus. Good photographers in the old days were still able to take great photos. Today's cameras have hundreds of settings, 99% of which are superfluous to good photography and serve more as a distraction than an aid.

- The best photos are often commonplace subjects composed in the simplest way. They are successful because they are limited to a single theme or idea and are organized without clutter.
- Successful photos rely on order and the elements that provide order are line, shape, form, texture, pattern, and colour.
- Filling the frame with the subject is often a successful strategy.
- Placing the subject in the upper right third of the frame is often more successful than placing it on the left.

"There's nothing worse than a sharp picture of a fuzzy idea"

Ansel Adams

Appendix B: Quotes from Photographers of Note

- A lot of photographers think that if they buy a better camera they'll be able to take better photographs. A better camera won't do a thing for you if you don't have anything in your head or in your heart. – [Arnold Newman](#)
- Beauty can be seen in all things, seeing and composing the beauty is what separates the snapshot from the photograph. – *Matt Hardy*
- Look and think before opening the shutter. The heart and mind are the true lens of the camera. – [Yousuf Karsh](#)
- I see something special and show it to the camera. The moment is held until someone sees it. Then it is theirs. – [Sam Abell](#)
- When words become unclear, I shall focus with photographs. When images become inadequate, I shall be content with silence. – [Ansel Adams](#)
- If you are out there shooting, things will happen for you. If you're not out there, you'll only hear about it. – [Jay Maisel](#)
- Light makes photography. Embrace light. Admire it. Love it. But above all, know light. Know it for all you are worth, and you will know the key to photography. – [George Eastman](#)
- Be daring, be different, be impractical, be anything that will assert integrity of purpose and imaginative vision against the play-it-safers, the creatures of the commonplace, the slaves of the ordinary. – [Cecil Beaton](#)
- When I was on trips I used to put Polaroids in a container with sea water, sand and pebbles. I'd swirl it all around to get scratches. It's this random element that I call 'the drip'. It's the drip which might splash onto the other side of the canvas when you're working on a painting and make you think 'that is good', possibly leading you to explore other things. My whole life is spent in search of the drip; it can change everything. – [David Bailey](#)
- Pick a theme and work it to exhaustion...the subject must be something you truly love or truly hate. – [Dorothea Lange](#)

- One doesn't stop seeing. One doesn't stop framing. It doesn't turn off and turn on. It's on all the time. – [Annie Leibovitz](#)
- Even though fixed in time, a photograph evokes as much feeling as that which comes from music or dance. Whatever the mode – from the snapshot to the decisive moment to multi-media montage – the intent and purpose of photography is to render in visual terms feelings and experiences that often elude the ability of words to describe. – [Ralph Gibson](#)
- Of course, there will always be those who look only at technique, who ask 'how', while others of a more curious nature will ask 'why'. Personally, I have always preferred inspiration to information. – [Man Ray](#)
- It is important to see what is invisible to others. – [Robert Frank](#)
- There is a creative fraction of a second when you are taking a picture. Your eye must see a composition or an expression that life itself offers you, and you must know with intuition when to click the camera. That is the moment the photographer is creative. Oop! The Moment! Once you miss it, it is gone forever. – [Henri Cartier-Bresson](#)
- A good photograph is one that communicates a fact, touches the heart and leaves the viewer a changed person for having seen it. It is, in a word, effective. – [Irving Penn](#)
- Which of my photographs is my favorite? The one I'm going to take tomorrow. – [Imogen Cunningham](#)

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